

Positive Educational Approaches to Teaching Effectiveness and Student Wellbeing

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POSITIVE EDUCATIONAL APPROACHES TO TEACHING EFFECTIVENESS AND STUDENT WELL-BEING

EDITED BY: Hans Henrik Knoop, Mirna Nel, Sufen Chen,
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POSITIVE EDUCATIONAL APPROACHES TO TEACHING EFFECTIVENESS AND STUDENT WELL-BEING

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Editorial: Positive Educational Approaches to Teaching Effectiveness and Student Well-being: Contemporary Approaches and Guidelines

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Editorial on the Research Topic

Positive educational approaches to teaching effectiveness and student well-being

Introduction

“In the thrall to content and qualifications, we have forgotten the deeper purpose of education. In the rush to make young people into successful exam passers, we have overlooked their deeper need to become successful people” (Claxton, 2008, p. ix). Positive education is a growing area of educational research that integrates elements of positive psychology with educational practices to promote the mental health and wellbeing of students as fundamental to student success (Seligman et al., 2009; Van Zyl et al., 2022). Positive education programs in schools encompass empirically validated and scientifically informed interventions, proactive strategies and systems thinking to enable a shared purpose toward student wellbeing (Kern et al., 2020; Van Zyl, 2021). Interest in positive education has increased over the past decade as the focus of academic success is no longer only on academic performance (Krifa et al., 2022). According to key international associations, education policy makers, teachers and parents should prioritize student mental health and help students maximize wellbeing (OECD, 2017; WHO and UNESCO, 2021). Positive education includes interventions from positive psychology that target student mental health and emphasize student

wellbeing as an essential educational outcome by promoting resilience, self-efficacy, strengths, capabilities, and other non-cognitive skills (International Positive Education Network, 2017; Halliday et al., 2020; Van Zyl et al., 2021; Van Zyl and Rothmann, 2022). Furthermore, the academic, financial, and health stressors arising from the COVID-19 pandemic (Krifa et al., 2021; Frenzel et al., 2022), and a growing social focus on diversity, equity, and inclusion (Govorova et al., 2020; Van Zyl and Salanova, 2022) highlight the need for ongoing positive education research on student wellbeing. This special issue/Research Topic identified current innovative approaches, tools, interventions, methodologies, models and guidelines in positive education.

Structure and contribution of the Research Topic

The manuscripts in this Research Topic, summarized in Table 1, are classified into three sections: review papers, survey design papers, and intervention papers.

Review papers

Chafouleas and Iovino present a conceptual review that a positive education approach must be embedded within a whole child, school, and community lens to advance equity in schools. Such an approach is theory-driven with explicit integration across bodies of science. The authors first provide a brief overview of schools as a context to serve as assets or risks to equity, followed by a discussion of theory and science using a whole child, whole school, and whole community lens. They contend positive education will advance equity when grounded in integrated theory and science across developmental systems theory, prevention science, ecological systems theory, and implementation science.

The review paper by Iovino et al. presents results from among 35 papers on evidence-informed strategies that can be used in schools to promote positive feelings in the moment and build coping behaviors that facilitate tolerance of uncertainty. They focus on those strategies that educators can easily and routinely use across ages, stages, and activities. Selected strategies are primarily tied to cognitive behavioral theory, broadly organized across categories of self-awareness, self-soothing, and social relationships.

The large-scale review by Waters and Loton of 98,571 abstracts from 35 specific journals targeting positive psychology across a 112-year period used computer-aided linguistic analysis and human coding to track the presence of positive education terms. Results of computer-generated linguistic work count analysis identified wellbeing, satisfaction, and the word stems motivate and engage as the most prevalent terms since 2009. In-depth human coding of a subset of positive education abstracts

($n = 2,805$) by a team of five researchers enabled to identify trends pertaining to how positive education research has been conducted in terms of paradigms, designs, methods, tools, samples, and settings from 1950 to 2016. College students and students in secondary school make up the most common samples, with little research in the early childhood years. Quantitative, cross-sectional studies using self-report surveys have been the most common design and method used over the past six decades, suggesting room for growth in qualitative methods and the need for greater longitudinal and intervention designs. The human coding was also used to classify positive education variables into broader categories of research. Nine categories were identified: positive functioning; wellbeing; ill-being; strengths; agency; connection and belonging; identity and personality; school climate and outcomes; and demographics.

Survey design papers

In exploring the psychological wellbeing of two cohorts of undergraduate and graduate students in France ($N = 48$) using a mixed methods approach, Baatouche et al. combined qualitative interpretative phenomenological analysis (IPA) interview data on lived experiences with quantitative survey data on the meaning of life and the meaning of education. Results suggest seeking the meaning of an education through reflective guidance will increase students' sense of psychological wellbeing by promoting more authentic choices.

Chhajer and Chaudhry focused on thriving, and its critical role in sustaining physical health, positive workplace behavior and wellbeing in 512 Indian management students across five survey design studies. Results found thriving was positively related to decision-making discretion (DMD), broad information sharing (BIS), and climate of trust (COT), with the competence dimension of self-determination theory (SDT) acting as a mediating variable.

Survey data from 889 U.S. and 181 South African undergraduates were analyzed in Donohue and Bornman investigation of the relationship between perceived quality of instruction (PQI) and academic wellbeing as moderated by household income and the cultural value of power distance (PD). Results of regression analysis found PQI is a positive predictor of academic wellbeing for U.S. students regardless of income and PD; students from South Africa were found to have higher wellbeing when they had low PD, regardless of income when PQI was low, but low PD did not associate with academic wellbeing when PQI was high if students were middle- or high-income.

In the study by Li et al., a cross-sectional survey design was conducted in 3,511 medical students from medical colleges in the Harbin, Jiamusi, Mudanjiang, and Qiqihar regions of China. Results of linear regression found medical students' mastery goals were negatively associated with academic stress and positively related to learning adaptability, sleep quality, and

TABLE 1 Summary of contributions to the Research Topic.

No	Author	Title	Purpose	Views	Citations
Review papers					
1	Chafouleas and Iovino	Engaging a Whole Child, School, and Community Lens in Positive Education to Advance Equity in Schools	The aim of this review paper was to frame a positive education approach as necessary to advance equitable opportunities in education due to its integration of (a) developmental systems theory, (b) prevention science, (c) ecological systems theory, and (d) implementation science.	5,440	3
2	Iovino et al.	Teaching Simple Strategies to Foster Emotional Well-Being	The aim of this paper was to identify strategies used in cognitive behavioral therapy (CBT) interventions that can be proactively and easily used in schools to promote emotional wellbeing (EWB) in youth who may be experiencing anxiety and depression. The identified strategies were self-awareness, self-soothing, and social relationships.	3,920	0
3	Waters and Loton	Tracing the Growth, Gaps, and Characteristics in Positive Education Science: a Long-Term, Large-Scale Review of the Field	This large-scale quantitative review used publication data to track the presence of positive education terms over a 100+ year period across 35 psychology journals and education journals utilizing two analytical methods.	3,239	3
Survey design papers					
4	Baatouche et al.	Meaning of Education and Wellbeing: understanding and Preventing the Risk of Loss of Meaning in Students	The aim of this paper was to analyze and understand, from an existential perspective, the psychological resources that students can activate in order to attribute meaning to their training.	978	0
5	Chhajer and Chaudhry	What Makes Indian Management Students Thrive? Role of Decision-Making Discretion, Broad Information Sharing, and Climate of Trust	This paper examines (a) the relationship of decision-making discretion, broad information sharing and climate of trust with thriving, and (b) the role of self-determination theory in determining this relationship.	808	0
6	Donohue and Bornman	Academic Well-Being in Higher Education: a Cross-Country Analysis of the Relationship Between Perceptions of Instruction and Academic Well-Being	The purpose of this research was to explore the relationship between U.S. and South African university students' perceptions of the overall quality of instruction (PQI) they experienced since COVID-19 and their academic wellbeing.	844	0
7	Li et al.	The Association Among Achievement Goal Orientations, Academic Performance, and Academic Wellbeing Among Chinese Medical Students: A Cross-Sectional Study	This study aimed to explore the status of achievement goal orientations among medical students in China and to further identify the association among academic performance, academic wellbeing, and achievement goal orientations.	2,125	2
8	Lillard et al.	An Association Between Montessori Education in Childhood and Adult Wellbeing	The study aimed to evaluate the Montessori pedagogy as a means to enhance wellbeing contemporaneously and predictively, including self-determination, meaningful activities, and social stability.	11,925	4
9	Moosa and Bekker	Working Online During COVID-19: Accounts of First Year Students Experiences and Well-Being	The aim of this paper is to explore how inclusive policy, practice and culture at one public South African university supported students' wellness while learning online during emergency remote learning.	1,181	0

(Continued)

TABLE 1 (Continued)

No	Author	Title	Purpose	Views	Citations
Review papers					
10	Utvær et al.	Nursing Students' Emotional State and Perceived Competence During the COVID-19 Pandemic: the Vital Role of Teacher and Peer Support	The aim of this study was to investigate the associations between peer support, teacher support, emotional state, and perceived competence in nursing students during the pandemic.	2,480	0
11	van Dijk et al.	Experiences of Clinical Clerkship Students With Mindfulness-Based Stress Reduction: a Qualitative Study on Long-Term Effects	The purpose of this study was to explore the mindfulness practice, its long-term effects, facilitators and barriers, in clinical clerkship students 2 years after participation in an 8-week mindfulness-based stress reduction (MBSR) training.	908	1
12	Van Tonder et al.	Enabling Self-Directed Academic and Personal Wellbeing Through Cognitive Education	The aim of this study was to explore the effectiveness of an intervention initiative that exposes teachers to foregrounding Cognitive Education to establish the latent potential of the intervention for assisting learners to develop self-regulating abilities that progressively inspires increased self-directed action.	1,449	0
13	White et al.	Unintended Positive Consequences of Development Centers in University Graduates	The aim of this study was to identify whether the generalized self-efficacy of graduates can be positively affected by a development center approach in the short-term and long-term.	841	0
14	Zalazar-Jaime et al.	Contribution of Academic Satisfaction Judgments to Subjective Well-Being	This paper examined the contribution of academic satisfaction (AS) judgments on subjective wellbeing (SWB) in university students.	430	0
Intervention papers					
15	Berg et al.	The Development of Teachers' and Their Students' Social and Emotional Learning During the "Learning to Be Project"-Training Course in Five European Countries	The present study evaluates teachers' and their students' readiness for social and emotional learning (SEL) during an intervention providing teachers' with skills to teach and assess social and emotional learning in the classroom in five European countries.	3,364	2
16	Zaharia et al.	Proof of Concept: a Brief Psycho-Educational Training Program to Increase the Use of Positive Emotion Regulation Strategies in Individuals With Autism Spectrum Disorder	The present study aimed at testing the practical potential and the preliminary effects of a brief novel psycho-educational training program on positive emotion regulation for individuals with autism spectrum disorders.	1,758	0

subjective wellbeing. A harmonious competitive environment for medical students to improve their academic wellbeing and performance by boosting positive achievement goal orientations is recommended.

Lillard et al. surveyed 834 students who attended at least 2 years of Montessori schools and 1,071 students who attended conventional schools in US and Canada (current mean age of participants was 37 years). Results of structural equation modeling found attending Montessori for at least two childhood years was associated with significantly higher adult wellbeing in terms of general wellbeing, engagement, social trust, and self-confidence.

Moosa and Bekker used a phenomenological qualitative approach to explore the lived experiences of 187 first year South African university students while working online during the COVID-19 pandemic through written responses to four open ended questions. Results highlighted that online learning had a negative effect on student overall spiritual, physical, emotional and social wellness.

The study by Utvær et al. investigated the associations between peer support, teacher support, wellbeing, and perceived competence in 329 nursing students at a large university in Norway during the pandemic. Results of structural equation modeling found that teacher and peer support are significant to nursing students' emotional states and perceived competence.

In the van Dijk et al. study, thematic analysis of interview data from 16 clinical clerkship students from the Radboudumc in Nijmegen, Netherlands 2 years after participation in an 8-week mindfulness-based stress reduction (MBSR) training found interviewees were still engaged in (mostly informal) mindfulness practice contributing to both personal and professional changes. In light of the high clerkship demands, MBSR training could be a valuable addition to medical curricula, supporting medical students in developing necessary competencies to become well-balanced professionals.

Van Tonder et al. explored interview data from 17 pre-school and primary teachers from public and private schools in South Africa who completed an 80-h strengths-based cognitive education intervention. Results found the intervention holds benefits for equipping teachers with teaching strategies to create classroom conditions that nurture the development of thinking skills and dispositions that are important for self-regulating, and ultimately self-directing academic and personal wellbeing.

The study by White et al. combined self-report survey and interview data from 17 industrial psychology graduate students at a select university in the Western Cape, South Africa, to investigate the effect of a development center-based competency assessment intervention on self-efficacy. Results found a positive increase in the general self-efficacy levels of graduates who completed the intervention. This effect was maintained at 3-month follow up testing.

Finally, Zalazar-Jaime et al. analyzed survey data on academic satisfaction (AS), life satisfaction, positive/negative emotions and subjective wellbeing (SWB), from 326 university

students (mean age 22 years). Results of structural equation modeling found the positive effects of AS on SWB are partially mediated by life satisfaction judgments and a balance of positive/negative emotions.

Intervention papers

The study by Berg et al. evaluated the efficacy of an experimental project called "Learning to Be: Development of Practices and Methodologies for Assessing Social, Emotional and Health Skills within Education Systems" which brought together education authorities, teaching practitioners and researchers from seven European countries: Finland, Italy, Latvia, Lithuania, Portugal, Slovenia, and Spain. The intervention group consisted of 243 teachers and 2,552 students; the comparison group consisted of 159 teachers and 1,730 students. Results of repeated measures ANOVA found no effect in teachers for the SEL intervention, however, the younger students (8–11 years) were found to have improved self-management skills that were more difficult for the teenagers (12–15 years). This may indicate that positive education interventions should be started before the stormy phase of puberty.

In the study by Zaharia et al., thirty male participants with autism spectrum disorder (aged 10–35 years; training group = 14, waitlist group = 16) underwent a three-session program on the use of adaptive positive emotion regulation (ER) strategies (i.e., attentional deployment, cognitive change, and response modulation). Results of repeated measures MANOVAs and multilevel modeling found the training group showed a significant increase in the self-reported use of the ER strategies compared to the waitlist group. The increase in the use of ER strategies maintained up to 7 weeks in the overall sample. Having reached high satisfaction rates and the intended effects in this proof of concept study, this novel program represents a promising tool to support ER. Future research should next investigate the efficacy of the intervention on day-to-day emotional experience and wellbeing.

Conclusion

Research supporting students' wellbeing and academic success are closely linked (Dix et al., 2020; Van Zyl et al., 2022), suggesting the importance of fostering wellbeing in the educational context (Ciarrochi et al., 2016; OECD, 2017; Govorova et al., 2020). The manuscripts featured in this Frontiers Research Topic show the many avenues of positive education for the development of positive psychology interventions within educational settings designed to increase student wellbeing and success. Specifically, the papers presented how positive education can enable wellbeing from a sustained whole child, school, community, and equitable lens. As schools

transition to a post-COVID world, future research should continue to study these avenues of positive education for building wellbeing in all students.

Author contributions

MC drafted the first version of the editorial. LZ and RS revised the manuscript. All authors provided input and accepted the final version of the manuscript.

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The Association Among Achievement Goal Orientations, Academic Performance, and Academic Well-Being Among Chinese Medical Students: A Cross-Sectional Study

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Learning motivation is a significant factor that ensures quality in medical education, and might affect the academic performance and well-being of medical students. This study aimed to explore the status of achievement goal orientations among medical students in China and to further identify the association among academic performance, academic well-being, and achievement goal orientations. Data were collected through a cross-sectional, anonymous survey conducted with 3,511 respondents (effective response rate = 81.7%), from four medical universities in China, and demographic factors, achievement goal orientations, academic performance, and academic well-being were assessed. The average score of achievement goal orientations of Chinese medical students suggested a difference in demographic factors, including sex, year of study, experience of leadership cadre, and family income. Both mastery and performance-avoidance goals were associated with academic performance, subjective academic stress, subjective learning adaptability, subjective sleep quality, and subjective well-being. Performance-approach goals were related to academic performance, subjective academic stress, and subjective learning adaptability. The achievement goal orientations of the medical students in this study were at a middle level. The findings emphasize the importance of mastery goals for promoting the academic performance and well-being of medical students. More care and attention toward achievement goal orientations can be beneficial for the improvement of the academic performance and well-being among medical students.

Keywords: association, academic well-being, academic performance, achievement goal orientations, medical students

INTRODUCTION

Considered as motivators of human behavior, achievement goal orientations are defined as the subjective expression of individual pursuits (Nicholls, 1984), and are usually divided into three types— mastery goals (that is to develop ability), performance-approach goals (that is to prove ability), and performance-avoidance goals (that is to avoid incompetence;

Elliot and Harackiewicz, 1996). Achievement goal orientations have been widely discussed by scholars in recent decades (Tuominen-Soini et al., 2008; Hall et al., 2015; King and Mendoza, 2020; Sideridis, 2020). A considerable body of literature suggests that achievement goal orientations play an important role in promoting academic development among students, and it can enhance their engagement in and enjoyment of studying. Furthermore, it is beneficial as it alleviates psychological stress and promotes the use of active learning strategies, thus leading to high academic achievement (Daniels et al., 2008; Tuominen-Soini et al., 2008, 2012; Gonçalves et al., 2017). Achievement goal orientations are also inseparable from some emotional experiences, such as stress, anxiety, depression, and burnout (Daniels et al., 2008; Tuominen-Soini et al., 2012; Gonçalves et al., 2017). Undoubtedly, continuous attention should be given to achievement goal orientations.

Since the concept of achievement goal orientations was proposed, there have been many studies on junior middle school, high school, and ordinary college students; however, only a few studies have focused on medical students (Giota, 2006; Tian et al., 2017; King and Mendoza, 2020; You, 2021). In recent years, the learning motivation of medical students in China has been one of the main practical concerns (Youhao et al., 2019). Due to the vast curriculum content and high pressure to learn, medical students are prone to negative tendencies such as academic dishonesty and cynicism (Ahmadi et al., 2009). In China, medical students face demanding learning tasks and long study periods, which can easily lead to academic stress and affect their learning engagement and emotional experience (Hong et al., 2010; Jiali et al., 2019; Lew et al., 2019). In addition, the outcome expectation can be attached to a greater importance in the Chinese cultural context, which may cause learning motivation problems for medical students and affect their achievement goal orientations (Liu and Tein, 2005). Some studies have shown that the achievement goal orientations of Chinese medical students are more negative than those of general students (Kim et al., 1997; Liu et al., 2000; Swetlik and Franco, 2018; Chen et al., 2020). Therefore, we believe that the level of achievement goal orientations of Chinese medical students is worrying and deserves close attention.

Low academic performance is a frequent obstacle in medical students' careers as doctors, as it is a key index that reflects educational outcomes (Stinebrickner and Stinebrickner, 2007), which are closely related to students' learning motivation. Medical students have diverse learning motivations and motivational orientations influenced by individual factors, family factors, and school factors (Korpershoek et al., 2015). Those with mastery goals attempt to understand the topic at hand, gain knowledge, and improve their skills, whereas students with performance-approach goals are focused on outperforming others (Korpershoek et al., 2015). However, Giota (2006) considered that performance-approach goals may be more often linked to students' ability-related concerns such as anxiety and surface level strategy use, including lower levels of academic achievement. Research on Indian medical students showed that the work-avoidance type of goal orientation among the lower performing group may account for their lower performance scores when compared with the higher performing

group (Barkur et al., 2013). They believed that medical students with performance-avoidance goals hide themselves as they try to avoid engaging in any activity. Meanwhile, other studies demonstrated that achievement goal orientations have no impact on the academic performance among medical students (Tapola et al., 2014; Korpershoek et al., 2015; Schwinger et al., 2016). Unlike Western countries, the achievement goal orientation of Chinese students is unique, dynamic, and uncertain due to the excessive attention to academic achievements from both families and individuals (Zang and Carrasquillo, 1995; Yang and Zhou, 2008). Therefore, it is worthwhile to further explore the relationship between academic performance and achievement goal orientations in China. In addition, some scholars concluded that achievement goals are related to emotions and cognitions that not only contribute to effective learning, but are also generally linked with well-being (Kaplan and Maehr, 1999; Tuominen-Soini et al., 2008).

In addition to performance, academic well-being is as important as academic success. Medical universities face the challenge of creating an academic environment that motivates students to engage in rigorous learning without compromising their health and well-being (Noddings, 2010). The recent years have seen a surge of recognition regarding the importance of students' stress levels and emotional well-being (Noddings, 2010). Stress is a normal and healthy response to difficult negative learning events; however, some Chinese medical students excessively face negative emotional experiences such as depression or anxiety, and even develop suicidal tendencies (Jiali et al., 2019; Lew et al., 2019). Academic well-being is regarded as the emotional experience during students' learning activities and it can be perceived as an evaluation of the entire learning process (Jing and Yu, 2015; Yuting et al., 2020). Studies have revealed that academic well-being is significantly associated with learning motivation (Tian et al., 2017; Tuominen et al., 2020). Tuominen-Soini et al. (2008) reported that learning motivation associated with self-improvement and growth was positively related to various indices of students' well-being, whereas avoidance tendencies and concerns with demonstrating one's competence were linked to different types of adjustment problems. They believed that some students have a stronger tendency to validate their competence, which makes them more vulnerable to situations that potentially imply incompetence or otherwise pose a threat to their self-esteem. They also thought that students with avoidance tendencies were challenged by avoidance, having low persistence in the face of difficulty, and negative self-cognition when confronting obstacles, whereas an opposite pattern was observed for mastery-oriented students. Research on students in Finland from lower and upper secondary school showed that those in the mastery-oriented group displayed the most adaptive pattern of motivation, academic achievement, and well-being (Tuominen et al., 2020). Thus far, it has been difficult for academic circles to determine the relationship between achievement goal orientations and academic well-being in different cultural settings due to different measuring tools; however, it is certain that the association between achievement goal orientations and academic well-being among

medical students needs to be discussed using locally adapted measuring tools in China.

Goal of Study

We conducted a survey on medical students to evaluate the following— (1) the status of achievement goal orientations and its influencing factors and (2) the association among achievement goal orientations, academic performance, and academic well-being.

MATERIALS AND METHODS

Participants and Procedures

Considering the time-effectiveness, cost-effectiveness and accessibility (Chang and Vowles, 2013), a cross-sectional anonymous online survey was conducted from May to June 2019 in current study. The multistage stratified convenient sampling method was used to collect data among medical students. Firstly, the procedures of this study were reviewed and approved by the Ethics Committee of the Institutional Review Board of Harbin Medical University (ECHMU). According to the calculation method and standard requirements of the cross-sectional sample size from Zhou et al. (2017), the minimum sample size of this study was calculated to be 1,824 participants. Considering that the minimum response rate is 50%, the sample size of this study should be expanded to at least 3,648 participants. In order to further ensure the data quality, we finally determined the number of respondents to be 5,000 participants. Secondly, we contacted 4 teachers in charge of student affairs and the academic administrators as the original deliverers of the survey. Prior to the formal release of the questionnaire, we trained the original deliverers of the survey. After understanding the content and purpose of the survey, the original deliverers recruited potential and qualified medical students from four regions, including Harbin, Jiamusi, Mudanjiang, and Qiqihar. In each region, one medical college was hierarchically selected, totaling four medical colleges. The characteristics of the medical colleges differed

by size, academic programs, research performance, admission scores and number of medical students. In addition, different classes and grades were randomly selected in each university. Thirdly, the survey was conducted through the online survey platform “Questionnaire Star.” Once informed consent was obtained, a web page link to our questionnaire survey¹ was sent to each participant via mobile phone during students' spare time. Each participant is only allowed to reply once. The researchers monitored the collected questionnaires in real time through the platform of “Questionnaire Star” and used the platform to effectively manage the data. The senior investigators conduct quality control by checking the collected questionnaires daily. In the past, our team has successfully used this survey method to finish a series of studies (Zhang et al., 2018; Shi et al., 2021). The link was sent to 5,921 participants, and 4,297 questionnaires have been submitted successfully. Our final sample selection strictly adheres to exclusion criteria for data management and quality control. Finally, we collected 3,511 valid questionnaires with an effective rate of 81.7%, excluding incomplete answers, failed the quality control questions (such as how carefully you filled out the questionnaire) and questionnaires that took <8 min to answer (the minimum answering time was 8 min in the preliminary investigation). The inclusion criteria required the participants to be students at a medical college and to voluntarily and truthfully cooperate with the online questionnaire survey. The specific data acquisition process is showed in **Figure 1**.

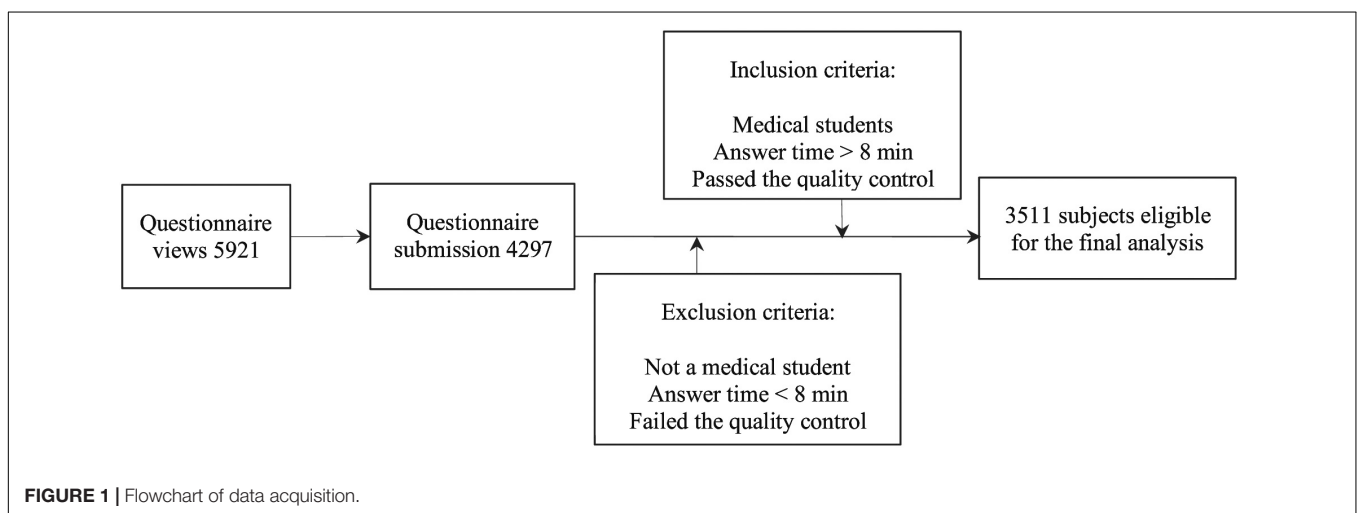
Study Instruments

A self-administered questionnaire consisting of demographic characteristics, achievement goal orientations, academic performance, and academic well-being was used, based on the objectives of this study.

Demographic Characteristics

Information on five demographic characteristics was collected from a self-designed questionnaire— sex, students' provenience,

¹<http://www.wenjuan.com/>



year of study, experience of leadership cadre, and family income. Students' provenience was divided into two categories: "rural" and "urban." The year of study was collected as a continuous variable, from 1 to 5. The leadership experience was divided into "student leaders" and "ordinary students." Options for family income included "≤¥5,000," "¥5,001–¥10,000," "¥10,001–¥20,000," and "≥¥20,001."

Achievement Goal Orientations

Achievement goal orientations were measured using the Chinese version of the Survey of Achievement Goal Orientations (SAGO; Elliot and Harackiewicz, 1996), which was translated by Wang et al. (Yanfei et al., 2011). The SAGO-13 consists of 13 items and three dimensions—mastery goals (four items), performance-approach goals (six items), and performance-avoidance goals (three items). Each item was scaled from 1 = *completely inconsistent* to 5 = *fully consistent*. In this study, the achievement goal orientation score was calculated by summing up the related questions ranging from 1 to 13. Higher values indicated higher levels of achievement goal orientation. Its reliability and validity have been tested among Chinese students by Wang (Dan, 2018). In this study, the Cronbach's alpha coefficients of the SAGO-13 were 0.752 (mastery goals), 0.864 (performance-approach goals), and 0.507 (performance-avoidance goals).

Academic Performance

The measurement of academic performance refers to the dimension of academic performance in the academic achievement scale developed by Wang et al. (Yanfei et al., 2011) which includes Chinese characteristics. The scale consists of four items—moral education, intellectual education, sports, and synthesis. The response format is a five-point Likert scale, ranging from 1 = *downstream level* to 5 = *upstream level*, where higher scores indicate higher academic performance. The Cronbach's alpha for the scale used in this study was 0.874.

Academic Well-Being

The term of well-being is commonly used but inconsistently defined in varied studies (Pollard and Lee, 2003). There are differences in the measurement dimensions of well-being among cross cultural backgrounds and characteristic subjects. The measurement of well-being is relatively diverse (Kim et al., 2016; Schütz et al., 2018; Strelhow et al., 2020). Combining the characteristics of academic well-being among medical students, we considered that a single item of subjective well-being cannot fully reflect the overall well-being of medical students. Thus, considering important aspects of the group characteristics among Chinese medical students, we included three items—sleep quality, academic stress, and learning adaptability, representing the physical, psychological, and social dimensions. The items were measured using a 10-point Likert-type scale, ranging from *very poor* to *perfect*. Previous studies have shown that the single item scales of academic stress (Azila-Gbette et al., 2015), sleep quality (Werneck et al., 2020), subjective well-being (Ashenfelter and Rouse, 1998), and learning adaptability (Tjin et al., 2018) have consistent reliability and validity.

Data Analysis

The participants' demographic standardized regression coefficients were expressed by (β) and (P) in each step of the regression model. The characteristics were reported as sample information. Pearson's correlation coefficients were calculated to estimate the correlations between achievement goal orientations, academic performance, and academic well-being. Descriptive statistics of the demographic and achievement goal orientations were indicated using the mean, standard deviation (SD), number (N), and percentage (%). Study variables were compared between sex groups, student source groups, year of study groups, experience of leadership cadres, and family monthly income groups by one-way ANOVA analyses. When the one-way ANOVAs were found to be significant, least-significant-difference tests (LSDs) were conducted for multiple comparisons. A multiple linear regression analysis was performed to examine the relationships between the variables. The Cronbach's alpha coefficient was used to measure the reliability of the measuring tools that we used. All the statistical analyses were performed using the IBM SPSS Statistics 22.0, and a two-tailed $P < 0.05$ was considered statistically significant.

RESULTS

Demographic Characteristics of Participants

The demographic characteristics of the participants included sex, provenience, year of study, experience of leadership cadre, and family monthly income. The percentage of participants who were female, urban, and student leaders were 66.0, 54.1, and 35.5%, respectively. Participants' years of study were 1 (30.8%), 2 (28.5%), 3 (22.7%), 4 (6.7%), and 5 (11.3%). The family monthly income levels of 41.8% of the participants were below ¥5,000, 48.5% had this level between ¥5,001–¥10,000, 9.0% had between ¥10,001–¥20,000, and 0.7% had a family income level above ¥20,001.

The Score of Achievement Goal Orientations Among Medical Students

The results indicated that the achievement goal orientations ($M = 3.57$, $SD = 0.58$) among medical students were at middle level. Other scores of achievement goal orientations, from highest to lowest included mastery goals ($M = 3.85$, $SD = 0.66$), performance-avoidance goals ($M = 3.48$, $SD = 0.74$), and performance-approach goals ($M = 3.42$, $SD = 0.80$), as presented in **Table 1**.

TABLE 1 | The Means, standard deviations (SD) score of achievement goal orientations among medical students ($n = 3511$).

Variable	$M \pm SD$	Min-Max
Achievement goal orientations	3.57 ± 0.58	1–5
Mastery goals	3.85 ± 0.66	1–5
Performance-approach goals	3.42 ± 0.80	1–5
Performance-avoidance goals	3.48 ± 0.74	1–5

The Difference Between Participants' Characteristics and Multiple Variables Scores

There was a significant difference in the scores on achievement goal orientations depending on students' demographics, including sex, year of study, experience of leadership cadre, and family income. A further pairwise comparison using the LSD method showed significantly different scores for mastery goals, performance-approach goals, performance-avoidance goals, and achievement goal orientations in year of study and family monthly income among medical students. The descriptive association between respondents' characteristics and mastery goals, performance-approach goals, performance-avoidance goals, and achievement goal orientation scores can be seen in **Table 2**.

Multiple Linear Regression Analysis Models

All the variables were significantly correlated with each other. Achievement goal orientations were positively related to academic performance ($r = 0.312, P < 0.01$) and academic

well-being ($r = 0.147, P < 0.01$). Therefore, a multiple linear regression analysis was performed to evaluate the influence of academic performance and well-being on the achievement goal orientations of medical students after eliminating the effects of the demographic variables. The results showed that mastery goals of medical students were positively associated with their academic performance ($\beta = 0.199, P < 0.01$), subjective learning adaptability ($\beta = 0.261, P < 0.01$), subjective sleep quality ($\beta = 0.090, P < 0.01$), and subjective well-being ($\beta = 0.178, P < 0.01$), and negatively related to their subjective academic stress ($\beta = -0.120, P < 0.01$). The performance-approach goals were positively correlated with academic performance ($\beta = 0.267, P < 0.01$) and subjective academic stress ($\beta = 0.118, P < 0.01$), and negatively associated with their subjective learning adaptability ($\beta = -0.040, P < 0.05$). The performance-avoidance goals were positively related to students' subjective academic stress ($\beta = 0.107, P < 0.01$), and negatively correlated with their academic performance ($\beta = -0.148, P < 0.01$), subjective learning adaptability ($\beta = -0.057, P < 0.01$), subjective sleep quality ($\beta = -0.051, P < 0.01$), and subjective well-being ($\beta = -0.051, P < 0.01$), as shown in **Table 3**.

TABLE 2 | One-way ANOVO analysis of mastery goals, performance-approach goals, performance-avoidance goals, and achievement goal orientations of medical students ($n = 3511$).

Variable		<i>n</i>	%	Mastery goals <i>M</i> ± <i>SD</i>	Performance-approach goals <i>M</i> ± <i>SD</i>	Performance-avoidance goals <i>M</i> ± <i>SD</i>	Achievement goal orientations <i>M</i> ± <i>SD</i>
Sex	Male	1,194	34.0	3.90 ± 0.69	3.46 ± 0.83	3.47 ± 0.79	3.60 ± 0.62
	Female	2,317	66.0	3.82 ± 0.65	3.40 ± 0.78	3.49 ± 0.71	3.55 ± 0.56
	<i>t</i>			3.476	2.072	-0.803	2.290
	<i>P</i>			0.001	0.038	0.422	0.022
Student source	Rural	1,612	45.9	3.84 ± 0.64	3.41 ± 0.77	3.48 ± 0.73	3.56 ± 0.57
	Urban	1,899	54.1	3.85 ± 0.68	3.43 ± 0.82	3.48 ± 0.75	3.57 ± 0.60
	<i>t</i>			-0.290	-0.503	-0.314	-0.512
	<i>P</i>			0.772	0.615	0.753	0.609
Year of study	①One	1,082	30.8	3.90 ± 0.64	3.53 ± 0.73	3.60 ± 0.70	3.66 ± 0.54
	②Two	1,001	28.5	3.86 ± 0.67	3.44 ± 0.82	3.45 ± 0.75	3.57 ± 0.59
	③Three	796	22.7	3.77 ± 0.69	3.30 ± 0.83	3.40 ± 0.76	3.47 ± 0.61
	④Four	235	6.7	3.81 ± 0.69	3.34 ± 0.80	3.35 ± 0.75	3.49 ± 0.59
	⑤Five	397	11.3	3.85 ± 0.63	3.36 ± 0.81	3.48 ± 0.73	3.54 ± 0.57
	<i>F</i>			4.848	11.331	11.536	14.549
	<i>P</i>			0.001	0	0	
LSD				①>②>③	①>②>③, ①>④, ①>⑤	①>⑤>④, ①>②, ①>③	①>②>③, ①>④, ①>⑤, ⑤>③
Experience of leadership cadre	Student leaders	1,245	35.5	3.94 ± 0.65	3.59 ± 0.77	3.46 ± 0.77	3.67 ± 0.59
	Ordinary students	2,266	64.5	3.80 ± 0.66	3.33 ± 0.79	3.49 ± 0.73	3.51 ± 0.57
	<i>t</i>			6.196	9.179	-1.438	7.527
	<i>P</i>			0	0	0.150	0
Family income (RMB)	① = 5,000	1,468	41.8	3.83 ± 0.65	3.39 ± 0.79	3.49 ± 0.74	3.55 ± 0.58
	②5,001–10,000	1,701	48.5	3.84 ± 0.66	3.43 ± 0.79	3.47 ± 0.74	3.57 ± 0.57
	③10,001–20,000	316	9.0	3.94 ± 0.71	3.50 ± 0.85	3.49 ± 0.76	3.63 ± 0.65
	④ = 20,001	26	0.7	4.11 ± 0.73	3.81 ± 0.88	3.51 ± 0.83	3.83 ± 0.65
	<i>F</i>			3.928	4.268	0.179	3.822
	<i>P</i>			0.008	0.005	0.911	0.010
LSD				④>①, ③>①, ④>②, ③>②	④>①, ③>①, ④>②		④>①, ③>①, ④>②

TABLE 3 | Regression analysis of achievement goal orientations to academic performance and academic well-being among medical students.

Variable	Academic performance		Academic well-being		
		Subjective academic stress	Subjective learning adaptability	Subjective sleep quality	Subjective well-being
Control variables					
Sex	0.070	-0.083	-0.002	0.096	0.056
Year of study	0.050	0.206	0.043	-0.002	-0.041
Student source	-0.017	0.013	0.017	0.045	0.019
Experience of leadership cadre	-0.186	-0.037	-0.107	-0.008	-0.046
Family income	0.032	-0.044	0.034	0.088	0.030
Predictor variables					
Mastery goals	0.199**	-0.120**	0.261**	0.090**	0.178**
Performance-approach goals	0.267**	0.118**	-0.040*	-0.004	-0.030
Performance-avoidance goals	-0.148**	0.107**	-0.057**	-0.051**	-0.051**
<i>F</i>	112.529**	37.752**	38.654**	13.130**	17.446**
<i>R</i> ²	0.204**	0.079**	0.081**	0.029**	0.038**
ΔR^2	0.138**	0.033**	0.060**	0.009**	0.029**

Note: **p* < 0.05, ***p* < 0.01.

DISCUSSION

Current Status of Achievement Goal Orientations Among Medical Students

This study investigated the status of achievement goal orientations among Chinese medical students. Our results showed that the mean score of achievement goal orientations among the participating medical students was 3.57 ± 0.58 (mean \pm SD). The mastery goal score was the highest and the performance-approach goal score was the lowest. The findings suggested that the achievement goal orientations of Chinese medical students were at a middle level, which was consistent with the scores reported by Niu (Weina, 2019), and should be of great concern. In fact, due to the particularities of the medical discipline, medical students tend to enhance their ability improvement (Xue et al., 2018). Moreover, medical students' mistakes occurring during clinical practice might threaten patients' safety and health, therefore, avoiding failure has become a common achievement goal orientation among medical students.

The Difference in Achievement Goal Orientations Across Various Socio-Demographic Factors

Among demographic factors, sex, year of study, experience of leadership cadre, and family income were found to have an impact on the achievement goal orientations of medical students. There are differences in the social roles between men and women, as men are more affected by perceived social pressure. Moreover, to maintain their self-realization and independence (Hui et al., 2018; Xiaozhou et al., 2019), men are likely to show positive goal orientations. Furthermore, compared with students from other disciplines or the general

population, medical students have higher admission scores for comprehensive quality and study enthusiasm before joining a medical university, which might contribute to the higher scores of achievement goal orientations. After entering the second university year, medical students have gradually adapted to university life. They pursue comprehensive ability development rather than a single achievement goal orientation during this learning stage. Once they encounter the internship stage in the third year, medical students face the requirements of heavy clinical skill operations and increased learning tasks. A learning environment with excessive stress and workload is likely to lead to negative emotions, which may decrease the level of mastery and performance-approach goals, and can even impair their mental health. Medical students in the fifth year experience various types of conflict stress resulting from the postgraduate entrance examination, medical practitioners examination, career choices, and graduating practices. During this stage, they tend to avoid failure in the examinations mentioned and make more efforts to learn, thus the performance-avoidance goals slightly increase. In fact, medical school teachers should provide different learning strategies for students of different sexes and years of study. As a previous study presented (Xue, 2019), medical students serving as leadership cadres need to organize daily activities, and they have higher abilities, responsibility, confidence, and willpower. Therefore, when facing difficulties and setbacks, they have higher endurance and resilience levels (Yanfei et al., 2011). Administrators should provide more opportunities for medical students to obtain the experience of leadership cadres, thereby helping more medical students to establish positive goals (King and Mendoza, 2020). In addition, medical students with low family income may experience more stress and anxiety in their studies and their lives. It is inevitable that their learning process is hindered by insufficient investment; thus, the scores of mastery and performance-approach goals are correspondingly lower. Medical students with family economic difficulties should

be provided additional economic and psychological support. Understanding the demographic factors of achievement goal orientation provides a comprehensive model for interventions and policies aimed to improve the achievement goal orientations of medical students.

The Association Between Achievement Goal Orientations and Academic Performance Among Medical Students

The results also revealed that medical students' mastery and performance-approach goals were positively associated with academic performance, while performance-avoidance goals were negatively related to academic performance, similarly to the findings of a previous study on university students in the United States (Alhadabi and Karpinski, 2019). As previous studies presented, medical students with mastery goals exhibit positive self-perception and adaptive behaviors (such as enthusiasm, persistence, interest, and effective learning strategies; Giota, 2006; Chan et al., 2012; King et al., 2012); thus, excellent academic performance can be achieved by them. According to the matching hypothesis proposed by Harackiewicz and Sansone (1991), goal effects depend on the general context in which goals are pursued (Barron and Harackiewicz, 2001). Parents and teachers who pay excessive attention to educational outcomes, in the Chinese context, might stimulate an increase in performance-approach goals and increase students' motivation to achieve higher performance levels. Medical students with a performance-approach goal orientation tend to focus on how to achieve better outcomes. This type of goal often allows the acquisition of skills in order to try to outdo others, to prove ability and superiority, and to pursue tasks with the intent of gaining a positive evaluation from others. Therefore, students with performance-approach goals may have a good academic performance. Some scholars have confirmed that performance-avoidance goals are positively associated with heavy burnout, negative learning attitudes, and low learning enthusiasm (Tuominen-Soini et al., 2012). Medical students with performance-avoidance goals also showed the most unsuitable pattern in academic performance and lower participation in university activities (Tuominen-Soini et al., 2008, 2012; Francisco et al., 2016). Moreover, medical students with avoidance tendencies exhibit negative self-perceptions and attitudes, effort withdrawal, and self-handicapping (SkaalviK, 1997). Thus, it can be said that students with performance-avoidance goals tend to have worse academic performance levels (Tapola and Niemivirta, 2008). As a result, mastery and performance-approach goals should be nurtured to improve the academic performance of medical students. However, there is a study showed that the COVID-2019 pandemic blockade has affected academic performance with varying degrees (Mahdy, 2020). But there is no relevant research on achievement goal orientations in this period. It is not possible to rule out whether the students' status of achievement goal orientations were influenced by their academic performance. Therefore, to foster positive achievement goal orientations in medical students, it is important to enhance their academic performance through problem-based learning,

case-based learning, self-directed learning, and conducting continuous assessments (Barkur et al., 2013).

The Association Between Achievement Goal Orientations and Academic Well-Being Among Medical Students

In this study, medical students' mastery goals were negatively associated with academic stress and positively related to learning adaptability, sleep quality, and subjective well-being. Surprisingly, medical students with performance-approach goals were positively correlated with academic stress and negatively associated with learning adaptability. Medical students' performance-avoidance goals were positively correlated with academic stress and negatively related to learning adaptability, sleep quality, and subjective well-being. These results were inconsistent with a previous study on adolescents in public middle schools in China (Tian et al., 2017), but were similarly to the findings of a previous study on students in compulsory school and upper-secondary school in Swedish (Bergh and Giota, 2020). The reasons for these discrepancies may be the differences in cultural backgrounds and research objects. In China, teachers and parents attached great importance to the education of students (Liu and Tein, 2005). Compared with other types of students, medical students are faced with more learning tasks (Jiali et al., 2019; Lew et al., 2019). Medical students with mastery goals have positive self-perceptions and participation consciousness (Tuominen-Soini et al., 2008, 2012; Gonçalves et al., 2017; Tuominen et al., 2020). Moreover, mastery goals are correlated with various positive and adaptive patterns of coping and affect (Daniels et al., 2008). Therefore, these students may experience less academic stress while having higher learning adaptability, sleep quality, and subjective well-being; however, medical students with performance-approach goals may pay too much attention to the goal and experience negative emotions such as anxiety, pressure, fear, and burnout (Tuominen-Soini et al., 2011; Zhang et al., 2016). This may lead to academic stress and a decline in learning adaptability. Those who adopt performance-avoidance goals are often correlated with negative emotional experiences and maladaptive outcomes such as stress, anxiety, hopelessness, and shame (Sideridis, 2005; Pekrun et al., 2006; Tapola and Niemivirta, 2008; Tuominen-Soini et al., 2008, 2012; Luo et al., 2011; Francisco et al., 2016). Hence, their academic stress is high, while the learning adaptability, sleep quality, and subjective well-being are low. It is likely that medical students with performance-approach goals who are exceedingly concerned with surpassing others and succeeding in school present negative cognition and emotion when faced with study difficulties, which might pose a further threat to academic well-being (Grant and Dweck, 2003). Medical students with performance-approach goals obtained better academic results more easily, even with a low level of academic well-being. Unfortunately, studies have shown that the pandemic of COVID-2019 had a significant impact on well-being among students (Li et al., 2020; Marques et al., 2021). But there is no relevant research on achievement goal orientations in this period. It is not possible to rule out whether they have a specific

achievement goal orientation due to their status of academic well-being. In addition to caring for the academic performance of medical students, more attention needs to be paid to academic well-being. The significant association between mastery goals and academic well-being should be taken into consideration when formulating solutions to increase the latter. Therefore, we should create a harmonious competitive environment for medical students to improve their academic well-being and performance by boosting positive achievement goal orientations (Eccles and Midgley, 1989).

LIMITATIONS

Although there are valuable discoveries, the present study has several limitations. First, a convenient sample was used as we recruited participants from four regions in the same province in China, which is very small compared to the Chinese medical student population and may limit the generalizability of the findings for other regions. Second, its cross-sectional nature prevented the establishment of a causal relationship between the variables. Therefore, an important suggestion is that similar longitudinal studies should be conducted in the future. Third, the choice to measure academic stress, learning adaptability, sleep quality, and subjective well-being using single items weakens the assessment and shortens the validity of the measurement tools. Besides, although a series of quality control measures were taken when we collected the data, the unsure deviations may exist caused by the online cross-sectional survey. Therefore, a rigorous sampling technique and a larger sample size are needed for a future study.

CONCLUSION

In summary, this study found that the achievement goal orientations of Chinese medical students are at a middle level. Mastery goals are positively associated with academic performance and well-being. Chinese medical students with performance-approach goals were positively related to academic performance and negatively correlated with academic well-being. Those with performance-avoidance goals were negatively associated with academic performance and well-being. Accordingly, medical students should be encouraged to achieve their mastery goals. In addition, medical students should be provided with more psychological and social support

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and be helped throughout their learning careers. Lastly, academic well-being interventions should be carried out to enhance the achievement goal orientations of the Chinese medical students.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The study was reviewed and approved by the Ethics Committee of the Institutional Review Board of Harbin Medical University (ECHMU). Due to the online survey approach, the written informed consent could not be received. Therefore, verbal informed consent for survey was approved by the ECHMU and obtained from each participant.

AUTHOR CONTRIBUTIONS

All authors made substantial contributions to the whole study. Q-IL and J-yZ came up with the idea and designed the study with the help of D-pC. JT and TS done the acquisition of data with help from C-xZ and H-cG. S-eZ entered the data into SPSS with the help from RG. Q-IL analyzed and interpreted the data with the help from L-yZ. S-eZ and L-bY conducted the focus group discussion. All authors contributed in preparation and submission of manuscript and, read and approved the final manuscript.

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The Development of Teachers' and Their Students' Social and Emotional Learning During the "Learning to Be Project"-Training Course in Five European Countries

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In recent years, the school curricula in many European countries have introduced social and emotional learning (SEL). This calls for the teachers to have SEL competencies. The present study evaluates teachers' and their students' readiness for SEL during an intervention in five European countries. The participants were teachers ($n = 402$) in five European countries; Italy, Latvia, Lithuania, Slovenia, and Spain. The pre- and post-measuring points for both the intervention and the comparison group were at approximately the same time before and after the intervention. Comparison data consisted of 159 teachers in the same countries. The training for the intervention group lasted 16 h for the teachers and a maximum of 16 h for the principals and headmasters. An additional 9 h of further monitoring took place. There were two student groups participating in the study: the age group of 8–11 years (pre puberty) and the age group of 12–15-years (adolescents). Students, whose teachers had participated in the intervention, formed the intervention group ($n = 2,552$). Those students, whose teachers did not participate in the intervention, formed the comparison group ($n = 1,730$). The questionnaire data were collected at the beginning and at the end of the school year for both age groups. The results indicated that there was a favorable development in the intervention group in some of the measured skills among students, but the effects were different for the two age groups. This study adds to both theoretical and practical development of continuing teacher training about SEL and its possible role in reducing problem behavior among the students.

Keywords: social and emotional learning, teacher training and development, social interaction skills, well-being, assessment, intervention

INTRODUCTION

In recent years educational policies decision makers worldwide have shown growing interest toward students' well-being as a facilitator of improved learning (Cohen, 2006; Durlak et al., 2011; Ashdown and Bernard, 2012; Zeidner et al., 2012; Taylor et al., 2017). For example, in council recommendations teaching and learning skills such as self-regulation and other social and emotional skills as a part of twenty-first century skills is seen as means to improve equality among EU-citizens (Council Recommendation of 22 May 2018 on Key Competences for Lifelong Learning Text With EEA Relevance, 2018).

There is some evidence about successful implementation of the international Social and Emotional Learning (SEL) programs to the national context (Talvio, 2014; Gol-Guven, 2016, 2017; Talvio et al., 2016; Cefai et al., 2018; Matischek-Jauk et al., 2018). However, a meta-study analyses on the effectiveness of SEL education programs points out difficulties in transferring educational practices and materials across different countries and stresses out the importance to examine cultural factors that influence the effectiveness of SEL education (Wiglesworth et al., 2016).

In addition to teachers' willingness and the manner with which teaching the SEL skills is transferred into practice, there may be other factors influencing the quality of the implementation in the school level. According to literature (Domitrovich et al., 2008; Humphrey, 2013) the teachers' willingness to implement the skills learned is much defined by how comfortable the teacher feels about implementing the new skills in action. The school climate including an implementation support system that may consist of peer tutoring, a monitoring system as well as leadership support has been reported to increase the fidelity of both the implementation as well as the sustainability of delivering SEL (Humphrey, 2013). Domitrovich et al. (2008) used a multi-level conceptual framework for describing the levels on which implementation quality may be enhanced. They point out that the school level includes components such as the school climate and culture, the resources available as well as the expertise of the staff. This also includes the teachers' possibilities for acquiring peer support for delivering SEL and sharing experiences of success and possible challenges in doing so. The individual level includes the teachers' attitudes toward SEL as well as their willingness and skills for implementing it in their classrooms. The fruitful environment for successful implementation of SEL also includes leadership support. According to Humphrey, support provided by school leadership is a crucial factor for both the sustainability as well as the adaptation of skills in the classroom surroundings.

Accordingly, as it may be worthwhile to pay attention to the quality of the intervention itself and on the implementation process, it may also be worthwhile to pay attention to the timing of the intervention. Some studies suggest that there are some typical SEL programs that work very well with children, but have a poor track record with middle adolescents (Yeager, 2017). The present study concentrates on two age groups of students. The younger group consisted of 8–11 year-old children in pre-puberty and the older group consisted of 12–15

year-old adolescents. These two groups are in developmentally different stages.

Literature shows that (Nolen-Hoeksema et al., 2014) pre puberty is a developmental stage where friendship and social relationships have a growing meaning and interest. They state that beginning from about age five, children develop a sense of obligation to follow the rules handed to them by their parents and teachers. At this age children enjoy games and play that includes agreeing on rules. They also typically look up at the parents and the teacher even though criticism toward adults gradually starts to emerge (Steinberg, 2010). Around the age of 8–9 the children aim at perceiving and understanding the outline of different rules and social schemas and they grow increasingly skilled at taking other people into consideration. Their moral thinking as well as and conscience develop under the guidance of adults and become internalized as personal guidelines (Kagan et al., 1987; Harris, 1995). Consequently, a teacher's toolkit that aims at assessing SEL may help the teacher to pay attention and to guide the students in developing skills for building healthy and ethical relationships at this developmental phase.

The next developmental phase takes place in adolescence at approximately the age of 12–17. At this phase the academic work becomes increasingly complex and demanding and human relations become less stable (Steinberg, 2010). At the same time, the capacity of their brain to process information about emotions undergoes a dramatic transformation (Blakemore and Mills, 2014). Larson et al. (2014) demonstrated that adolescents experienced wide and quick mood swings in this age, and suggested that these mood swings appear to be a natural part of an adolescent peer-oriented lifestyle rather than resulting from stress, lack of personal control or psychological or social maladjustment. They also state that there are indications that these adolescent mood variabilities interfere with capacity for deep involvement, especially in school. The beginning of puberty, which marks the adolescence, causes changes in brain structure as well as in the hormone activity. All these changes can make even minor social challenges, such as peer rejection, difficult to deal with. Consequently, in this age group the teacher's toolkit for assessing SEL may make the students painfully aware of their shortcomings in SEL; there may be a good will, but the regulation of emotions may be challenging. During adolescence, respecting adults may become unimportant and therefore accepting guidance in making changes in one's behavior may become difficult, and problem behavior may start to emerge (Steinberg, 2010). Competence of SEL may help in promoting positive adjustment and in reducing risk for problem behavior (Domitrovich et al., 2017).

Accordingly, school should promote social and emotional learning. Social and emotional skills are taught and learned both intentionally and imperceptibly from peers and teachers, who are both teaching the skills and acting as role models demonstrating the use of skills in action. Therefore, the teachers own skills in social and emotional learning are crucial when teaching the skills to her students (Ferreira et al., 2020). Our EU Erasmus+ project Learning to Be attempted to develop a toolkit with which it would be possible to examine different SEL assessment methodologies in practice in five different European countries. At the same

time one of the aims was to investigate first the possible changes in teachers' perceived importance and competence in SEL as well as the possible trend that would show an interrelation between perceived importance and competence in SEL and then during the next phase look at the possible transfer on the students. The aim was to develop a comprehensive and relevant model that would enable positive changes in education policies across Europe. The project aimed at highlighting the necessity to develop positive social and emotional skills among pupils by offering their teachers practical assessing solutions on how social and emotional learning could be integrated into existing education systems as well as providing policy recommendations for supporting social, emotional learning at schools. We also took into account that the challenges for the students in two age groups were different.

What Is Social and Emotional Learning

SEL is the process by which each student develops their capacity to integrate thought, emotion and behavior in order to achieve and accomplish important social tasks. In this sense, individuals develop skills that allow them to recognize, express and manage emotions, build healthy relationships, establish positive goals, and respond to personal and social needs (Lemerise and Arsenio, 2000; CASEL, 2005). SEL fosters the use of various cognitive and interpersonal skills to achieve relevant goals, both socially and developmentally (Zins et al., 2007). Research indicates that people with solid social and emotional skills are better able to cope with everyday challenges and benefit academically, professionally, and socially (Domitrovich et al., 2017). According to the CASEL (2005), SEL is composed by five key competences namely self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. Based on Weissberg et al. (2015), the SEL competences can be defined as: the ability to recognize one's emotions and thoughts and their influence on behavior (self-awareness); the ability to regulate one's emotions, thoughts, and behaviors in different situations (self-management); the ability to take the perspective of and empathize with others from diverse cultures and to understand social and ethical norms for behavior (social awareness); the ability to establish and keep healthy and rewarding relationships (relationship skills); the ability to make constructive and respectful choices about personal behavior and social interactions based on ethical standards, safety concerns, social norms, taking in consideration the well-being of self and others (responsible decision making). All these skills, when put in practice, help to promote well-being of both teachers and students, and enable their flourishing in the classroom (Talvi and Lonka, 2019). Social and emotional learning is thus the corner stone for positive development.

With the help of these skills one is capable of will nurturing more collective and cooperative behaviors, as well as decreasing behavior and communication problems, emotional tension, and developing effective problem solving, self-discipline, impulse control, and emotion management (Greenberg et al., 2003). SEL competences allow children to calm themselves when angry, make friends, resolve conflicts respectfully, and make ethical and safe choices (O'Brien and Resnik, 2009) and may

empower individuals to become more responsible and empathic, promoting a dynamic participation in society and citizenship (Lemerise and Arsenio, 2000). SEL is a critical component of the educational experience that leads to improvements in student behavior, reductions in classroom disruption, and greater academic achievement. It does so by going beyond traditional academic skills by teaching students how to resolve conflicts, handle emotions, empathize, and make responsible decisions (Elias et al., 1997; Greenberg et al., 2003).

SEL is a complex process with which children and adults acquire and utilize skills to interact with oneself and others in a constructive and confident manner. These critical competencies of SEL are necessary for maintaining successful relationships with others, gaining meaningful employment, routing daily life skills, and problem-solving issues that arise in life, particularly as one move toward adulthood and greater self-sufficiency and autonomy. Interventions designed to teach constructive interaction skills as well as social and emotional skills to teachers aim at teachers' greater ability to both teach the same skills to their students and act as an example in different kinds of interactional situations in the classroom. Consequently, as teachers' gain more constructive ways of handling conflicts and challenging behavior the amount of problem behavior in the classroom diminishes (Elias et al., 1997; Greenberg et al., 2003).

Teachers' Professional Development in SEL

With the view to developing a comprehensive model for the development and assessment of SEL skills, the goal of the Learning To Be-project was to develop and examine a set of innovative assessment methodologies in practice by conducting a number of field trials in schools in five partner countries. Further, evaluating the outcome of these assessment practices on the development of students' SEL skills and other learning outcomes (involvement in the community, motivation to learn etc.) was one of the core goals.

Research on teachers' SEL is still relatively scarce (Talvio, 2014). The lack of this research has been explained by the hypotheses that the development of teachers' skills is part of the tacit knowledge of the teaching profession (Elliott et al., 2011), or, that teachers' SEL develops as part of their role (Jennings and Greenberg, 2009). If it is suggested that teacher's SEL is best learned as part of their teaching practice, it follows that such knowledge may not be easily recognized or transmitted.

Some studies have investigated the benefits of SEL to teachers. Jennings and Greenberg (2009) found that teachers needed to spend less time on classroom management when SEL was effectively implemented in the classroom. Collie et al. (2012) found that beliefs about teachers' comfort in implementing SEL in the school settings results to the teacher higher levels of efficacy and personal accomplishment at the end of 1 year compared to the comparison sample. In addition, positive effects of the SEL workshops on school climate, student behaviors, and conflict resolution strategies have been reported (Collie et al., 2012; Gol-Guven, 2017). In addition, an Austrian longitudinal study found reduced bullying and fighting among the pupils whose teachers

had participated in the training on SEL compared to the control group (Matschek-Jauk et al., 2018). The same study also found that the higher the implementation level of SEL, the more positive effects were found.

In order to succeed not only in promoting SEL in classrooms but also, in transferring the skills to the students, teacher's knowledge of the content taught and how to apply it is important. The extent of how faithfully the principles and activities are replicated, how much of the content is delivered, and how effectively the students' other studies and background are considered, are dependent on instructor's competence (Talvio et al., 2013, 2015). Accordingly, teachers' own development of SEL is crucial in the successful implementation process (Peeters et al., 2014). Studies on teachers' development during the SEL intervention indicated that teachers' knowledge and SEL skills increased in the intervention group (Talvio et al., 2019). Teachers learned to develop their social interaction skills, such as expressing their feelings in constructive ways. In addition, their readiness to use skills increased, non-desired ways of interacting decreased, and the teachers started thinking about how to support their students' autonomy (Talvio et al., 2013). The decrease in non-desired ways of interacting included avoiding blaming or reproaching students and withdrawing from distributing punishments or rewards. Hence, teachers benefit SEL both directly and indirectly; when they learn the skills themselves and when they teach the skills to their students. It is therefore important to investigate the benefits of an intervention that aims at improving teacher's social and emotional skills on students' SEL.

Students' Social and Emotional Learning

Previous studies indicate that SEL increases students' chances of success in school and later life (Clarke et al., 2015; Weissberg et al., 2015). Elias et al. (1997) suggested that socio-emotional competence helps pupils to recognize and regulate their emotions effectively, communicate better with their peers and adults and form healthy and warm relationships with them. SEL is helpful also in meeting personal needs, setting realistic goals and making responsible decisions, all important elements for school motivation and school engagement (Greenberg and Jonas, 2003; Zins et al., 2004; Zins and Elias, 2007; O'Brien and Resnik, 2009).

However, the information about the effectiveness of the interventions is limited, as these interventions did not include a comparison group. Therefore, the benefits cannot be explained only because of the interventions (Corcoran et al., 2018). The meta-analysis of Taylor et al. (2017) was an exception focusing on SEL intervention studies with comparison conditions in school settings. It revealed statistically significant benefits of SEL for students including improved social and emotional skills and attitudes toward self, others, and school. In addition, SEL promoted pupils' prosocial behavioral and i.e., reduced conduct and internalizing problems. Positive effects on academic performance were found too.

Another problem according to Corcoran et al. (2018) is that there have been several reviews on the area of the benefits on SEL, but very few of them focus exclusively on SEL interventions. Most of them focuses, for example, on reducing bullying and

victimization (Farrington and Ttofi, 2009), investigating the benefits of the use of mindfulness in the classroom (Maynard et al., 2015) or reducing problem behaviors and delinquency (Piquero et al., 2010). In addition to these, research can be found about the role of gender in problem behavior and competence (Forehand et al., 1991) and about using SEL framework in the selection of prevention programs that address health, substance abuse, violence prevention, sexuality, character, and social skills (Payton et al., 2000). Reducing student problem behavior remains one of the leading concerns for school staff, as disruptive and aggressive behavior interferes with student achievement and even the school climate. Research (Spaulding et al., 2010) shows that problem behavior is most likely to be generated from classrooms and more likely to be related to peer-directed problem behavior in elementary schools, student-adult interactions in middle schools, and tardiness and truancy in high schools. Problem behavior in the present study is defined as *behavior that violates definitions of appropriate conduct and norms shared by the members of a social system* (Jessor, 1982). For students, it typically consists of behavioral patterns that are correlated with adverse social, psychological and physical consequences, such as substance abuse and physiological or psychological violence (Georges, 2009). Given the behavioral expectations in the classroom (e.g., sustained attention on task, motivation for individual studying and participating in cooperative or collaborative group work, etc.), bullying, substance abuse and truancy place children and adolescents at risk of not being able to live up to these expectations. Furthermore, continuing or repetitive breaking of the school rules brings both negative attention and feedback placing these children under the risk of negative development caused by a negative perception of one self and ones' abilities.

Aims

On one hand, national curricula frameworks all over Europe underline the importance of social and emotional skills in education. On the other hand, there has been a lack of awareness on how to assess social and emotional skills and how to integrate assessment strategies of these skills into the existing education practices. This project aimed at producing an intervention providing teachers' with skills to teach and assess social and emotional learning in the classroom.

The aim of this study was to look at the students' development of their SEL *per se* as a result of the effect of the intervention provided to their teachers in the school context. The design included two age groups: pre-puberty aged 8–11 year-old students and 12–15 year-old adolescents as both intervention groups and comparison groups to capture the effect of the SEL intervention as well as attempting to capture the most fruitful timing in terms of the age of the participating students in five European countries. Another aim was to look if there was a negative development in students' deviant behavior.

In this report the research questions are:

Does the *SEL competencies assessment practices* intervention developed in the Learning to Be-project have a positive desirable development in terms of:

- (1) Teachers' perceived readiness to implement SEL learning; This was operationalized by using the following variables: teachers' *perceptions of the importance* of teaching SEL and teachers' *perceptions of their competence* in teaching SEL
- (2) Students' SEL competencies and is there a difference between the two participating age groups (the group of 8–11 and 12–15)?
- (3) Reducing students' problem behavior—are the results different in the two age groups?

In this study also significances under 0.10 (10%) are presented in an attempt to capture the possible trends of development. However, only statistically significant results are discussed further.

METHODS

Context of the Study

This study is about an experimental project called “Learning to Be: Development of Practices and Methodologies for Assessing Social, Emotional and Health Skills within Education Systems” in the framework of Erasmus+ KA3 programme (582955-EPP-1-2016-2-LT-EPPKA3-PI-POLICY). The project brought together education authorities, teaching practitioners and researchers from seven European countries: Finland, Italy Latvia, Lithuania, Portugal, Slovenia, and Spain.

The Finnish research group was responsible for the independent evaluation. The interventions were carried out in Italy, Latvia, Lithuania, Slovenia, and Spain. Researchers from these countries helped to understand the cultural context, cross-translated the questionnaires and implemented the interventions. The contribution of Portugal was in participating in the design of the Toolkit providing the assessment tools used in the interventions in schools.

An intervention for teachers in primary and lower secondary schools was designed in an attempt to make SEL more visible in schools by proposing methods for teachers to assess students' progress and support their further learning. The intervention included a Toolkit (Agliati et al., 2020) for teachers. The Toolkit was created in co-operation with the participating institutes from the five European countries involved in the field trials. The manual for the Toolkit included: a theoretical introduction to SEL providing guidelines for consistent practice, descriptions of teaching methods, assessment tools for teachers and students and SEL learning standards that present learning objectives for two age groups of students. The Toolkit was translated to all five target languages, namely Italian, Latvian, Lithuanian, Slovenian, and Spanish languages. An additional translation to English language was also made.

Interventions at Schools

The toolkit was created as training material for the teachers who participated in the intervention. The length of the training provided for teachers in the intervention group was 16 h. The 2-day training programme was based on an experiential SEL methodology, modeling (practicing) the same methods for classroom learning, community involvement and assessment of

SEL skills that teachers were expected to transfer to their school life. The first part of the workshop focused on understanding SEL and discussing its implementation at school. The next 10-h programme was aimed at teachers, and focused on the practical parts of the Toolkit: learning methods to support SEL, strategies for creating a supportive social environment at school and formative assessment of SE skills. After the training, the experimental schools piloted the Toolkit in the classroom. The agreed duration of the pilot (intervention) continued for 5 months in each experimental school. Additionally, the country coordinators arranged an additional 9 h of monitoring in an attempt to reinforce the acquisition of skills, practices and knowledge gathered during the training as well as to gather data for qualitative research purposes. The length of the training for principals and head masters varied from 10 to 16 h. Despite the variation in the length of the training for the administration, both the pre-tests and the post-tests were conducted at approximately the same time in each of the participating countries. The pre-tests were carried out in September and October in 2018, and the posttests were carried out in May and June in 2019.

Participants

Data were collected from teachers and their students in five participating countries (Italy, Latvia, Lithuania, Slovenia, and Spain). The randomly selected schools for both intervention and comparison groups in each country were designated to represent typical schools in each target country, including both urban and rural schools having not participated in SEL interventions previously. Overall, the sample of the study intended to be as representative as possible aiming at exploring the average change in ordinary schools and in ordinary learning groups in each country. **Tables 1, 2** show the distribution of teachers and students per country.

Teachers

In order to be eligible for participation in the evaluation part of the project, teachers participating in the present study had to meet the following criteria: not participate in previous SEL training and work in either elementary or secondary school (or another national equivalent). In addition the intervention group teachers needed to participate in the training whereas the comparison group teachers did not participate in any SEL training during the time of the study. The comparison groups should be as similar as possible with the intervention groups.

Total research sample of teachers consisted of an *intervention group* ($n = 243$) who participated in the intervention and a *comparison group* ($n = 159$) who did not take part in the intervention. **Table 1** shows that the largest intervention group of teachers was from Latvia ($n = 61$) and the smallest from Slovenia ($n = 33$). The largest comparison group of teachers was from Spain ($n = 41$) and smallest from Slovenia ($n = 11$). Participants in both intervention and comparison groups were selected by the national research coordinator from randomly selected schools. Educators had to be schoolteachers or other personnel directly involved in educational work with children in the school community e.g., social workers/educators, school psychologists, educators of non-formal learning programs (art/sports groups,

TABLE 1 | Number of teachers according to gender in all participating countries and in total.

G	Italy				Latvia				Lithuania				Slovenia				Spain				Total			
	<i>n</i> = 84				<i>n</i> = 92				<i>n</i> = 105				<i>n</i> = 44				<i>n</i> = 84				<i>n</i> = 409			
	Int		Comp		Int		Comp		Int		Comp		Int		Comp		Int		Comp		Int		Comp	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
F	38	84	37	95	57	93	27	87	61	90	37	100	26	79	10	91	29	67	28	68	211	87	139	87.4
M	0	0	2	5.1	3	4.9	2	6.5	5	7.4	0	0	4	12	1	9.1	13	30	13	32	25	10	18	11.3
D	6	16	0	0	1	1.6	2	6.5	2	2.9	0	0	3	9.1	0	0	1	2.3	0	0	16	6.6	2	1.3
T	45	100	39	100	61	100	31	100	68	100	37	100	33	100	11	100	43	100	41	100	243	100	159	100

The number of teachers in each country consists of those who participated in both pre-test and post-test.

G, gender; F, female; M, male; D, do not wish to tell; T, total.

TABLE 2 | Characteristics of the teachers of the intervention and comparison groups.

	Intervention group	Comparison group
Teacher position in the community	(<i>n</i> = 675)	(<i>n</i> = 287)
Subject matter teachers	331 (48.3%)	199 (50.8%)
Class teachers	273 (39.9%)	145 (37%)
Special needs teachers	16 (2.3%)	13 (3.3%)
Other	55 (8.0%)	30 (7.7%)
Missing	10 (1.5%)	5 (1.7%)
Gender	(<i>n</i> = 674)	(<i>n</i> = 387)
Female	580 (84.7%)	339 (86.5%)
Male	70 (10.2%)	39 (9.9%)
Did not tell	24 (3.5%)	9 (2.3%)
Missing	11 (1.6%)	5 (1.3%)
Average age	(<i>n</i> = 642)	(<i>n</i> = 374)
	46.8 years	45.7 years
Average experience in years	21.7 years	21.0 years
Minimum	0	0
Maximum	47 years	58 years

community, and youth organizations etc.). Despite the possibility for other personnel working in the field of education being eligible to participate, all the participants were teachers.

The difference in background information were compared to report the possible differences between the intervention and the comparison groups as well as between genders in each country by using Chi-square test. **Table 1** shows the total number of teachers who participated in both the pre- and the post-test (*n* = 402) and also that there was a significant difference in the number of male and female teachers.

The characteristics of the participants (e.g., type of teacher, gender, age, and average experience in years) were quite similar in the intervention and comparison groups. For detailed information see **Table 2**.

Students

The students were grouped into two age groups: 8–11-years old (pre puberty) and 12–15-years old (adolescents). **Table 3**

shows the exact numbers of students and their gender in both age groups in each country. Students whose teachers had participated in the intervention belonged to the intervention group. Those students whose teachers had not participated in the intervention group belonged to the comparison group. In an attempt to ensure all members of the learning groups were provided the possibility for participating in the research, additional translations were made for minority language groups in some of the participating countries.

Students' Intervention Group

Total research sample of students' intervention group consisted of 203–986 students depending on the country. Altogether 2,552 students (see **Table 3**). In order to be eligible for participation in the evaluation part of the project participants had to meet the following criteria: age between 9–11 (group 1) and 13–15 years old (group 2). These age groups were selected based on a fact that generally education is compulsory until 16 years old. The *Students' comparison group* consisted of 93–492 students depending on the participating country, altogether 1,730 students (see **Table 3**). In order to be eligible for participation in the evaluation part of the project the participants had to meet the following criteria: age between 9–11 and 13–15 years old. In this group, there were also students who reported to be 8 or 12 years old and due to their upcoming birthday, the age groups were widened to 8–11 and 12–15.

Table 3 shows the number of participating students in both pre-test and post-test. This study focuses on the group of students who attended both pre- and post-tests because in this group of students it is possible to investigate their development in SEL.

Data Collection

Data from teachers and students were collected before (pre-test) the intervention. It was collected from both intervention and comparison groups at the beginning of the school year in September. Participants filling in the electric questionnaire were informed that their information and responses would remain anonymous. Participants were also informed about the possibility of withdrawing their responses from this study at any time without warning or explanation in advance.

TABLE 3 | Students' distribution as a function of age and gender across countries.

Country	Age group	Only pre-test (n = 305)												Both pre-test and post-test (n = 1,521)															
		int (n = 202)						com (n = 103)						int (n = 986)						com (n = 535)									
		g	%	b	%	d	%	tot	g	%	b	%	d	%	tot	g	%	b	%	d	%	tot	g	%	b	%	d	%	tot
Italy (n = 1,826)	8–11	47	40	63	53	7	0	117	15	31	28	57	6	12	49	234	50	208	45	25	5	467	145	54	117	43	9	3	271
	12–15	40	47	38	45	7	8	85	15	28	38	70	1	2	54	186	36	325	63	8	2	519	117	44	138	52	9	3	264
Latvia (n = 1,826)	8–11	53	41	73	57	3	2	129	45	43	56	54	3	3	104	187	50	172	46	13	3	372	126	55	100	43	4	2	230
	12–15	83	42	106	54	9	5	198	79	41	106	55	8	4	193	183	55	134	40	15	5	332	131	50	116	44	15	6	262
Lithuania (n = 1,216)	8–11	42	45	50	53	2	2	94	82	54	62	41	7	5	151	85	49	82	47	8	5	175	91	47	94	48	9	5	194
	12–15	42	47	45	51	2	2	89	70	53	59	44	4	3	133	121	59	76	37	7	3	204	97	55	76	43	3	2	176
Slovenia (n = 567)	8–11	13	37	18	51	4	11	35	45	38	54	45	#	17	119	83	53	70	44	5	3	158	18	34	25	47	10	19	53
	12–15	37	64	18	31	3	5	58	26	44	26	44	7	12	59	23	51	22	49	0	0	45	24	60	16	40	0	0	40
Spain (n = 1,379)	8–11	113	46	123	50	10	4	246	63	49	59	46	7	5	129	83	51	72	44	8	5	163	87	56	59	38	8	5	154
	12–15	118	46	132	51	9	3	259	82	36	136	60	7	3	225	37	32	72	62	8	7	117	37	43	39	45	10	12	86

g, girls; b, boys; d, do not wish to tell.

Students' parents were asked for their informed consent by the school for their right not to let their child to participate in the study. Post-test data from teachers and their students in both intervention and comparison groups were collected right after the intervention at the end of the school year. The questionnaire used to collect the data in both pre- and post-tests was on an electronic platform called Survey Gizmo. A paper-version of the same questionnaire was available in cases where it was impossible to use the electronic version, for example, due to a poor internet connection or other problem with the electronic system. These paper versions were added manually to the electronic file by the country coordinators.

Participants who did not give the consent, or saved empty, nearly empty or clearly implausible (for example only answering maximum or minimum values) answers were removed from the database.

Ethical Considerations

Ethical review board in the humanities and social and behavioral sciences of the University of Helsinki was requested to give a review for the project.

GDPR regulations were taken into account in protecting the privacy of the participants who were instructed to create a 6-digit code, which then was replaced in Helsinki by a participant number. As the collected data concerning the participating

countries was provided to the partner researchers, all data that might enable the identification of an individual participant (id-code, school name) was deleted and replaced by the participant number. The data file matching the participant numbers to the id-codes was saved in a separate file to enable the matching of pre- and post-test answers.

Measures

Teachers and students completed a set of questionnaires covering their well-being, epistemic beliefs and other aspects that are beyond the scope of this study. For the scope of this study, we only focus on the questions about SEL competencies and problem behavior, because they were the target of the interventions. With regard to teachers' questionnaire 12 questions concerned their knowledge of SEL and 7 questions concerned their perceived skills in implementing SEL in their classrooms. All questions concerning SEL as well as implementing SEL were presented as the last questions in the questionnaire, right before questions concerning background information.

With regard to students' questionnaire, they were asked to answer 25 questions concerning SEL, bullying, health and well-being, and self-esteem. A pilot test was conducted in an attempt to verify that the questions were easy to comprehend even for the younger group of students. As no difficulties were encountered, the questionnaires for both age groups of students (8–11- and 12–15-year-olds) were the same. However, the younger students were provided with more time and opportunities for asking questions while filling in the questionnaire. Out of the 78 questions 25 concerned SEL and they were located at the end of the questionnaire right before questions concerning background information. The other questions concerned bullying, health and well-being and self-esteem.

Teachers' perceived readiness to implement SEL learning was measured using scale (for scale validation see Talvio et al., 2016) that consisted of two components: teachers' *perceptions of the importance* of teaching SEL and teachers' *perceptions of their competence* in teaching SEL. Perceptions of the importance of teaching SEL were measured using 7 items that participants evaluated on seven-point Likert scale with response options ranging from "not at all important" (1) to "very important" (7). Examples of statements used to measure participants' perceptions of the importance of teaching SEL included "It is primarily the teacher's duty to create a classroom environment where all students feel valued" and "It is the teacher's duty to teach interactive skills such as listening and conversation skills." Perceptions of competence were measured using seven items, that participants evaluated on seven-point Likert scale with response options ranging from "strongly disagree" (1) to "strongly agree" (7). Teachers' opinions of their competence was investigated using statements such as "I am very skilled at creating a classroom environment where all students feel valued" and "I am very skilled at teaching interactive skills such as listening and conversation skills."

Students' SEL competencies were investigated using Social Emotional Competence Questionnaire (SECQ) (for scale validation see, Zhou and Ee, 2012), that consisted of 25 items and five components: self-awareness, social awareness,

self-management, relationship management and responsible decision-making (Table 4). Participants evaluated the items on six-point Likert scale with response options ranging from "Completely false" (1) to "Completely true" (7). Self-awareness relates to skills in recognizing and identifying one's own emotions, strengths and weaknesses, and understanding how they affect one's behavior. Example of an item used to investigate self-awareness: "I know what I am thinking and doing." Social awareness is the ability to understand other persons' feelings and accordingly respond to their feelings. This was measured for example with an item: "If a friend is upset, I have a pretty good idea why." Self-management is the ability to manage one's own emotional experiences and impulses. This was measured for example with an item: "I can control the way I feel when something bad happens." Relationship management refers to skills in building and maintaining relationships, conflict management and cooperation. This was measured for example with an item: "I am tolerant of my friend's mistakes." Responsible decision-making is the ability to consider ethical and societal factors in making decisions. One of the items used to measure this was: "When making decisions, I take into account the consequences of my actions."

Table 4 shows the content of the student questionnaire concerning SEL and the number of questions regarding each component.

The internal consistency of the students' SEL scales varied between 0.72 and 0.84 (Cronbach's alpha) showing moderate to good internal consistency. The results reported were based on the sum scores of the pre-test.

In this study, students' problem behavior was defined as bullying, truancy and substance abuse. These items were measured by using a three-point or five-point Likert scale. Bullying and participating in physical fights were measured by asking "How many times were you involved in bullying during the last month?" and "How many times were you involved in a physical fight during the last month?" using a five-point Likert scale ranging from response options "I have not bullied at school during the last month" (1) to "I have bullied at school once a week" (5) and "I have not been in physical fights during the last month" (1) to "four times or more" (5). Truancy was measured by asking "Have you been absent due to skipping on purpose during the last month?" and with the response options ranging from "None" (1) to "More than 5 days" (5). The frequency of possible substance abuse was measured by using a three-point Likert scale with the response options ranging from "No" (1) to "Now and then" (3). The likelihood of yielding to social pressure was measured with a question "If one of your best friends was to offer you any of these, would you use it?" separately for alcohol, tobacco and drugs and the response options ranging from "I would not know what it is" (1) to "Certainly yes" (5).

The sum variable "Problem behavior" was constructed by forming a sum score of these items and scaling them to start from zero. The internal consistency of the students' problem behavior-scale scale was 0.68 in the pre-test and 0.70 in the post test (Cronbach's alpha) showing moderate to good internal consistency. The results reported are based on the sum scores of the post test.

TABLE 4 | Items, variables and Cronbach's alpha and internal consistencies of the sum variables that measure students' social and emotional competence across all countries.

Items	Sum variable's name	Cronbach's alpha
1. I know what I am thinking and doing.	S1 (Self-awareness)	0.72
2. I understand why I do what I do.		
3. I understand my moods and feelings.		
5. I can read people's faces when they are angry.	S2 (Social awareness)	0.80
6. I recognize how people feel by looking at their facial expressions.		
7. It is easy for me to understand why people feel the way they do.		
8. If someone is sad, angry or happy, I believe I know what they are thinking.		
9. I understand why people react the way they do.		
10. If a friend is upset, I have a pretty good idea why.	S3 (Self-management)	0.80
11. I can stay calm in stressful situations.		
12. I stay calm and overcome anxiety in new or changing situations.		
13. I stay calm when things go wrong.		
14. I can control the way I feel when something bad happens.		
16. I will always apologize when I hurt my friend unintentionally.		
17. I always try and comfort my friends when they are sad.		
18. I try not to criticize my friend when we quarrel.	R1 Relationship management)	0.76
19. I am tolerant of my friend's mistakes.		
20. I stand up for myself without putting others down.		
21. When making decisions, I take into account the consequences of my actions.		
22. I try to make choices that have the most positive outcomes expected.		
23. I weigh the strengths of the situation before deciding what I will do.		
24. If I make a recommendation, I think about the criteria behind my recommendation.		
25. I consider the strengths and weaknesses of the strategy before deciding to use it.	R2 (Responsible decision-making)	0.84

Statistical Procedures

Statistical differences between the scores of the pre-test and the post-test were examined with repeated measures ANOVA (GLM). SPSS 25 was used in the analyses. The mean sum scores were conducted from the multi-item measures and used these as variables in further analyses. Repeated measures ANOVA tested the "time*group" and "time*group*age group" interaction examining the effect of the intervention with regards to mean change over time across groups in the variables. The analyses were conducted separately for each country and to all countries combined.

Furthermore, the difference between the number of representatives in gender groups was tested as well as the possible change between pre- and post-tests between and within the age groups. These were statistically controlled for different age groups in evaluating the effect of the intervention. The possible effect of students' age and gender as background variables were thus taken into account.

RESULTS

Results Country by Country

In order to answer the first research question, "Did the *SEL competences assessment practices intervention* result to a positive development on teachers' perceived readiness to implement SEL learning?" **Table 5** shows that, all teachers, regardless of being in the intervention or comparison group, scored very

high in their perceived *importance* of social and emotional learning both in pre- and post-tests. The lowest mean value was in Lithuania and the highest was in Italy. Concerning their perceived SEL *competence*, all teachers scored in the pre-test between 5.3 and 5.5. The lowest mean value was in Latvia and the highest in Lithuania. Repeated measures ANOVA (GLM) was used to test the gain scores between and within (pre- and post-tests) groups examining the effect of the intervention with regards to mean change over time across the groups. The analyses were conducted separately for each country and to all countries combined. The investigations of the data revealed that no statistically significant changes were found in the analysis concerning teachers' SEL competencies.

The second and third research questions were: "Is there a difference between the two participating age groups (the age group of 8–11-years old and the age group of 12–15-years old) in terms of SEL competencies and in the amount of students' problem behavior?"

First, we studied the possible change in the five core components of SEL in within the intervention and comparison groups as well as between these two groups in both of the age groups between pre- and post-tests in each of the participating countries. In the second phase we studied the possible change in the five elements of SEL as well as the possible change in Problem behavior within intervention and comparison groups as well as within both age groups between pre- and post-tests and between the intervention

TABLE 5 | Teachers perceived importance and competence in SEL.

		Intervention				Comparison				<i>F</i> (<i>df</i>)	<i>p</i>	Partial Eta Sq
		Pre		Post		Pre		Post				
		<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)	<i>n</i>	<i>M</i> (<i>SD</i>)			
Italy	Im	38	6.6 (0.37)	38	6.6 (0.45)	37	6.3 (0.52)	37	6.3 (0.67)	0.187 (1, 75)	0.67	0.003
	Co	38	5.3 (0.91)	38	5.5 (0.74)	37	5.3 (0.74)	37	5.3 (0.76)	1.09 (1, 74)	0.30	0.15
Latvia	Im	62	6.2 (0.65)	62	6.0 (0.65)	30	6.0 (0.59)	30	6.0 (0.46)	1.96 (1, 91)	0.17	0.021
	Co	62	5.3 (0.62)	62	5.3 (0.62)	30	5.4 (0.9)	30	5.3 (0.50)	0.23 (1, 91)	0.63	0.003
Lithuania	Im	66	6.1 (0.60)	66	6.3 (0.49)	35	6.0 (0.79)	35	6.1 (0.74)	0.93 (1, 100)	0.34	0.009
	Co	66	5.5 (0.56)	66	5.6 (0.56)	35	5.6 (0.78)	35	5.5 (0.70)	0.95 (1, 100)	0.33	0.010
Slovenia	Im	41	6.3 (0.67)	41	6.2 (0.78)	41	6.3 (0.48)	41	6.2 (0.65)	2.05 (1, 43)	0.16	0.046
	Co	41	5.4 (0.79)	41	5.6 (0.87)	41	5.3 (0.78)	41	5.4 (0.84)	1.21 (1, 42)	0.28	0.029
Spain	Im	33	6.4 (0.45)	33	6.6 (0.49)	11	6.5 (0.6)	11	6.4 (0.85)	0.21 (1, 81)	0.65	0.003
	Co	33	4.7 (0.9)	33	4.5 (0.8)	10	5.7 (0.90)	10	6.0 (0.66)	0.43 (1, 81)	0.51	0.005

Im, perceived importance; *Co*, perceived competence.

and the comparison groups with all the participants from all countries combined.

Table 6 describes the number of participants, mean values, standard deviations in pre- and post-tests in both intervention and comparison groups. Interaction effects of all variables of SEL are provided here country by country. The scores are presented for two age groups individually. As can be seen, significant changes took place or there was a significant interaction between age, only after taking the variance between the age groups within both the intervention and comparison groups and between measurement points (pre-test and post-test) into account. The only interaction effects approaching significance were observed between the intervention and the comparison groups in social awareness among the younger age group in Latvia, and in self-management in Lithuania.

As **Table 6** shows, there were no significant differences between pre- and post-tests in any country, in terms of students' SEL in country by country comparisons. There were some almost significant ($p = 0.07$ – 0.08) trends in some of the variables studied: Social awareness improved in the Latvian student sample in both age groups as well as in Slovenian 8–11-year old student sample. There was also a non-significant positive change in the Lithuanian 8–11-year old student sample in both self-awareness and self-management as well as in self-awareness and relationship skills in the 8–11-year old Spanish student sample. Responsible decision making slightly improved in the age group of 12–15-year old students in the Italian sample, whereas there was a negative change in the same variables in the 8–11-year old Italian student sample.

Table 6 also shows that there was a significant interaction between age, group and SEL skills in some countries: Some of these changes were negative indicating that the change in question was not desirable: Italian 8–11-year old students slightly decreased in their experienced social awareness and responsible decision making. Spanish 12–15-year old students slightly decreased in their self-awareness, relationship skills and responsible decision making during the intervention. There

was also a negative development in the Slovenian 12–15-year old students' social awareness. These results did not reach statistical significance.

Statistical analysis revealed no statistically significant changes between these measurements, when the countries were looked at separately. Therefore, we combined the results of all countries.

Results After Combining the Countries

During the second phase, the perceived SEL was studied across all five core components of SEL as well as Problem behavior with all the countries together. **Table 7** shows the summary of the combined results.

SEL in Age Group 1 (8–11 Years Old)

Table 7 shows that the results of repeated measures GLM regarding *Self-awareness* (S1) in younger age group (8–11-year old) indicated no significant change across both groups [$F_{(1, 299)} = 7.552$, $p = 0.12$, partial $\eta^2 = 0.028$]. In addition, no statistically significant interaction between the training (i.e., pre- and post-test) and the group [$F_{(1, 2299)} = 0.523$, $p = 0.47$, partial $\eta^2 = 0.000$] could be found. However, when examining the intervention group and comparison group separately it was found that the change was significant in the intervention group [$F_{(1, 2299)} = 7.58$, $p = 0.006$, partial $\eta^2 = 0.003$] but not in the comparison group [$F_{(1, 2299)} = 1.702$, $p = 0.192$, partial $\eta^2 = 0.001$].

In the *Self-management* (S2) there was a significant positive change across intervention and comparison groups [$F_{(1, 2288)} = 8.992$, $p = 0.006$, partial $\eta^2 = 0.003$]. However, the interaction between the training and the group was not significant [$F_{(1, 2288)} = 0.136$, $p = 0.712$, partial $\eta^2 = 0.000$]. When investigating the intervention group and the comparison group separately, it was found that the change was significant in the intervention group [$F_{(1, 2288)} = 7.13$, $p = 0.008$, partial $\eta^2 = 0.003$], but not in the comparison group [$F_{(1, 2299)} = 2.871$, $p = 0.09$, partial $\eta^2 = 0.001$].

TABLE 6 | Number of participants, mean values, standard deviations and interaction effects of all variables of SEL country by country in alphabetical order.

Country	Age group	Variable	Intervention				Comparison				T × IntCom			T × IntCom × Age		
			Pre		Post		Pre		Post		F (df)	p	d	F (df)	p	d
			n	M (SD)	n	M (SD)	n	M (SD)	n	M (SD)						
Italy	8–11	S1	584	4.8 (0.7)	449	4.6 (0.6)	320	4.7 (0.7)	310	4.7 (0.6)	1.578 (1, 1,350)	0.21	0.001	1.656 (1, 1,350)	0.20	0.001
		S2	584	4.1 (0.9)	449	3.9 (0.8)	320	4.0 (1.0)	310	4.1 (0.8)	0.011 (1, 1,351)	0.91	0	4.087 (1, 1,351)	0.04*	0.003
		S3	584	3.8 (1.1)	449	3.4 (1.0)	320	3.7 (1.1)	310	3.4 (1.0)	2.227 (1, 1,349)	0.14	0.002	0.165 (1, 1,349)	0.69	0
		R1	583	4.7 (0.9)	449	4.5 (0.8)	319	4.5 (0.9)	310	4.5 (0.8)	0.127 (1, 1,346)	0.72	0	0.333 (1, 1,346)	0.56	0
		R2	583	4.8 (0.9)	449	4.5 (0.8)	318	4.7 (0.9)	309	4.5 (0.7)	1.212 (1, 1,345)	0.27	0.001	3.241 (1, 1,345)	0.07	0.002
	12–15	S1	465	4.8 (0.7)	370	4.7 (0.6)	263	4.8 (0.7)	262	4.7 (0.6)						
		S2	465	4.0 (1.0)	370	4.0 (0.8)	263	4.1 (1.0)	262	4.0 (0.8)						
		S3	465	3.7 (1.1)	370	3.4 (1.1)	263	3.8 (1.1)	261	3.5 (1.0)						
		R1	464	4.7 (0.8)	370	4.5 (0.8)	262	4.7 (0.8)	261	4.4 (0.8)						
		R2	465	4.7 (0.9)	370	4.5 (0.8)	262	4.7 (0.8)	261	4.5 (0.8)						
Latvia	8–11	S1	501	4.5 (1.0)	530	4.4 (0.9)	335	4.6 (1.0)	434	4.6 (0.7)	0.534 (1, 1,187)	0.47	0	0.153 (1, 1,187)	0.70	0
		S2	498	3.8 (1.1)	524	3.7 (0.9)	333	3.8 (1.1)	431	3.9 (0.9)	3.395 (1, 1,178)	0.07	0.003	0.299 (1, 1,178)	0.58	0
		S3	493	3.9 (1.0)	523	3.7 (1.0)	328	4.1 (1.0)	431	3.9 (0.9)	2.145 (1, 1,168)	0.43	0.001	1.981 (1, 1,168)	0.16	0.002
		R1	494	4.5 (1.0)	515	4.3 (0.9)	328	4.6 (1.0)	428	4.5 (0.8)	0.626 (1, 1,170)	0.43	0	0.402 (1, 1,170)	0.53	0
		R2	496	4.5 (0.9)	515	4.1 (0.9)	327	4.6 (1.0)	425	4.3 (0.9)	0.041 (1, 1,165)	0.84	0	0.015 (1, 1,165)	0.9	0
	12–15	S1	370	4.5 (1.0)	330	4.5 (0.8)	230	4.7 (0.8)	263	4.6 (0.8)						
		S2	367	3.9 (1.1)	327	3.9 (0.9)	230	3.9 (0.9)	263	4.0 (0.9)						
		S3	367	4.0 (1.0)	325	3.8 (1.0)	230	4.1 (1.0)	261	3.9 (1.0)						
		R1	368	4.5 (0.9)	327	4.4 (0.8)	229	4.7 (0.9)	262	4.4 (0.8)						
		R2	367	4.4 (1.0)	325	4.2 (0.8)	230	4.6 (1.0)	262	4.3 (0.9)						
Lithuania	9–11	S1	269	4.6 (1.2)	293	4.8 (0.9)	346	4.7 (1.0)	309	4.9 (0.8)	1.549 (1, 735)	0.21	0.002	3.682 (1, 735)	0.06	0.005
		S2	268	4.2 (1.3)	293	4.3 (1.1)	346	4.4 (1.0)	308	4.2 (1.0)	0.098 (1, 733)	0.75	0.002	1.977 (1, 733)	0.16	0.003
		S3	265	4.0 (1.3)	294	4.3 (1.0)	343	4.3 (1.1)	305	4.0 (0.9)	3.13 (1, 726)	0.08	0.004	0.424 (1, 726)	0.51	0.001
		R1	268	4.4 (1.2)	294	4.9 (0.9)	344	4.8 (0.9)	309	4.6 (0.8)	0.134 (1, 730)	0.71	0	1.868 (1, 730)	0.17	0.003
		R2	268	4.5 (1.1)	294	4.8 (0.9)	344	4.6 (1.1)	308	4.5 (0.9)	0.109 (1, 731)	0.74	0	2.294 (1, 731)	0.13	0.003
	12–15	S1	173	4.7 (1.0)	203	5.0 (0.8)	191	4.7 (1.0)	173	4.8 (0.8)						
		S2	173	4.3 (1.1)	203	4.5 (1.0)	189	4.2 (1.2)	173	4.3 (1.0)						
		S3	172	4.0 (1.2)	203	4.5 (1.0)	186	4.0 (1.2)	173	4.0 (1.0)						
		R1	171	4.5 (1.1)	202	5.0 (0.9)	188	4.7 (1.1)	173	4.7 (0.8)						
		R2	172	4.4 (1.2)	203	4.8 (0.9)	188	4.5 (1.1)	172	4.6 (0.9)						
Slovenia	8–11	S1	193	4.9 (0.8)	126	5.0 (0.8)	168	5.0 (0.8)	98	5.0 (0.7)	0.002 (1, 287)	1.0	0	0.009 (1, 287)	0.9	0
		S2	193	4.2 (1.1)	126	4.3 (0.8)	166	4.1 (1.2)	98	4.1 (0.8)	1.846 (1, 285)	0.18	0.006	6.781 (1, 285)	0.01*	0.023
		S3	193	4.3 (0.8)	126	4.2 (1.0)	163	4.3 (1.0)	96	4.1 (0.9)	0.286 (1, 282)	0.59	0.001	0.703 (1, 282)	0.40	0.002
		R1	193	4.9 (0.8)	126	4.9 (0.7)	171	4.6 (1.0)	98	4.9 (0.7)	0.314 (1, 289)	0.58	0.001	1.361 (1, 289)	0.24	0.005
		R2	193	4.8 (0.8)	124	4.7 (0.8)	171	4.5 (1.0)	98	4.7 (0.7)	0.005 (1, 289)	0.95	0	0.086 (1, 289)	0.77	0
	12–15	S1	158	5.2 (0.8)	45	4.9 (0.9)	53	5.0 (0.7)	40	5.0 (0.8)						
		S2	157	4.3 (1.1)	45	4.4 (1.0)	53	4.1 (1.0)	40	4.4 (0.9)						
		S3	157	4.3 (1.2)	45	4.1 (1.1)	53	4.4 (1.0)	40	4.0 (1.0)						
		R1	157	5.0 (0.8)	45	4.8 (0.8)	53	5.0 (0.8)	39	5.1 (0.8)						
		R2	157	4.9 (0.9)	45	4.5 (0.9)	53	4.7 (0.9)	39	4.6 (1.0)						
Spain	8–11	S1	409	5.2 (0.8)	346	5.0 (0.7)	282	5.1 (0.7)	416	5.0 (0.7)	0.349 (1, 576)	0.56	0.001	11.549 (1, 576)	0.001*	0.02
		S2	406	4.4 (1.1)	345	4.2 (0.9)	280	4.1 (1.1)	415	4.3 (0.9)	0.878 (1, 570)	0.34	0.003	0.009 (1, 570)	0.91	0
		S3	404	4.5 (1.1)	341	4.1 (1.0)	279	4.2 (1.1)	412	4.1 (1.1)	2.422 (1, 564)	0.12	0.004	0.142 (1, 564)	0.70	0
		R1	405	5.1 (0.8)	341	4.9 (0.8)	279	5.1 (0.9)	415	4.9 (0.8)	0.467 (1, 566)	0.50	0.001	3.039 (1, 566)	0.08	0.005
		R2	403	5.1 (0.9)	343	4.7 (0.9)	278	4.9 (0.9)	413	4.8 (0.9)	2.117 (1, 563)	0.15	0.004	5.114 (1, 563)	0.02*	0.009
	12–15	S1	162	5.4 (0.7)	84	4.7 (0.9)	152	5.1 (0.9)	182	4.9 (0.8)						
		S2	162	4.5 (1.2)	84	4.1 (0.8)	151	4.2 (1.0)	180	4.4 (0.8)						
		S3	159	4.5 (1.2)	84	3.7 (1.0)	151	4.3 (1.1)	179	4.0 (1.1)						
		R1	157	5.3 (0.7)	84	4.6 (0.8)	152	5.2 (0.8)	179	4.8 (0.9)						
		R2	157	5.3 (0.7)	84	4.4 (1.0)	152	5.0 (0.8)	177	4.7 (0.9)						

**p* < 0.05. S1, Self-awareness; S2, Social awareness; S3, Self-management; R1, Relationship management; R2, responsible decision making.

TABLE 7 | SEL and problem behavior in both age groups separately in pre- and post-tests and in intervention and comparison groups.

Variable	Age Group	Intervention				Comparison			
		Pre		Post		Pre		Post	
		<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
S1	8–11	1,386	4.87 (0.81)	1,386	4.94 (0.81)	915	4.83 (0.83)	915	4.87 (0.82)
	12–15	1,051	4.69 (0.76)	1,051	4.66 (0.76)	938	4.78 (0.74)	938	4.74 (0.77)
S2	8–11	1,379	4.10 (1.06)	1,379	4.03 (0.99)	911	4.03 (0.99)	911	4.09 (0.00)
	12–15	1,046	3.99 (0.87)	1,046	4.06 (0.87)	935	4.13 (0.90)	935	4.15 (0.88)
S3	8–11	1,371	4.13 (1.10)	1,371	4.11 (1.11)	898	4.04 (1.05)	898	4.06 (1.08)
	12–15	1,044	3.71 (0.99)	1,044	3.69 (1.04)	928	3.84 (1.02)	928	3.79 (1.06)
R1	8–11	1,371	4.84 (0.88)	1,371	4.86 (0.86)	907	4.76 (0.88)	907	4.80 (0.86)
	12–15	1,043	4.57 (0.82)	1,043	4.51 (0.83)	931	4.61 (0.85)	931	4.59 (0.87)
R2	8–11	1,373	4.80 (0.92)	1,373	4.76 (0.93)	905	4.69 (0.93)	905	4.69 (0.91)
	12–15	1,043	4.45 (0.86)	1,043	4.41 (0.85)	926	4.44 (0.85)	926	4.52 (0.91)
Problem	8–11	1,033	0.95 (3.68)	1,033	1.34 (3.32)	748	0.99 (3.34)	758	1.24 (3.82)
Behaviour ^a	12–15	877	0.61 (5.05)	877	1.29 (5.91)	758	0.19 (4.85)	758	0.63 (5.85)

S1, *Self-awareness*; S2, *Self-management*; S3, *Social awareness*; R1, *Relationship skills*; R2, *Responsible decision making*. ^aCalculated from z-scores.

In the *Social awareness* (S3) there were no differences across the groups [$F_{(1, 2267)} = 0.004$, $p = 0.951$, partial $\eta^2 = 0.000$] nor between the training and the group [$F_{(1, 2267)} = 0.324$, $p = 0.569$, partial $\eta^2 = 0.000$] were found. No significant changes between the measuring points were found in the intervention group [$F_{(1, 2267)} = 0.162$, $p = 0.687$, partial $\eta^2 = 0.000$] or in the comparison group [$F_{(1, 2267)} = 0.165$, $p = 0.685$, partial $\eta^2 = 0.000$].

The results regarding *Relationship skills* (R1) showed no changes across both groups [$F_{(1, 2276)} = 1.70$, $p = 0.193$, partial $\eta^2 = 0.001$] or between the training and the group [$F_{(1, 2276)} = 0.330$, $p = 0.566$, partial $\eta^2 = 0.000$]. Changes between pre- and post-test in both intervention group [$F_{(1, 2276)} = 0.333$, $p = 0.566$, partial $\eta^2 = 0.000$] and in the comparison group [$F_{(1, 2276)} = 1.464$, $p = 0.226$, partial $\eta^2 = 0.001$] were not significant.

No significant changes [$F_{(1, 2276)} = 0.805$, $p = 0.370$, partial $\eta^2 = 0.000$] were found across both groups in *Responsible decision making* (R2). In addition, no change was found between the training and the group [$F_{(1, 2276)} = 0.946$, $p = 0.331$, partial $\eta^2 = 0.000$]. Further, the changes between the measuring points remained non-significant in both the intervention group [$F_{(1, 2276)} = 2.200$, $p = 0.138$, partial $\eta^2 = 0.001$] and in the comparison group [$F_{(1, 2276)} = 0.002$, $p = 0.124$, partial $\eta^2 = 0.001$].

SEL in Age Group 2 (12–15 Years Old)

According to the results of the repeated measures GLM *Self-awareness* (S1) among older students (12–15 years old) no significant change was found across the groups [$F_{(1, 1987)} = 3.737$, $p = 0.053$, partial $\eta^2 = 0.002$]. In addition, the change between the training and the group remained non-significant [$F_{(1, 1987)} = 0.001$, $p = 0.971$, partial $\eta^2 = 0.000$] as well as the changes between the measuring points in both the intervention group [$F_{(1, 1987)} = 2.055$, $p = 0.152$, partial $\eta^2 = 0.001$] and in the comparison group [$F_{(1, 1987)} = 1.703$, $p = 0.192$, partial $\eta^2 = 0.001$] (see **Table 7**).

In the *Self-management* (S2) the difference across groups was significant [$F_{(1, 1979)} = 5.364$, $p = 0.021$, partial $\eta^2 = 0.003$]. However, the change between the measuring point and the group [$F_{(1, 1979)} = 1.605$, $p = 0.205$, partial $\eta^2 = 0.001$] was non-significant. Further investigations revealed positive significant change in the intervention group [$F_{(1, 1979)} = 6.800$, $p = 0.009$, partial $\eta^2 = 0.003$] but not in the comparison group [$F_{(1, 1979)} = 0.521$, $p = 0.470$, partial $\eta^2 = 0.000$].

No significant changes were found in the differences of *Social awareness* (S3) Across groups [$F_{(1, 1970)} = 1.894$, $p = 0.169$, partial $\eta^2 = 0.001$] or between the training and the group [$F_{(1, 1970)} = 0.673$, $p = 0.412$, partial $\eta^2 = 0.000$]. No significant changes between measuring points in the intervention group [$F_{(1, 1970)} = 0.164$, $p = 0.685$, partial $\eta^2 = 0.000$] or in the comparison group [$F_{(1, 1979)} = 2.278$, $p = 0.131$, partial $\eta^2 = 0.001$].

The results regarding *Relationship skills* (R1) showed a significant change across groups [$F_{(1, 1972)} = 4.532$, $p = 0.033$, partial $\eta^2 = 0.002$]. However, the interaction between the training and the group was non-significant [$F_{(1, 1972)} = 0.862$, $p = 0.353$, partial $\eta^2 = 0.000$]. The significant negative development of the intervention group was found between the measuring point [$F_{(1, 1972)} = 4.954$, $p = 0.026$, partial $\eta^2 = 0.003$] whereas no development was found in the comparison group [$F_{(1, 1972)} = 0.682$, $p = 0.409$, partial $\eta^2 = 0.000$].

The results of repeated measures GLM regarding *Responsible decision making* (R2) indicated a significant change across both groups [$F_{(1, 1967)} = 1.972$, $p = 0.16$, partial $\eta^2 = 0.001$]. However, no statistically significant interaction between the training (i.e., pre- and post-test) and the group [$F_{(1, 1967)} = 0.499$, $p = 0.48$, partial $\eta^2 = 0.000$] could be found. However, when examining the intervention group and comparison group separately it was found that there were no significant differences between measurements in the intervention group [$F_{(1, 1967)} = 2.368$, $p = 0.124$, partial $\eta^2 = 0.001$] or in the comparison group [$F_{(1, 1967)} = 0.230$, $p = 0.632$, partial $\eta^2 = 0.000$].

Problem Behavior in Age Group 1 (8–11-Years Old)

In the group of younger students the results of repeated measures GLM revealed a significant change across the intervention and the comparison groups [$F_{(1, 1779)} = 11.819, p = 0.001, \text{partial } \eta^2 = 0.007$] in Problematic behavior. However, the interaction between the training and the group was not found significant [$F_{(1, 1779)} = 0.620, p = 0.431, \text{partial } \eta^2 = 0.000$]. However, when investigating the differences between measurements in intervention and comparison group separately there was a statistical positive development as a reduction of problem behavior in the intervention group [$F_{(1, 1779)} = 10.628, p = 0.001, \text{partial } \eta^2 = 0.006$] but not in the comparison group [$F_{(1, 1779)} = 3.028, p = 0.0082, \text{partial } \eta^2 = 0.002$].

Problem Behavior in Age Group 2 (12–15-Years Old)

The results of the older students of the Problematic behavior showed that across groups there was a significant change over time [$F_{(1, 1663)} = 19.151, p < 0.001, \text{partial } \eta^2 = 0.012$] whereas the interaction between the training and the group was non-significant [$F_{(1, 1663)} = 0.937, p < 0.333, \text{partial } \eta^2 = 0.001$]. The significant negative development between measuring points was found both in the intervention group [$F_{(1, 1663)} = 15.401, p < 0.000, \text{partial } \eta^2 = 0.009$] and in the comparison group [$F_{(1, 1663)} = 5.404, p < 0.020, \text{partial } \eta^2 = 0.003$].

To conclude, the interactions of the time (pre and post) and group (intervention and comparison) were not significant showing that the effect of the intervention was vague. Pairwise comparisons showed some statistically significant both positive and negative changes in the intervention group, even when the change in the comparison group remained non-significant (i.e., younger students' Self-awareness, Self-management and Problem behavior and older students' Self-management and Relationship skills).

Due to the sensitive nature of the sum variable, all the participating countries were tested as one group. Univariate analyses of Variance was used to study the possible effect of the intervention. **Table 8** shows that no statistically significant change in students' problem behavior was found during the intervention.

DISCUSSION

The present study investigated the effectiveness of the toolkit designed for assessing social and emotional skills in school. The main results showed that there was no statistically significant change in the answers between pre- and post-test given by the teachers. For the students no significant changes were found when looking at the results country by country. However, when looking at the students all together, there was a statistically significant positive change in the reports given in age group 1 in self-awareness and in self-management in the intervention group. No statistically significant change could be found in the comparison group. In the age group 2 there was a statistically significant negative development in terms of relationship skills

in the intervention group whereas no statistically significant change could be found in the comparison group. In responsible decision making a significant change was found across both intervention and comparison group so it cannot be traced back to the intervention.

A similar development was found in problem behavior. In age group 1 a statistically significant positive development was found in the intervention group but not in the comparison group. In age group 2 no significant change was found.

Despite the fact that the teachers' reported competences and experienced importance of SEL did not change, there was still some change in the intervention group of the students that did not occur in the comparison group. The target of the intervention was to change assessment practices to assess competencies of the students rather than their factual knowledge. It is quite typical that the assessment is "the tail that wags the dog." i.e., by changing assessment practices, we may be able to change the students' behavior and even their ways of thinking. However, there is some research suggesting that the change in assessment practices may not result in desired statistically significant outcomes concerning students' motivation and achievement (Yin et al., 2008). Formative assessment as a tool for learning may help the students to study for assessment or and change their goals accordingly (Dann, 2014). It was therefore possible that change took place among the students regardless of lack of change among their teachers.

When we combined the countries, it appeared that there was favorable development in the intervention in terms of the experienced self-awareness and self-management of the younger age group (8–11). In the older age group (12–15), only the experienced self-awareness increased over time in the intervention group, but not in the comparison group. In this age group, the relationship skills even decreased in the intervention group. It appeared that the intervention had some added value especially among the younger participants that could not be explained based on the development during the 6 months. However, considering that the interactions were not significant, we cannot conclude that the intervention was the reason for the changes among the students.

Because the intervention was about assessing the SEL skills, it is possible that it only raised the self-awareness of the students but did not quite reach the level of improving their skills. The puberty may have had an effect on the teenager group, it may have made it difficult for them to manage themselves and becoming aware of their self-management problems may have made the experience their relations skills even lower than before the intervention. Looking at these results makes sense: starting to assess and reflect one's SEL skills is the first step toward starting to develop such skills. It is possible that teachers and their students learned from the intervention in the way that the students started to be aware of their own behavior. This is a good start for future learning of these skills, and it is valuable to further continue the efforts in teaching SEL more concretely.

The research methods should also be reflected on. The research sample was not randomized and it appears the analysis method including the questionnaire just did not capture participants' learning in this case. Despite the satisfactory

TABLE 8 | Change in a sum variable called *problem behavior* that combined items concerning bullying, substance abuse and truancy.

	Intervention			Comparison			Intcom		
	<i>n</i>	Mean	Std Dev	<i>n</i>	Mean	Std Dev	<i>F</i> (df)	<i>p</i>	<i>d</i>
Problem behavior	1,963	0.04	0.28	1,548	0.04	0.29	0.54 (1, 3,510)	0.46	0

Intcom, between subjects effects.

psychometric properties of the questionnaire, the instrument may have been too long and in some respect inappropriate for the targeted age groups of the students. It may also be that the questionnaire despite the back-translation process did not yield to different cultures due to translation difficulties regarding cultural expressions. However, on behalf of the teachers, probably the problem did not lie in the measurement instruments, because the same instruments had previously captured teachers' development of SEL in different countries. These previous studies were on well-established and well-structured instructional procedures such as Lions Quest (Talvio et al., 2016, 2019). Such programs do not only aim at assessing SEL, but also provide concrete tools for developing the related skills. Because there could have been even 6 months between the pre- and post-tests, there may have been other development taking place in the students that could not be differentiated from the effects of the intervention.

Collecting post-data right before the end of the school year might have affected the answers of both the teachers and their students. For teachers the measurement point may have been too wide apart so that the contents possibly learned during the intervention had been forgotten due to the heterogeneous nature of the teachers' workload. Teachers might also be busy with evaluation processes as well as different school activities concerning the end of the school year. At the same time, students might be disengaged and focused on the upcoming summer holiday. Therefore, it is possible that teachers and their students learned more than what the post-test showed.

Of course, it is also possible that the interventions were not effective at short term. They were newly developed and the time for their testing and their further development might have been too short. Indeed, many established trainings (for example Lions Quest) for promoting positive growth and well-being (Lions Quest, Youth Effectiveness Training) have been available over 30 years, during which time they have been continuously developed, based on the feedback of teachers and their students. Accordingly, developing SEL interventions might need more time and continuous interaction between the program developers, practitioners and policy makers. In addition, in the studies of expertise, it takes time to proceduralize the knowledge into skills (e.g., Ericsson and Ward, 2016). Some studies (Baartman and De Bruijn, 2011) suggest that transformative integration of knowledge, skills and attitude requires critical self-reflection and openness to change. From this point of view it is possible the measuring points were too close to each other for the teachers to become experts in teaching SEL and accordingly the students to gain knowledge (from the teachers) that

would have then transformed into skills with sufficient amount of practice.

It was important, though, that the research partner was independent of those who carried out the interventions. This applies especially in the case like this, where the results are not quite desirable. We think, however, that this is also an important research result: there were no obvious changes in the actual relationship skills by using this kind of intervention design. More work is needed to develop the interventions further, from assessing the SEL skills into systematically training them during a longer period of time. Acquiring social and emotional skills and learning to apply them in classroom situations and in teaching is a time consuming process which is not likely to happen over a short period of time. It would be also important to test the actual skills in different contexts and with more fine-grained research instruments.

More contextual information about specific schools would have been enriching, but the current ethical and GDPR regulations of EU did not allow us to risk the anonymity of the participants. Some schools were so small that there were only two teachers. Revealing the school name would have also revealed their identity. Large-scale studies have their benefits, but may hide some important contextual variation. However, participating countries are preparing additional analysis regarding the data content concerning exclusively the teachers and students of their own country. In addition, the qualitative research based on the monitoring procedures of the intervention is being conducted at the University of Latvia (in progress) and it may reveal more about the contextual aspects of the interventions.

We shall also see, whether some starting points of the teachers and students would have resulted in so called ATI (aptitude-treatment interactions). Even though all the participants were provided with equal opportunities to gain as much as their abilities allow, the individual starting levels of the participants may affect the results (Merrill, 1975). Such questions were not included in the research problems of the project goals, but we shall be able to use the data in order to test some new hypotheses. In all, the project produced important new information of the complexity that has arisen in many investigations of SEL issues (Collie et al., 2017; Lawson et al., 2019) and inspired many new research questions.

CONCLUSIONS

Even the most popular SEL approaches used at school do not always present strong evidence of effectiveness in learning

SEL (Corcoran et al., 2018). Even though the use of quasi-experimental design with pre-validated questionnaires has been practical in assessing many well-known established SEL interventions, the effect of the intervention may still be difficult to capture (Ura et al., 2020). We found out that already starting to focus on the assessment of SEL appeared to change the participants' self-awareness regardless of the age group. The younger participants even learned some self-management skills that were more difficult for the teenagers. This may indicate that interventions should be started before the stormy phase of puberty. However, regarding new SEL interventions more contextual and qualitative approach in investigations would probably give more understanding of how the interventions could be further developed.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: GDPR regulations were taken into account. All data that might enable the identification of an individual participant was deleted and replaced by a participant number. The data file matching the participant codes for matching the pre- and post-test answers is saved in a separate file at the University of Helsinki. Requests to access these datasets should be directed to lauri.hietajarvi@helsinki.fi.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethical Review Board in the humanities and social and behavioral sciences of the University of Helsinki. Written

informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MB: leading writer. MT: post-doc researcher of the project and contributor to data analysis as well as supervisor of MB and contributor to the writing process. LH: data analyses. IB, VC, EC, IR, BM, and ST: collecting of data and contributing to writing. FC and MK: contributing to writing. MF: contributing to composing the intervention and writing. VO: arranging the intervention in Italy and contributing to writing. DŠ: contributing to the content of the intervention and to the writing. KL: supervising the project and MB as well as contributing to writing. All authors contributed to the article and approved the submitted version.

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Proof of Concept: A Brief Psycho-Educational Training Program to Increase the Use of Positive Emotion Regulation Strategies in Individuals With Autism Spectrum Disorder

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Attenuated positive emotions and difficulties in regulating emotions are frequently observed in individuals with autism spectrum disorders (ASD) and are linked to increased risk of affective disorders, problematic behaviors, and impaired socio-emotional functioning. As such, interventions specifically focused on positive emotion regulation (ER) skills could be very valuable for individuals with ASD, their caregivers, and therapists. However, the field of positive ER in ASD is under-researched. The present study aimed at testing the practical potential and the preliminary effects of a brief novel psycho-educational training program on positive ER for individuals with ASD. Thirty male participants with ASD (aged 10–35 years; $N_{\text{training}} = 14$, $N_{\text{waitlist}} = 16$) underwent a three-session program on the use of adaptive positive ER strategies (i.e., attentional deployment, cognitive change, and response modulation). Participants rated the program as easy to understand, interesting, pleasant, and likable. No dropouts or adverse effects were observed. The training group showed a significant increase in the self-reported use of the ER strategies compared to the waitlist group. The increase in the use of ER strategies maintained up to 7 weeks in the overall sample. Having reached high satisfaction rates and the intended effects in this proof of concept study, this novel program represents a promising tool to support ER. Future research should next investigate the efficacy of the intervention on day-to-day emotional experience and wellbeing.

Clinical Trial Registration: ClinicalTrials.gov # NCT02898298

Keywords: autism spectrum disorder, psycho-educational intervention, positive emotion regulation, emotion regulation strategies, behavioral intervention

INTRODUCTION

Emotion-related difficulties, such as affective disorders (anxiety and depression) and problematic behaviors (tantrums and aggression), are highly prevalent in individuals with autism spectrum disorder (ASD) and persist across the life span (Gotham et al., 2015; Mikita et al., 2015; Patel et al., 2017; Hollocks et al., 2018; Hudson et al., 2019). These difficulties, identified

as markers of emotion regulation impairments (Mazefsky et al., 2013; Richey et al., 2015; Berkovits et al., 2017), are linked to maladaptive behavior, negative mental health outcomes, and impaired socio-emotional functioning in individuals with ASD, affecting not only school inclusion and transition into professional life (Ashburner et al., 2010; Fage, 2015; Marsh et al., 2017) but also their own and their families' quality of life (Mazefsky and White, 2014; Samson et al., 2014b; Hurd, 2017; Cai et al., 2018; Nuske et al., 2018). Emotion regulation (ER) can be defined as the attempt to influence which emotions one has, when one has them and how one experiences and expresses them (Gross, 1998). ER plays a key role in socio-emotional development, and the few interventions designed to strengthen this skill have been beneficial for individuals with ASD (Reyes et al., 2019; Sandbank et al., 2020). Inspired by an apparent increasing awareness among researchers and clinicians regarding the need to attenuate ER impairments in individuals with ASD and the few but beneficial interventions, this study describes the development and the first evidence of a training program to increase adaptive positive ER strategies, i.e., strategies that aim at upregulating positive emotions.

Research studies and interventions mainly focus on downregulating negative emotions and much less on upregulating positive emotions. However, researchers have begun to recognize the benefits of positive ER, such as alleviating the undesirable effects of negative emotions, broadening the repertoire of resources, promoting resilience, and contributing to wellbeing (Fredrickson, 2004; Gross et al., 2006; Tugade and Fredrickson, 2007; Livingstone and Srivastava, 2012; Carl et al., 2013; Hechtman et al., 2013). Although a nascent field, several positive ER interventions have shown favorable outcomes in clinical (depression and anxiety) and non-clinical populations (Hechtman et al., 2013; Weytens et al., 2014; Fussner et al., 2015; Quoidbach et al., 2015; Taylor et al., 2016). Certain ER strategies have been found to support positive ER (Langston, 1994; Bryant, 2003; Gable et al., 2004; Quoidbach et al., 2010, 2015). First, attentional deployment strategies (e.g., immersion in the present moment, savoring, and vivid visualization of pleasant activities) seem to be efficient in increasing positive emotions and life satisfaction. Second, cognitive change strategies (e.g., positive appraising of events and looking at the bright side of an event by minimizing its negative effects) were highly efficient in inducing or increasing the intensity of positive emotions. Finally, response modulation strategies (e.g., smiling, laughing, and capitalizing – sharing with others) have also had encouraging outcomes. Response modulation strategies occur after the activation of the emotional response and directly impact the physiological, behavioral, or experiential component of the emotion (for a review, see Quoidbach et al., 2015).

In addition, humor can also be used as a distinct strategy to regulate emotions (Samson and Gross, 2012; Horn et al., 2018; Perchtold et al., 2019), either as a way of distracting oneself from negative emotions (i.e., an attentional deployment strategy; Strick et al., 2009), or as a way to reappraise events

(i.e., as a cognitive change strategy; Samson et al., 2014a; Kugler and Kuhbandner, 2015). Therefore, humor can be considered a multifaceted adaptive strategy to regulate emotions, sharing characteristics with different ER strategy categories. In the current paper, however, the use of humor is referred to as a separate strategy meant to attain positive ER goals.

Using various methodologies, cognitive reappraisal (a cognitive change strategy aiming at reinterpreting the meaning of an emotional situation in order to change the subsequent emotion) and expressive suppression (a response modulation strategy aiming at not displaying any emotional response) are the most studied ER strategies in ASD. The use of cognitive reappraisal is linked to long-term beneficial outcomes, whereas the frequent use of expression suppression is linked to long-term detrimental outcomes including higher levels of distress or depression (Gross and John, 2003; Aldao et al., 2010; Schäfer et al., 2017). Individuals with ASD seem to use cognitive reappraisal less spontaneously and with reduced efficacy than typically developing individuals (Samson et al., 2012, 2015b,c). Some studies show a more frequent use of expressive suppression in ASD (Samson et al., 2012, 2015c), while others show similar levels compared to typically developing participants (Samson et al., 2015a,b).

Only a few studies have explored positive emotions in ASD, reporting that the experience and expression of positive emotions in individuals with ASD is attenuated (Dawson et al., 1990; Jaedicke et al., 1994; Hirschler-Guttenberg et al., 2015) and might even be linked to symptom severity (Macari et al., 2018). Parent reports have indicated that children with ASD experience less amusement than their typically developing peers (Samson et al., 2015c). However, adult participants with ASD reported similar levels of positive emotions compared to typically developing participants (Samson et al., 2012). Authors assumed that this unanticipated result was due to the use of emotion-related questions that were context free (and not only limited to social contexts, in which comparatively lower levels of positive emotions could be expected in ASD). To our knowledge, only one study has investigated both the experience of positive emotions and ER in youth with ASD (Samson et al., 2015c). Therefore, any conclusions about the link between these two concepts are still hard to be drawn.

These inconsistent findings on ER strategies and positive emotions may be explained not only by individual differences in the general ASD population, but also by methodological differences between studies including the differences between self and caregivers' reports (Cai et al., 2018). The difficulty to reliably report the emotional experience and expression of individuals with ASD might partially be related to the reduced emotional coherence (i.e., coordinated changes across emotional response systems: subjective experience, expression, and physiology) found in individuals with ASD in experimental paradigms inducing negative emotions (Costa et al., 2017). Emotional response incoherence in ASD is also observable in the context of positive emotions, or more explicitly, in relation to amusement and laughter toward humorous stimuli (Weiss et al., 2013). Several other studies support the idea of the presence of emotional incoherence in ASD. It has been shown that individuals with ASD tend to have flat affect (Yirmiya

TABLE 1 | Sample characteristics.

	Training Group (N=14)	Waitlist group (N=16)	Statistics
	M (SD)	M (SD)	
Age (years)	17.79 (6.52)	18.44 (6.37)	$t(28) = -0.28, ns$
SRS-2 (T-score)	74.14 (10.20)	78.31 (7.37)	$t(28) = -1.30, ns$
AQ-Short (Total Score)	78.79 (11.64)	82.75 (6.22)	$t(28) = -1.18, ns$
Parents' education level ^a	3.32 (0.61)	3.02 (0.88)	$t(28) = 1.03, ns$
Parents' income level (CHF) ^b	5.38 (1.66)	5.29 (2.13)	$t(25) = 0.13, ns$
Participants' educational background (M)^c			
General/Special	7/7	8/8	$\chi^2(1,30) = 0, ns$
Therapy (M)^d			
Yes/No	10/4	10/6	$\chi^2(1,30) = 0.27, ns$
Assistance during intervention (M)			
Experimenter/Alone	10/4	13/3	$\chi^2(1,30) = 0.40, ns$

^aAnswers choices ranged from 1 = compulsory education to 4 = university.

^bData available for 27 participants ($N_{\text{training}} = 13$; $N_{\text{waitlist}} = 14$). Three parents chose to not answer the question. Answers choices ranged from 1 = less than 15000CHF to 10 = more than 240000CHF.

^cGiven the variability of practices across participants and country regions, special education represents here the number of participants who have had one of the following interventions at any time during their education: special education classroom, special education teacher or aide, adapted curriculum or program, reduced number of students in classroom, or inclusive classroom.

^dThe types of therapy that participants were following at the moment of the intervention include one or more of the following types: occupational therapy, speech therapy, psychological or psychiatric counseling or psychotherapy, or/and psychomotor education. One participant completed the self-reported forms.

et al., 1989) and portray reduced facial expressivity of emotions (Owada et al., 2018), which may at times be perceived as unusual (Grossman et al., 2013; Faso et al., 2014), or as less context-appropriate (Begeer, 2005; Weiss et al., 2013; Costa et al., 2017). Given these rather atypical characteristics, individuals with ASD may benefit from interventions focused on positive ER strategies (e.g., response modulation), helping them enrich their emotional experience (Cai et al., 2018), and engage in and savor positive activities (Carl et al., 2013; Bower, 2015; Taylor et al., 2016).

Interventions incorporating an ER component, such as mindfulness, cognitive behavioral therapy, and dialectic behavioral therapy, have been shown to be beneficial to individuals with ASD, but mostly in young children (Scarpa and Reyes, 2011; Weston et al., 2016; e.g., Conner et al., 2019; Factor et al., 2019; Hartmann et al., 2019; Rispoli et al., 2019). Primarily oriented to reduce negative emotions (e.g., anxiety and anger), these programs implicitly employ strategies linked to attentional deployment and cognitive change (Moyal et al., 2014). Yet, to our knowledge, positive ER tools have not been tested in individuals with ASD.

The goal of the current proof of concept study was to develop a psycho-educational program to explicitly train adaptive positive ER strategies in individuals with ASD and provide the first data testing its practical potential and efficacy. The three-session multimedia program sought to broaden the ER repertoire with a particular focus on positive emotions. Three main adaptive ER strategies were targeted as: attentional deployment, cognitive change, and response modulation. Additionally, the training briefly presented humor as an ER strategy. Our first goal was to test acceptability of the program: Participants' satisfaction with the program was assessed after each session, and dropouts and aversive events were reported throughout the sessions as indicators of acceptability of the training program. Second, we examined the preliminary effects of the program on the

subsequent use of ER strategies: We expected increased self-reported use of the three main strategies post-training and hypothesized that this increase would maintain over time. We have also examined exploratorily the effect of the program on the use of humor as an ER strategy.

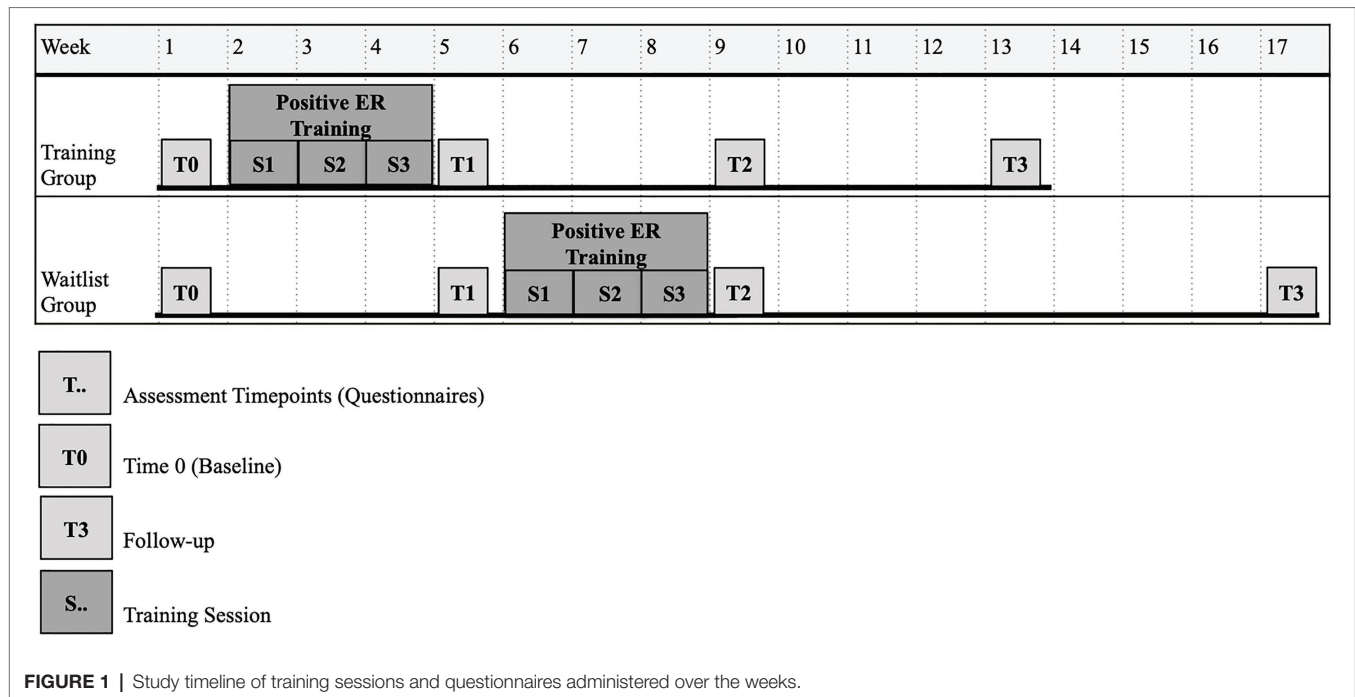
MATERIALS AND METHODS

Participants

Thirty French-speaking male participants with ASD took part in the study ($N_{\text{training}} = 14$; $N_{\text{waitlist}} = 16$) without compensation. Groups did not differ significantly in age, socioeconomic status (i.e., the average of parents' income and education level), participants' educational background, or enrollment in therapies, nor on parent-reported symptom severity (Social Responsive Scale-2, SRS-2; Constantino and Gruber, 2012) or autistic traits (Autism Spectrum Quotient Short; AQ-short; beside Hoekstra et al., 2011, Bastien (n.d.), unpublished). Participants were either enrolled in school ($N = 18$), apprenticeship programs ($N = 8$), and university ($N = 2$) or were in a transition period after finishing school ($N = 2$). See **Table 1** for more details.

Procedure

Participants and, when available, parents were interviewed and participants were screened for inclusion criteria, such as comprehension of verbal instructions, ASD diagnosis established by a qualified healthcare provider, and confirmation of ASD symptomatology (SRS-2 and AQ-short). Twenty-eight participants fell within the clinical range on both scales, the two other participants on one. Using a waitlist control group design, participants were quasi-randomly attributed to either a training group or waitlist group, depending on their time schedule availability. Written informed consent was obtained by participants aged 18 or above and by the parents for participants aged below 18 years



old or under guardianship. The study was approved by the local ethics committee. The three interactive sessions of 45 min each were presented on a computer and administered individually. After each session, participants reported their satisfaction with training and received handouts with examples of exercises that they had tried during training and could also be practiced at home. Participants completed the self-report questionnaires (at four time points; see **Figure 1**): The training group completed the questionnaires at 7 days before training, and at 7, 35, and 63 days after training; the waitlist group completed the questionnaires at 35 and 7 days before training, and at 7 days and 63 days after training. As shown in **Figure 1**, the training group started the three-session intervention the following week after their first self-report questionnaire assessment (right after T0), and the waitlist group started it the following week after the second self-report questionnaire assessment (after T1). The training sessions were completed with experimenters' assistance only (face-to-face or online) or alone, at home or in our laboratory, depending on each participant's preference, geographical location, and/or their availabilities. The waitlist group received the intervention after the second self-report assessment (see **Figure 1**). The study was conducted between 2016 and 2018, before the sanitary restrictions imposed by the coronavirus (COVID-19) pandemic.

Material

Psycho-Educational Training Program

The training program included a child and an adult version that contained appropriate examples for each developmental age range.

Content

During the first session, participants learned about emotional awareness, malleability of emotions, and ER goals, such as

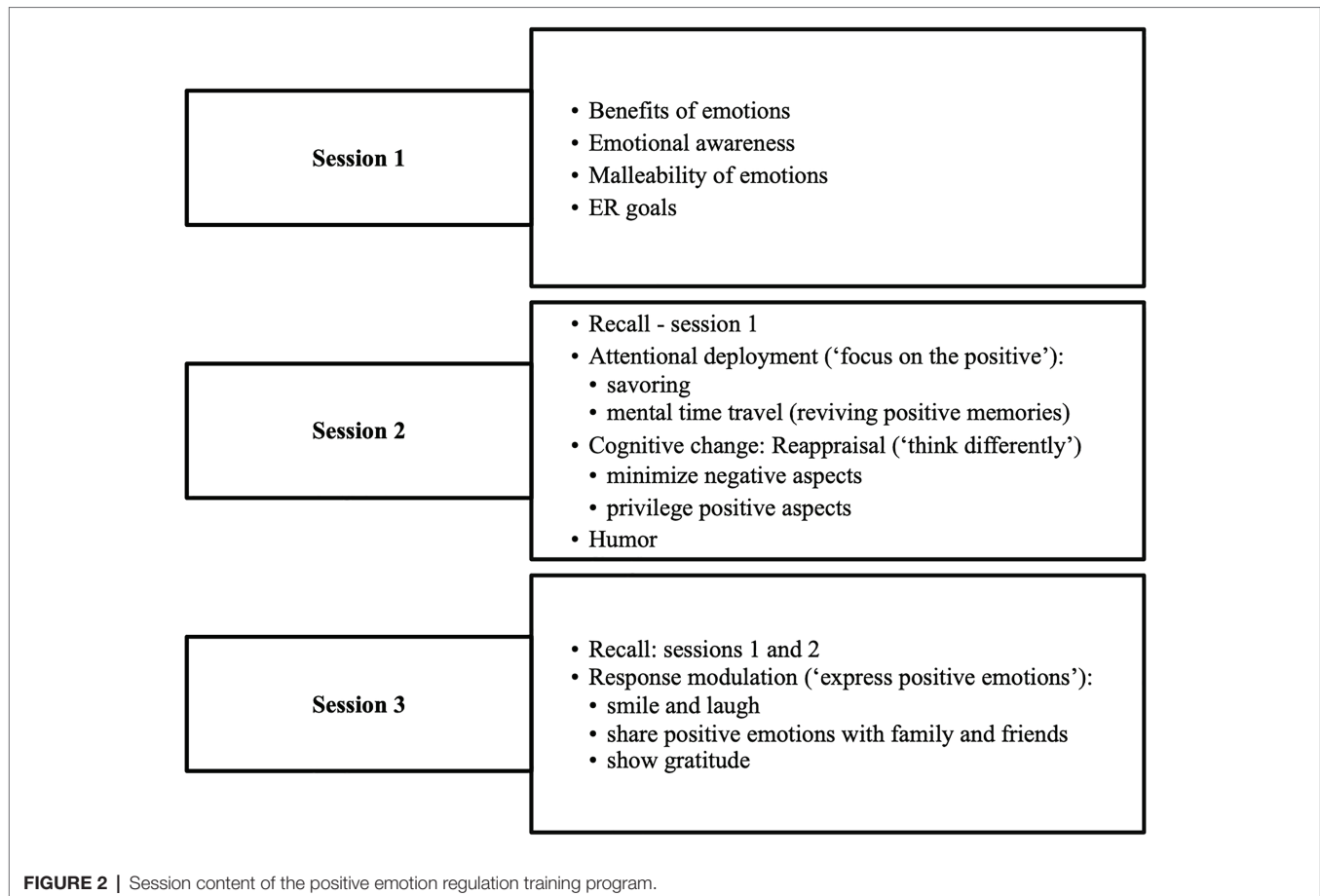
trying to regulate emotions that are unpleasant and unhelpful in a particular context. They learned how emotions emerge, what triggers them, and about their functions and benefits. The second session focused on attentional deployment (referred to as "focus on the positive") and on cognitive change strategies (oriented on cognitive reappraisal - "think differently"), as well as on humor. The third session discussed response modulation strategies ("express positive emotions"). The different techniques used for each strategy are shown in **Figure 2**.

Structure

Each session included theoretical background material, examples, and practical exercises. To facilitate comprehension and render the training interactive, the sessions contained text, images, and animated cartoons created using the online platforms (Moovly - Animation Maker, 2017) and GoAnimate for Schools (Stratton et al., 2014). Examples representing concrete applications of ER in relevant daily life situations (e.g., at school/workplace, with family, or friends) were also shown. Practical exercises included elaborating on participants' own emotional experiences. For example, they were asked to report situations eliciting positive emotions, or to recall positive memories, and were invited to implement ER strategies retrospectively.

Acceptability Measures

After each session, participants were asked to provide feedback about the training program. They evaluated how difficult, interesting, pleasant, and likable the session was. Participants also evaluated the novelty of the exercises, i.e., how often they practice such exercises, as the ones presented in the session, in their daily life. The Likert scale ranged from 1 = "not at all" to 5 = "very much." Dropouts and adverse events were recorded.



Efficacy Measures of ER Strategy Use

Different self-reported subscales were used to assess the use of the three main *ER Strategies*: the Attentional Deployment subscale (six items, $\alpha=0.89$) of the Attentional deployment/Suppression Questionnaire (e.g., “When I want to feel less negative emotion, I fantasize about doing activities that I really enjoy.”; Barros, 2005); the Cognitive Reappraisal subscale (six items, $\alpha=0.74$) of the Emotion Regulation Questionnaire (e.g., “When I want to feel more positive emotions, I change the way I’m thinking about the situation.”; Gross and John, 2003; Gosling et al., 2018); and the Response Modulation subscale (six items; $\alpha=0.49$) which includes two items from the Berkeley Expressivity Questionnaire (Gross and John, 1997), two from the Emotional Expressiveness Questionnaire (King and Emmons, 1990), and two new items specifically assessing positive response modulation (e.g., “Whenever I feel positive emotions, people can easily see what I am feeling”). Regarding the exploratory hypothesis, *Humor* was assessed with four new items ($\alpha=0.51$; e.g., “When I go through negative or unpleasant events, I try to find something funny about the situation to feel better”). The Likert scale used for the responses ranged from 1=“not at all true” to 5=“definitely true.” Given the low Cronbach’s α values at T0 and the higher values obtained at T1 ($\alpha>0.61$), Response Modulation and Humor should be considered with caution.

Data Analysis

Repeated measure MANOVAs, chi-squared, and *t*-tests were run in IBM SPSS Statistics version 26. Multilevel modeling follow-up analyses and standardized coefficients were run in R software, version 3.6 (R Core Team, 2017), using *lmer4*, *lmerTest*, and *parameters* packages (Bates et al., 2014; Kuznetsova et al., 2017; Lüdtke et al., 2020).

RESULTS

Acceptability Indicators

Descriptively, participants rated the training as below scale average on Difficulty ($M=2.26$, $SD=0.99$) and Novelty ($M = 2.06$, $SD = 0.98$) and above average for Interest ($M=3.54$, $SD=0.83$), Pleasantness ($M=3.36$, $SD=0.99$), and Likability ($M=3.46$, $SD=1.02$). Repeated measures ANOVAs run for each question showed no effect of session or group. No dropout nor adverse events were observed during the sessions.

ER Strategy Use

Training Group vs. Waitlist Group (T0 and T1)

First, we expected an interaction effect reflecting increases on the efficacy scores only in the training group. Self-reports for

both time points were available for 29 participants ($N_{\text{training}}=14$; $N_{\text{waitlist}}=15$). Two separate $2 \times 2 \times 3$ MANOVA with two within-subject factors (strategy and time point T0-T1) and one between-subject factor (group) revealed a significant interaction Time point \times Group for the main ER strategies ($F(1,27)=4.31$, $p=0.048$, $\eta_p^2=0.14$) and humor ($F(1,27)=6.61$, $p=0.016$, $\eta_p^2=0.20$). *Post-hoc* between-group analyses showed that the training group reported a more frequent use of the main ER strategies ($M_{\text{training}}=3.68$, $SD=0.60$; $M_{\text{waitlist}}=3.08$, $SD=0.55$, $t(27)=2.83$, $p=0.009$, $d=1.04$) and humor ($M_{\text{training}}=3.32$, $SD=0.87$; $M_{\text{waitlist}}=2.50$, $SD=0.73$, $t(27)=2.76$, $p=0.01$, $d=1.02$) than the waitlist group at T1. *Post-hoc* within-group analyses showed that, in the training group, the increase in the use of the three main strategies from T0 to T1 was only marginally significant ($M_{T0}=3.31$, $SD_{T0}=0.64$, $M_{T1}=3.68$, $SD_{T1}=0.60$, $t(13)=-1.89$, $p=0.08$, $d=0.60$), whereas the increase in the use of humor was significant ($M_{T0}=2.79$, $SD_{T0}=0.74$, $M_{T1}=3.32$, $SD_{T1}=0.87$, $t(13)=-3.05$, $p=0.009$, $d=0.66$). See **Figure 3**.

Entire Sample – Pre- vs. Post-training

Next, we expected an increase in the efficacy scores in the entire sample from pre- (combined T0_{training} and T1_{waitlist}) to post-training scores (combined T1_{training} and T2_{waitlist}). Self-reports for both time points were available for 28 participants ($N_{\text{training}}=14$; $N_{\text{waitlist}}=14$). The two separate MANOVAs showed a significant main effect of time point (pre- and post-training) on the main ER strategies ($F(1,26)=8.51$, $p=0.007$, $\eta_p^2=0.25$; **Figure 4**) and humor ($F(1,26)=8.21$, $p=0.008$, $\eta_p^2=0.24$; **Figure 5**), indicating an overall increase from pre- (7 days before) to post-training (7 days after).

Multilevel Analyses – The Intervention Effect Over Time

Finally, we hypothesized that intervention effects would persist over time. Based on the overfit evaluation (Akaike information criterion), a multilevel linear model (MLM) including time

(i.e., the intervention effect) as a two-level categorical variable (i.e., first level, pre-training, including combined data from 35 and 7 days before training; second level, post-training, including combined data from 7, 35, and 63 days after training) with a main effect of continuous time (two parallel slopes) was retained. The analyses included all available participants' time points ($N=108$). The results showed a main effect of the intervention on the use of the main ER strategies ($F(1,40.65)=10.17$, $p=0.003$, $\beta_z=0.65$; **Figure 4**). Comparison analyses indicated a significant increase at 7 days ($p=0.004$, $\beta_z=0.59$; confirming the previous MANOVAs' results) and 35 days ($p=0.021$, $\beta_z=0.51$) after training, and a marginally significant increase 63 days later ($p=0.068$, $\beta_z=0.37$) compared to 7 days before training. A total of 77% of participants (23 out of 30) reported an increase in the use of the main ER strategies post-training. The intervention effect was also significant for humor: $F(1,78.93)=6.08$, $p=0.015$, $\beta_z=0.51$ (**Figure 5**). The only significant increase in the use of humor was found 7 days after training ($p=0.017$, $\beta_z=0.44$). Both analyses showed a main effect of continuous time at pre- and post-intervention on the main ER strategies: $F(1,48.86)=5.15$, $p=0.003$, $\beta_z=-0.12$ and humor: $F(1,80.15)=4.01$, $p=0.049$, $\beta_z=-0.19$, which could be due to differences in the sample size (35 vs. 7 days before intervention). The results did not change when age was introduced as a covariate.

DISCUSSION

Main Findings Acceptability

Overall, the program has received high evaluations and was proven to be adequate in terms of acceptability. Participants mainly rated the program as easy to understand, interesting, pleasant, and likable. On average, participants indicated that they do not usually use these strategies in their daily lives. The novelty of the information presented during the training

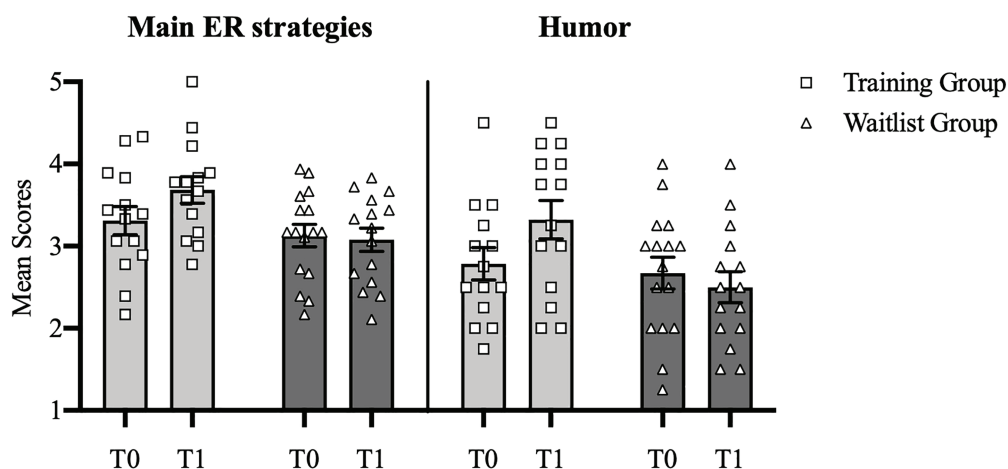


FIGURE 3 | Mean scores of self-reported use of main ER strategies and humor in training versus waitlist group. Error bars represent standard errors.

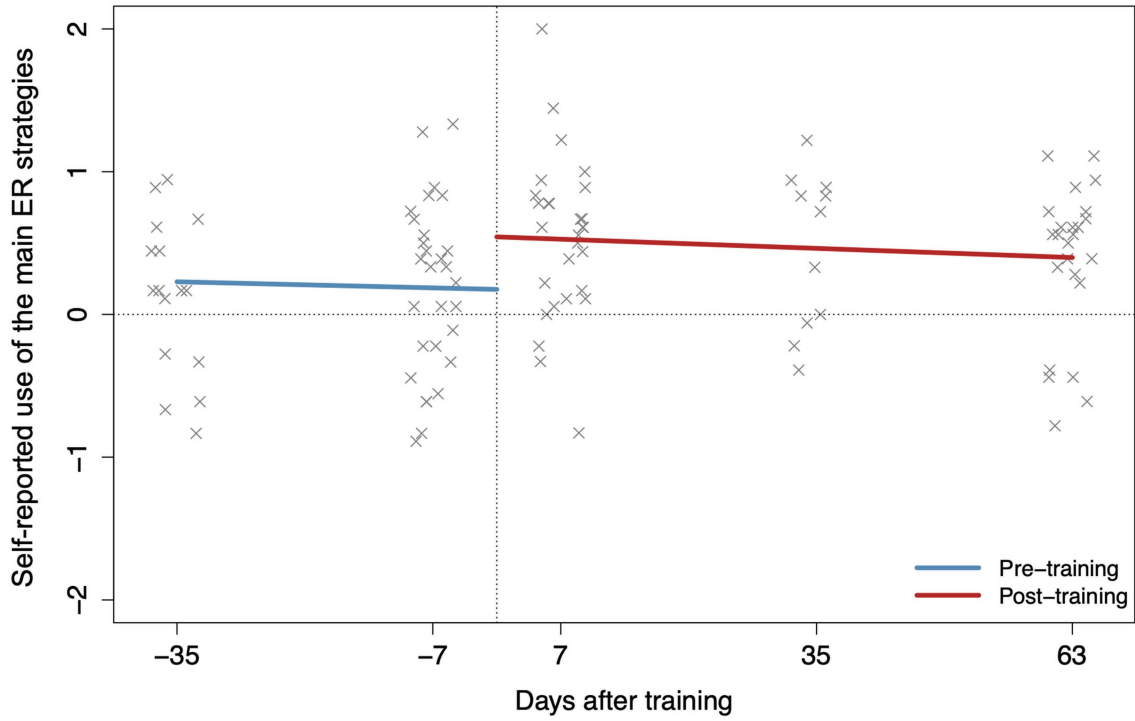


FIGURE 4 | Positive ER training effects over time on use of *main ER strategies* for all the available time points of the entire sample.

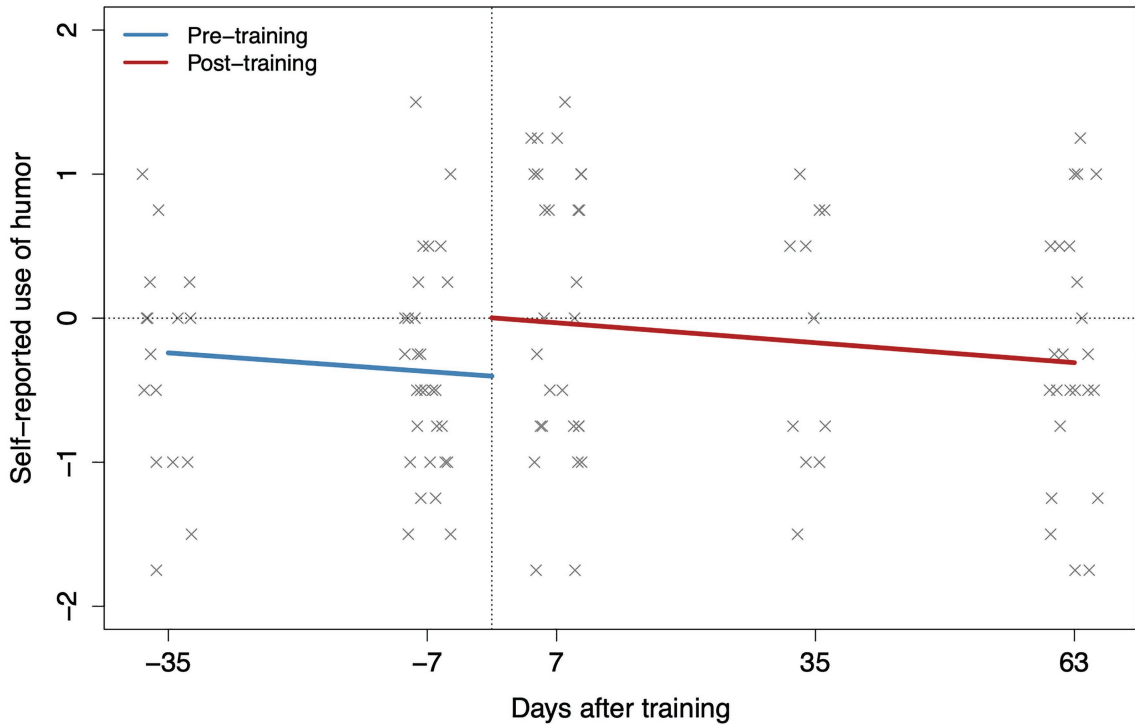


FIGURE 5 | Positive ER training effects over time on use of *humor* for all the available time points of the entire sample.

program might have contributed to the interest that participants have reported throughout the sessions and might explain the full adherence to the program. As no dropouts or adverse effects were observed during sessions, this brief program has proven to have exemplary attrition and safety rates. Although these observations could probably be explained by the brevity of the intervention, they nonetheless encourage further use of such training programs with individuals with ASD.

ER Strategy Use

The current study revealed promising effects of using this psycho-educational training program on positive ER in individuals with ASD. As expected, participants used the three main ER strategy types (attentional deployment, cognitive change, and response modulation) more frequently post-training. This result was confirmed in a larger sample with both groups pooled together when we measured the changes immediately before and after the intervention. Importantly, despite the brevity of the program, the observed effects on the use of the main ER strategies were maintained until at least 7 weeks later. Our findings indicate that individuals with ASD are able to learn new strategies promoting positive emotions. This suggests that they can benefit from interventions targeting the improvement of positive ER skills.

An exploratory analysis also revealed an increase in the self-reported use of humor as an adaptive ER strategy. While this may be interesting, this result should be considered with caution given the unstable Cronbach's alpha of the humor scale which shows low reliability at T0 and high reliability at T1. The change in scale reliability (T0 vs. T1) could be explained by various factors often observed in educational research: the sample homogeneity at T0, the intervention effects (changes between measurements), or the measurement process (activation of new insights about the question; e.g., Taber, 2018). Future research should assess the use of humor as an ER strategy using more reliable scales.

Limitations and Future Perspectives

First, several methodological limitations are worthy of note. One limitation is the relatively small sample size. Yet, although for a proof of concept study, a small sample is appropriate, the intervention should be more rigorously tested in larger samples in order to see whether these initial findings generalize as well as in order to increase the statistical power in the analyses. However, importantly, the effect sizes of the cross-sectional analyses, as well as the standardized coefficients of the MLM analyses (β_2), indicate medium to strong effects of the intervention on the use of the main positive ER strategies and humor. Another methodological limitation is the waitlist control group design. Certain researchers recommend the use of "stronger" designs (e.g., active control groups) which can limit the potential participants' expectation biases and control for non-specific intervention effects (see Kinser and Robins, 2013). However, a waitlist control group design has important advantages: It is more cost-effective, especially in the first phases of testing a new intervention program, and it is more suitable

for ethical considerations, as all participants can eventually benefit from the intervention (see Moore and Ledbetter, 2020). Finally, although the researchers ensured that the subscales contain items easy to understand at all ages, these measures, taken together, should be further validated in young samples and in samples with ASD. For instance, only the Cognitive Reappraisal scale has already been validated in a typically developing child and adolescent population within an age range from 8 to 16 years old (Gosling et al., 2018), whereas the Berkeley Expressivity Questionnaire and the Emotional Expressiveness Questionnaire have been used with children of 14 years of age and older (e.g., Doostian et al., 2015; Akkuş Çutuk, 2021). Overall, the present participants did not report difficulties in understanding the content of the self-reported measures, but they did sometimes report a certain lack of motivation toward the completion of the questionnaire and its repetitiveness over the four time points.

A second limitation is that ASD diagnosis was not confirmed using the gold standards (e.g., ADOS-2; Lord et al., 2012) and neither cognitive skills nor adaptive functioning were objectively assessed. Nonetheless, we believe that our program was proven to be suitable for verbally fluent individuals with ASD, whereas assistive technologies (e.g., smartwatch; Torrado et al., 2017) may be more appropriate for minimally verbal individuals with ASD.

Third, gender and age differences may be important. Extending this research to females could improve understanding of ER in individuals with ASD (Trubanova et al., 2014; Cai et al., 2018). Not only is ASD under-identified in females (Rynkiewicz et al., 2016), it has also been suggested that emotion dysregulation could represent a key factor contributing to the unrepresentative ASD symptomatology in females (Trubanova et al., 2014). Differences between males and females in the use of ER strategies have also been found in typically developing populations (Cai et al., 2018). To date, only one study has examined this topic and found that females with ASD had slightly more emotion regulation difficulties compared to males with ASD: They were more prone to experience dysphoria and faced more impairments related to high emotional intensity (Trubanova Wieckowski et al., 2020). Future studies should explore the efficacy of such interventions in female individuals with ASD. Furthermore, as ER patterns change with age (Samson et al., 2012; Cai et al., 2018), identifying the most frequently used ER strategies and the specific ER impairments at each developmental stage could help provide a more individualized use of interventions. Although the literature suggests that the adaptive ER strategies are the same across development (Aldao et al., 2010; Schäfer et al., 2017), we would expect certain developmental differences in the frequency of use and efficacy of these strategies (Garnefski et al., 2002).

Also, while the data indicate a more frequent use of ER strategies after the training, it remains unknown how well people successfully completed the ER phases in their daily life (e.g., strategy selection and implementation; Gross, 2015). Previous research has shown that the flexible use of ER strategies is worthy of further investigation, as it might be a key factor contributing to an adaptive ER and influence ER efficacy (Aldao et al., 2015; Ford et al., 2019; Kobylińska and Kusev, 2019). Multi-method

approaches using performance tasks (Samson et al., 2015b), virtual reality (e.g., Ip et al., 2018), and physiological measures as well as daily diaries or ecological momentary assessments could be of help to test the flexible use of various ER strategies across different contexts in individuals with ASD (Cai et al., 2018).

While this study shows high acceptability rates and promising first effects on the increased use of adaptive positive ER strategies post-training, future research should examine the impact on proximal and distal outcome measures (e.g., emotion experience, wellbeing, and socio-emotional functioning) with appropriate scales to capture changes (Samson et al., 2012; Vermeulen, 2014) in larger efficacy studies. A higher and more improved impact of the intervention is expected to occur after upgrading the current version into an intensive program with an increased number of sessions, while considering the likelihood that the dropout rates might increase. A closely monitored practice between sessions could also be more impactful and help measure adherence to the program, in addition to the acceptability measures that have already shown highly satisfactory results. Finally, adapting the program into a caregiver-mediated intervention could also contribute to obtaining better outcomes, especially in younger participants (Rispoli et al., 2019).

Conclusion

This first version of our positive ER training has been shown to be participant-friendly and appropriated for individuals with ASD, and indicated promising preliminary effects on the participants' self-reported use of adaptive ER strategies after the training program. This new program could be a valuable tool for practitioners and clinicians to train ER skills. It could also supplement the need for online intervention tools, not only in times when sanitary restrictions require the implementation of remote sessions to support patients with developmental disorders (e.g., COVID-19; Grumi et al., 2020), but also to facilitate, in general, the delivery of care beyond it (Jeste et al., 2020). The findings of the current proof of concept warrant future research on this topic, which could shed more light on the generalizability of the outcomes and the role that positive ER plays in the onset, manifestation, and development of challenging behaviors in individuals with ASD. Importantly, it will be necessary to examine the impact of the training on positive emotions in individuals with ASD. Adaptive emotion regulation skills as well as positive emotions may play an important role in social and adaptive functioning including school inclusion, education, and transition into a professional life as well as wellbeing in individuals with ASD.

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DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The study was performed in accordance with the Declaration of Helsinki and was approved by the Swiss Ethical Committee Board of Geneva (Date 01.03.2016/No. PB_2016-00750/15-242). Written informed consent to participate in this study was provided by the participants aged 18 or above and by parents for participants aged below 18 years or under guardianship.

AUTHOR CONTRIBUTIONS

AS developed the design of study, acquired funding, and supervised the study. DS contributed to the study conception and design. AZ administered the project, prepared the research material, contributed to the training program content, organized the database, performed the statistical analysis, and wrote the first draft of the manuscript. Data collection was performed by AZ, KN-K, and NB. All authors reviewed and commented the previous versions of the manuscript, and read and approved the final manuscript.

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Teaching Simple Strategies to Foster Emotional Well-Being

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The COVID-19 pandemic has presented considerable disruptions to routines that have challenged emotional well-being for children and their caregivers. One direction for supporting emotional well-being includes strategies that help children feel their best in the moment, which can bolster their capacity to respond appropriately to thoughts and behaviors. Strengthening emotional well-being equitably, however, must include opportunities in settings that are easily accessible to all, such as schools. In this paper, we focus on simple, evidence-informed strategies that can be used in schools to promote positive feelings in the moment and build coping behaviors that facilitate tolerance of uncertainty. We focus on those strategies that educators can easily and routinely use across ages, stages, and activities. Selected strategies are primarily tied to cognitive behavioral theory, with our review broadly organized across categories of self-awareness, self-soothing, and social relationships. We review evidence for each, providing examples that illustrate ease of use in school settings.

Keywords: emotional well-being, kernels, school-based strategies, coping strategies, positive emotion, cognitive behavioral therapy

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INTRODUCTION

Though definitions of emotional well-being (EWB) vary (Center for Disease Control and Prevention, 2018; Feller et al., 2018; National Institute of Health, 2021), it is generally agreed that EWB is comprised of multiple dimensions that reflect how an individual feels in the moment, generally, and about life. Our life events and experiences (e.g., language, art/music, noises, and faces) can be placed along an emotion continuum from positive to negative affective quality. This continuum in which a stimulus is felt as pleasing or displeasing is referred to as emotional valence. When we feel our best self, our emotional valence is generally positive. Emotional valence is critical for representing and categorizing human experiences and serves to influence behavior and cognition (Kauschke et al., 2019). As such, becoming aware of feeling in the moment – such as paying attention to physical sensations of emotional states – is key to changing thoughts and behaviors. In fact, interventions designed to increase positive emotion have been shown to increase behavioral and cognitive repertoires (Isen, 1987; Fredrickson and Branigan, 2005; Fredrickson et al., 2008; Schutte, 2014). Researchers have suggested that optimal emotional well-being occurs when positive affect is experienced by individuals at rates three times more than negative (Diehl et al., 2011). In addition, for those exposed to chronic stress, engaging in strategies that evoke positive emotion can disrupt the accumulation of, and sensitization to, chronic stress. Thus, identifying how to invoke positive emotion in the moment

and sustain it over time is critical to well-being (Sheldon and Lyubomirsky, 2006). In this paper, we focus on simple strategies that can be used in schools to promote positive feelings in the moment and serve to build coping behaviors to facilitate tolerance of uncertainty.

Strategies to Promote EWB

Cognitive behavioral therapy (CBT) is a commonly used intervention framework for mental health intervention to promote EWB (Early and Grady, 2017). CBT draws from both cognitive and behavioral theory, each of which brings a different focus. Cognitive theory centers around how thought impacts emotions and behavior, and behavioral theory focuses on how factors in the environment cue and reinforce behavior (Early and Grady, 2017). The interplay of the two theories situates a person and their internal world within the external environment, acknowledging how both internal and external factors influence an individual’s behavior. CBT practice models go beyond the integration of cognitive and behavioral theories to include focus on the multidirectional influence of affect (emotion), behavior, and cognition (thought; Early and Grady, 2017). Given this multidirectional interplay, intervention strategies are therefore focused on changing emotions, behaviors, or thoughts as changing one aspect will influence the others.

CBT is used as the foundation for many interventions that seek to promote EWB in U.S. schools. For example, a recent systematic review found that a majority of resilience-building interventions in schools were based on CBT (Dray et al., 2017). The popularity of CBT may be due to the established effectiveness as an intervention (Benjamin et al., 2011). A recent review of meta-analyses and systematic reviews, for example, reported small to medium effect sizes for the effectiveness of short-term school-based CBT programs for anxiety prevention and resilience building, such as the *FRIENDS* program (Šouláková et al., 2019). We acknowledge that CBT is just one of many therapeutic approaches but focus on it due to its predominance in existing school interventions.

Although school-based CBT programs are effective, there are challenges when attempting to disseminate these programs “widely and effectively” in schools in ways that can benefit all children (Embry and Biglan, 2008, p. 75). Although universal mental health interventions in schools have begun to integrate CBT-based approaches (Dray et al., 2017), these interventions are typically targeted to children requiring support for a specific diagnosis or concern as opposed to proactive implementation as a promotion strategy for the general population (Creed et al., 2016). In addition, implementing a school-based CBT program at a large scale and maintaining fidelity can be challenging given resources (e.g., dedicated staff, time, and financial investment) necessary to put in place in a way that can universally impact well-being (Embry and Biglan, 2008). Having classroom teachers deliver CBT interventions could maximize access to universal strategies (Forman and Barakat, 2011), yet available intervention protocols in the United States often require advanced training to build the knowledge and skills to enable successful implementation.

Given estimates suggesting a doubling of rates of anxiety and depression among children and adolescents during the global pandemic (Racine et al., 2021), these challenges to implementing universal well-being promotion in schools are particularly concerning in pandemic. Social isolation and disruption to routines have been noted as contributors to the increased prevalence of mental health challenges, with tolerance for uncertainty identified as a predictor of anxiety and depression among adults during the COVID-19 pandemic (Rettie and Daniels, 2021). Tolerance for uncertainty refers to ability to engage in positive coping behaviors during times of uncertainty. Given the importance of tolerance for uncertainty, schools need capacity to implement universal strategies that can facilitate positive coping behaviors.

Promoting tolerance for uncertainty does not necessitate complex and intensive intervention packages, with adaptive coping involving use of tools such as humor and social connection. Along these lines, child and adolescent intervention researchers have been working to identify “active ingredients,” that is, those core components of intervention that lead to behavioral change. Active ingredients in intervention for youth with anxiety and depression, for example, include strategies such as behavioral activation, physical activity, mental imagery, and social relationships (Wolpert et al., 2021). In a similar vein, Embry and Biglan (2008) proposed the term “kernels” to refer to these fundamental units of behavior influence (77), with recommendations to extend use beyond treatment to universal promotion and prevention of well-being. Their review identified common elements of evidence-based programs, referring to each strategy as an evidence-based kernel. Examples of evidence-based kernels include nasal breathing, self-monitoring, and praise (Embry and Biglan, 2008; Chafouleas et al., 2020).

In this paper, we focus on kernels, or active ingredients, of CBT-based interventions that can be proactively and easily used in schools to promote EWB. Wolpert et al. (2021) identified active ingredients in intervention for youth with anxiety and depression within six broad groups (see **Table 1**). We organize our paper using three broader categories of active ingredients: self-awareness (e.g., psychoeducation and cognitive restructuring), self-soothing (e.g., relaxation strategies), and social relationships. We conceptualize these categories as capturing each of Wolpert

TABLE 1 | A crosswalk of our categories and Wolpert et al.’s (2021) categories of active ingredients.

Wolpert et al.’s (2021) Categories of Active Ingredients	Our Categories of Simple Strategies		
	Self-Awareness	Self-Soothing	Social Relationships
Behaviors and Activities		X	X
Beliefs and Knowledge	X		
Brain and Body Functions		X	
Cognitive and Attentional Skills	X	X	
Human Connections			X
Socioeconomic Factors			

An “X” indicates overlap between our categories and Wolpert et al.’s (2021) active ingredients. Examples of “socioeconomic factors” as defined by Wolpert et al. (2021) include economic transfers and access to green space. Given that we are focused on simple school-based strategies, this is not explicitly addressed in our categories.

et al.'s categories that can be addressed in schools; this alignment between can be found in **Table 1**. Our selected categories reference simple strategies that educators can easily and routinely use across ages, stages, and settings to enable children to feel their best self in the moment and build positive coping behaviors.

Next, we review evidence behind these three categories and highlight simple strategies within each that promote positive feeling in the moment. We offer examples to adapt the simple strategies to be universally accessed by children across ages and easily embedded within the learning environment. See **Table 2** for a summary.

SELF-AWARENESS

Definitions of self-awareness may emphasize paying attention to oneself to facilitate self-knowledge and enable awareness and evaluation of thoughts and feelings or may focus on awareness of one's own internal states and how these states are influenced by others and one's environment (Feize and Faver, 2019), and associated strategies promote awareness of one's thoughts and feelings, understanding of how thoughts and feelings influence behavior, and awareness of how one's thoughts, feelings, and behavior impact themselves and others.

Self-awareness has shown to be important for enhancing EWB. For one, a lack of awareness of one's own emotions has been associated with increased likelihood of internalizing symptoms and, ultimately, development of internalizing disorders (Sendzik et al., 2017; Van Beveren et al., 2019). Low emotional awareness has also been associated with more externalizing problems, particularly for children with attention-deficit/hyperactivity disorder (Factor et al., 2016). For youth, better emotional self-awareness has shown to predict adaptive emotional regulation (Van Beveren et al., 2019).

As shown in **Table 2**, one simple strategy to promote self-awareness is psychoeducation. Psychoeducation is well-established as an effective intervention and has been associated with positive outcomes for children and adolescents (Lukens and McFarlane, 2004; Tanaka et al., 2020; Noble et al., 2021). Although there are many conceptualizations of and ways to deliver psychoeducation, strategies broadly involve educating an individual about their own emotional states, including internal and external influences of these states and coping strategies that promote adaptive functioning. For example, psychoeducation as a simple strategy might include mini-lessons that can be integrated into academic subjects, such as reading and writing, on how to recognize emotions in oneself and others (e.g., what it looks and feels like to be sad, happy, angry). Another strategy involves cognitive restructuring, which is a key component of CBT-based intervention packages. Cognitive restructuring strategies teach individuals to identify, evaluate, and shift unhelpful thoughts (Clark, 2013). Two examples of cognitive restructuring are affirmations (i.e., positive statements about one's self-worth; Nelson et al., 2014) and acknowledging (i.e., reminding oneself of previous success). As a simple strategy, cognitive restructuring might look like recurring brief activities (e.g., 5-min lessons before introducing new academic concepts)

that teach and reinforce how to shift overwhelmed or frustrated thoughts to be more positive. For example, a teacher could ask children to remember a time when they were successful with a challenging task. Then, teachers can discuss how when feeling overwhelmed with a new challenging task, students can think about their previous success to shift their thoughts to be more positive. Through psychoeducation and cognitive restructuring strategies, an individual can better understand their thoughts and feelings, appropriate responses to positively or negatively valenced situations, and strategies for shifting their thoughts.

SELF-SOOTHING

The acquisition of self-soothing skills begins in early childhood (e.g., thumb sucking and rocking) and can be taught and learned across the life course (Murray et al., 2015). Self-soothing refers to an individual's efforts or ability to calm themselves when emotionally distressed and during the resultant autonomic nervous system arousal (Wright, 2009). Emotional distress can result from feelings of fear, embarrassment, or anger. When individuals are emotionally distressed, the nervous system perceives threat and works to protect the individual (i.e., activating the sympathetic nervous system or "fight or flight"; Kozłowska et al., 2015). Common nervous system responses are increased heart and breathing rates, tightened muscles in preparation for self-defense, and narrowed attentional focus on the source of distress (Perry et al., 1995; Gable and Harmon-Jones, 2010; Kozłowska et al., 2015). In addition, the neocortex, the area of the brain responsible for higher-order thinking (e.g., planning and inhibition), becomes less active (Perry et al., 1995).

When individuals are distressed, they have minimal cognitive energy to devote to new tasks (Perry et al., 1995). Therefore, self-soothing activities focus on calming the nervous system (Wright, 2009). These activities can soothe by helping to slow rapid heart rate and breathing and relax muscles. They also shift attentional focus from the source of distress, which can be particularly important for individuals to regain a sense of calm. When distressed, shifting attentional focus can be facilitated through strategies that engage the senses (Linehan, 1993) or rhythmic and repetitive movement (Perry, 2009). Rhythm and repetition calm the nervous system by restoring bodily rhythms that promote a sense of safety. Self-soothing kernels facilitate the reactivation of the parasympathetic nervous system (i.e., "rest and digest"), allowing individuals to calm from distressed states and reengage with the broader environment. Positive self-soothing skills have been associated with improved emotional regulation, social interactions with peers, and on-task behavior (Wyman et al., 2010).

Self-soothing skills are important in school environments, helping children to respond to distressing situations (e.g., embarrassment or rejection and feelings of failure or incompetence) and return to learning and optimal levels of engagement with the environment (Cicchetti et al., 1991). Importantly, self-soothing skills can be taught and practiced

TABLE 2 | Simple strategies to promote child self-awareness, self-soothing, and social relationships.

Category	Simple Strategy	Example Adaptation
Self-Awareness	<ul style="list-style-type: none"> • Psychoeducation 	<ul style="list-style-type: none"> • Mini-lessons that can be integrated into academics (e.g., reading, writing) on how to recognize emotions in oneself and in others
	<ul style="list-style-type: none"> • Cognitive Restructuring (e.g., affirmations, acknowledgments) 	<ul style="list-style-type: none"> • Recurring brief activities that teach shifting unpleasant thoughts to more pleasant thoughts
Self-Soothing	<ul style="list-style-type: none"> • Breathing techniques 	<ul style="list-style-type: none"> • Belly breathing, in which a child breathes in deeply to inflate their stomach, holds the breath, and then exhales to deflate their stomach
	<ul style="list-style-type: none"> • Movement 	<ul style="list-style-type: none"> • Allowing opportunities for physical activity throughout the day
	<ul style="list-style-type: none"> • Visualization 	<ul style="list-style-type: none"> • Before a math test, walking the class through an exercise in which they visualize their success on the assessment
	<ul style="list-style-type: none"> • Stretching 	<ul style="list-style-type: none"> • 5-min yoga practice after returning from recess
	<ul style="list-style-type: none"> • Progressive Muscle Relaxation 	<ul style="list-style-type: none"> • Using a script, teacher leads the class through tightening and releasing muscle groups
Social Relationships	<ul style="list-style-type: none"> • Gratitude 	<ul style="list-style-type: none"> • During art class, children create a drawing to give to a teacher or classmate for whom they are grateful
	<ul style="list-style-type: none"> • Acts of Kindness 	<ul style="list-style-type: none"> • Have children create “tootle” notes, in which they write compliments to a peer
	<ul style="list-style-type: none"> • Seeking Social Support 	<ul style="list-style-type: none"> • 5-min lesson during morning meeting about when and how to share their feelings with a trusted individual

when individuals are calm and regulated. This allows for processing and learning of the strategies and the development of habits that can be subsequently used during times of emotional distress. In addition, self-soothing skills that are embedded into daily routines (e.g., regularly beginning classroom lessons with children taking five deep breaths) are more likely to be practiced (National Academies of Sciences, Engineering, and Medicine, 2019). Strategies, including breathing techniques, movement, visualization, stretching, and progressive muscle relaxation, facilitate self-soothing. In **Table 2**, example universal adaptations for each of these simple strategies are provided. For example, breathing techniques as a simple strategy might look like teaching belly breathing to all students, where they breathe in to inflate the stomach, hold for 5 seconds, and release the breath to deflate the stomach.

SOCIAL RELATIONSHIPS

Social relationships are trusted connections in which support is given or received. Early in the life course, infant and young children's closest social relationships are typically with their caregivers and close family members. As children begin to engage with childcare or schooling, these relationships often grow to include teachers, peers, coaches, and other important adults in their lives. Across the life course, positive social relationships are key to healthy development and EWB (Osher et al., 2020).

Positive social relationships have many positive effects on children and classrooms. When met with validating and patient

responses, positive social interactions help children process and respond to their feelings (Thompson and Meyer, 2007). In addition, they may foster a sense of emotional closeness and reinforce feelings of trust between the child and teacher, parent, guardian, or friend (Buhrmester, 1990; Shulman et al., 1997; Thompson and Meyer, 2007; Brown, 2013). For example, positive child-teacher relationships promote self-regulation, which can improve classroom behavior and classroom climate (Osher et al., 2020). Teachers' efforts to build strong, quality relationships with children are a priority. This requires intentional effort and can be challenging with children displaying disruptive or withdrawn behaviors or in middle and high school contexts where teachers typically work with many children for shorter periods of time (i.e., due to rotating classes and semester scheduling). However, it is particularly important in these contexts: positive relationships with others can buffer and repair areas of the brain impacted by trauma (National Academies of Sciences, Engineering, and Medicine, 2019), and relationships with competent and caring adults are critical for brain and psychosocial development during adolescence (Immordino-Yang et al., 2018; Osher et al., 2020).

Social relationships can be cultivated through expressions of gratitude, offering kindness in words or actions, and seeking social support. These strategies within the social relationships category are outlined in **Table 2**. Literature reviews and meta-analyses find that gratitude is strongly associated with social relationships, pro-social emotions, and well-being across the life course (Wood et al., 2010; Ma et al., 2017). Gratitude interventions can be particularly beneficial for children and adolescents with lower levels of positive affect (Froh et al., 2009)

and have been associated with improved school satisfaction (Froh et al., 2008). Gratitude as a simple strategy might look like having children create a special drawing to give to an adult or peer for whom they are grateful. Relatedly, acts of kindness – where children offer kind words or actions to others – have been found to be highly beneficial for the *giver* in addition to the receiver. For example, performing acts of kindness is associated with increased happiness in young children (Aknin et al., 2012) as well as increased well-being and peer acceptance in elementary school children (Layout et al., 2012). Importantly, performing acts of kindness has stronger effects for the giver when they provide opportunities for social connection (Aknin et al., 2012). As an example of acts of kindness as a simple strategy, children may be instructed to create “tootle” notes for peers during morning meeting. Finally, seeking emotional support, in which children share feelings (e.g., sadness, nervousness) with a trusted teacher, parent, guardian, or friend, can foster social relationships and improve EWB (Umberson and Montez, 2010). For example, as a simple strategy, a child might be taught by a caregiver when and how to express their emotions to a trusted individual.

DISCUSSION

In this article, we reviewed evidence for the importance of self-awareness, self-soothing, and social relationships for universal promotion of EWB in child populations. We summarized simple strategies within each category, sharing how each can be used by educators to promote EWB by facilitating adaptive coping strategies and strengthening tolerance for uncertainty.

Educators need simple strategies in their everyday toolbox for several reasons. First, they are taxed for time and resources, needing to teach a great deal of content and skills to children over the course of each school year. Barriers to existing SEB curricula include cost, time required for teaching content, and staff training requirements (Embry and Biglan, 2008; Creed et al., 2016). Relatedly, though high-quality professional development is needed to deliver current SEB curricula (National Academies of Sciences, Engineering, and Medicine, 2019), implementation remains scarce, and the quality and duration of this training vary widely (Jennings and Frank, 2015). Second, there is a need to promote EWB and increase tolerance for uncertainty on a universal level, especially in present times due to the COVID-19 pandemic. Therefore, we have amplified examples of simple strategies that educators can implement

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universally with minimal training, in short periods of time (e.g., 1–2 min during a transition), and at little or no cost. In this way, we have matched strategies to the landscape of teacher knowledge and competing demands in schools. These strategies allow educators to prioritize universal SEB needs quickly and efficiently without sacrificing other domains.

Future research is needed to curate and disseminate evidence-based simple strategies that can be easily adapted and incorporated for use in schools. Important questions remain about how such a collection might be presented to promote effective and efficient implementation, how to tailor the strategies for a range of developmental ages and profiles, and whether certain strategies (e.g., breathing techniques) have differential benefits for certain populations or conditions. Finally, research is needed to understand the malleability of children’s affective dispositions. Though some suggest that individuals have a “happiness set point,” or average level of happiness, others have found that adult coping skills are malleable (Rettie and Daniels, 2021), which has interesting implications for research with child populations.

CONCLUSION

In conclusion, child EWB has important implications for success in school and life. We have categorized evidence and curated simple strategies in three broad categories: self-awareness, self-soothing skills, and social relationships. Simple strategies can offer a way for educators to embed these important skills into the school day to promote EWB and child success in their classrooms. Strategies that promote positive coping and increase tolerance for uncertainty are especially critical amid extreme uncertainty resulting from the current COVID-19 pandemic.

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All authors listed have made a substantial, direct and intellectual contribution to the work and approved it for publication.

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An Association Between Montessori Education in Childhood and Adult Wellbeing

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Wellbeing, or how people think and feel about their lives, predicts important life outcomes from happiness to health to longevity. Montessori pedagogy has features that enhance wellbeing contemporaneously and predictively, including self-determination, meaningful activities, and social stability. Here, 1905 adults, ages 18–81 ($M = 36$), filled out a large set of wellbeing scales followed by demographic information including type of school attended each year from 2 to 17. About half the sample had only attended conventional schools and the rest had attended Montessori for between 2 and 16 years ($M = 8$ years). To reduce the variable set, we first developed a measurement model of wellbeing using the survey data with exploratory then confirmatory factor analyses, arriving at four factors: general wellbeing, engagement, social trust, and self-confidence. A structural equation model that accounted for age, gender, race, childhood SES, and years in private school revealed that attending Montessori for at least two childhood years was associated with significantly higher adult wellbeing on all four factors. A second analysis found that the difference in wellbeing between Montessori and conventional schools existed even among the subsample that had exclusively attended private schools. A third analysis found that the more years one attended Montessori, the higher one's wellbeing as an adult. Unmeasured selection effects could explain the results, in which case research should determine what third variable associated with Montessori schooling causes adult wellbeing. Several other limitations to the study are also discussed. Although some of these limitations need to be addressed, coupled with other research, including studies in which children were randomly assigned to Montessori schools, this study suggests that attending Montessori as a child might plausibly cause higher adult wellbeing.

Keywords: wellbeing, human development, education, Montessori, positive psychology

INTRODUCTION

Wellbeing, or the felt experience of health, happiness, and flourishing, predicts several desirable outcomes including better health and work performance, longevity, and more positive social behavior and relations (Ryff, 2014). Low levels of wellbeing predict suicidal behavior even more strongly than does mental illness (Keyes et al., 2012). Even intrinsically, wellbeing could be considered the supreme human outcome (Diener et al., 2015). Although wellbeing is partially determined by genetic inheritance (Røysamb and Nes, 2019), environmental factors are important

contributors (Diener et al., 2016). Yet few childhood experiences have been shown to predict adults' psychological wellbeing. One that does is residential moves: more moves in childhood significantly predicts lower adult wellbeing (Oishi and Schimmack, 2010). Here we explore whether a different childhood experience, Montessori education, might predict higher adult wellbeing. We know of no research examining an association between Montessori specifically and later wellbeing, but one study found that people who had attended various alternative schools including Montessori as children adjusted better to university, controlling for high school baseline (Shankland et al., 2010). Montessori warrants further study, as it is the most common and long-lasting alternative progressive pedagogy in the world (Debs, 2019) and has several features that are endemic to wellbeing-enhancing educational environments (White and Kern, 2018).

A logic model for Montessori education (Culclasure et al., 2019) predicts that Montessori features like choosing one's activities, using real, hands-on materials, and collaborating with peers would result in a range of positive personal and social outcomes. Summaries of child development research and their implications for educational environments also suggest that attending schools with Montessori features (like collaboration and learning based on interests) should enhance wellbeing (National Academies of Sciences Engineering and Medicine, 2018; Darling-Hammond et al., 2019). Actual studies in conventional schools also show that features consistent with Montessori (like low test anxiety: Montessori has no tests) predict higher wellbeing in school (Baker, 2004; Cohen, 2006; Felner et al., 2007; Seligman et al., 2009; Steinmayr et al., 2016, 2018). Furthermore, random lottery studies of Montessori students (discussed later) show differences from waitlisted controls suggesting Montessori lays groundwork that would be expected to lead to higher wellbeing (Lillard and Else-Quest, 2006; Lillard et al., 2017). Here we present a series of structural equation models showing that Montessori schooling in childhood is associated with higher adult wellbeing, after accounting for a range of demographic variables. We begin with discussion of the Montessori system and three features that are known to enhance wellbeing in school and other settings: choice or self-determination, meaningful activities, and social stability.

Montessori Schooling

Initiated in 1907, Montessori pedagogy (Montessori, 1967/1995) is the oldest surviving and most prevalent child-centered, constructivist education system in the world (Debs, 2019), practiced in over 500 public and thousands of private American schools (National Center for Montessori in the Public Sector, 2014) and tens of thousands of schools around the world (180 Studio and Saunders Eckenhoff, 2020). Although some think of it as a preschool model serving mainly White children, Montessori extends through high school, and over half of American public Montessori students today are children of color (Debs, 2019). Three salient Montessori features would be expected, based both on logic and prior research, to lead to certain long term wellbeing outcomes: self-determination, meaningful activity, and stable social relationships (for more discussion of

characteristics of Montessori programs, see Lillard and McHugh, 2019a,b). Although we could not study this directly, we could examine whether there are associations between prior Montessori schooling and adult wellbeing. No study to our knowledge has specifically examined whether attending Montessori is associated with feelings of wellbeing over the long term; school studies tend to look at concurrent or relatively proximate outcomes (Baker, 2004; Cohen, 2006; Felner et al., 2007; Seligman et al., 2009; Steinmayr et al., 2016, 2018), or other long-term outcomes like income (Chetty et al., 2018). Wellbeing in adulthood is a multidetermined outcome, influenced by health, wealth, marital status, and many other features (Diener et al., 2013, 2016), but childhood school experience could plausibly be another predictor. Here we consider how Montessori embodies three features that other research has shown predict wellbeing. **Figure 1** portrays the model we arrived at after conducting the study; below we describe the model we hypothesized prior to analyzing our data.

Self-Determination

Children in Montessori classrooms choose their own work almost all the time, and in this sense are very much in charge of their own educations. A teacher guides children in individual or small group lessons, but children decide which lessons to follow up on, and even whether to sit in on a lesson: they determine their own activities. The classroom is composed of hundreds of potential activities, laid out on shelves, and children choose among them, or even arrange their own field trips during which they leave the classroom to do something else (Montessori, 1967/1995; Lillard, 2017).

Self-determination has been conceptualized as fulfilling a fundamental human need for autonomy (Deci and Ryan, 2011). Choice and its progeny, a sense of control or agency, have been shown to predict stronger intrinsic motivation, self-efficacy, happiness, and sense of competence (Langer and Rodin, 1976; Ryan and Grolnick, 1986; Rovee-Collier and Hayne, 2000; Patall et al., 2008, 2010); living in a more individualistic country, where self-determination is higher, also predicts wellbeing at a national level (Rhoads et al., 2021). Related to self-determination, Montessori has no grades or tests. Research has shown that external rewards and performance evaluations proffer an external sense of control (Ryan and Deci, 2000), and their absence thus allows for an internal locus of control and a sense of self-determination (see Lillard, 2017, Chapter 6). In addition, when given external rewards for doing tasks, people tend to opt for easier tasks (Harter, 1978), avoiding challenge.

We hypothesized that self-determination might lead to two sets of outcomes. A first set concerns what one might call general wellbeing: happiness, finding meaning in life, self-confidence, and (relatedly) a sense of personal competence. A second set of potential outcomes is related to intrinsic motivation: people who experience a high degree of self-determination early in life might later be more intrinsically engaged and seek more challenge. Supporting the idea that self-determination in Montessori schools might cause this array of outcomes, an experience sampling study showed that Montessori middle school students rated themselves more highly

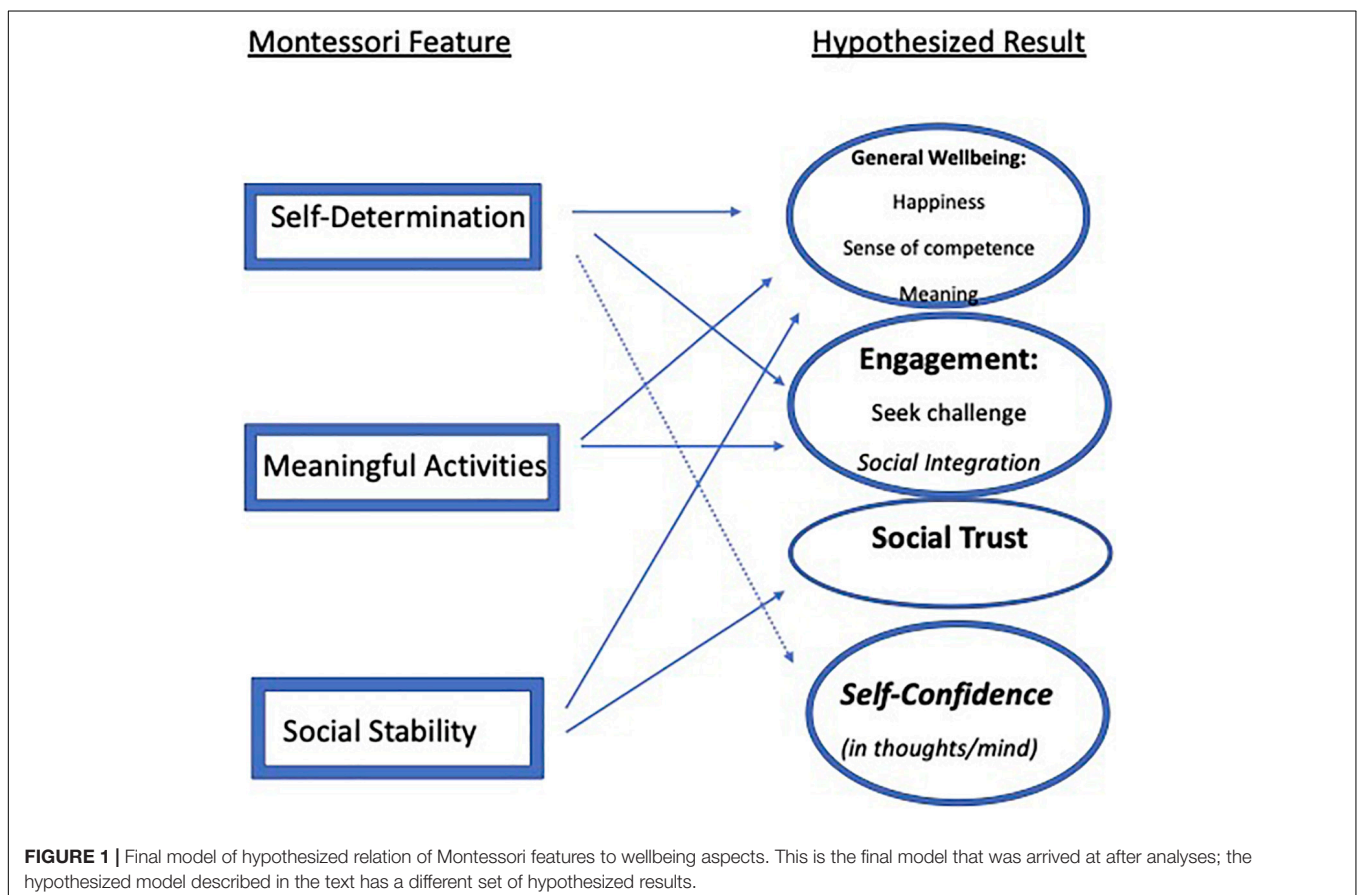
than did conventionally schooled students on positive affect, experiences of “flow” (Csikszentmihalyi, 1997), potency, and intrinsic motivation (Rathunde and Csikszentmihalyi, 2005a). We hypothesized that adults who formerly attended Montessori schools would show higher general wellbeing, including self-confidence, and be more apt to seek challenge and be engaged with their work.

Meaningful Activities

Montessori offers children meaningful activities, by which we mean activities for which the underlying reasons are clear, and thus give people a sense of purpose. Offering meaningful activities is crucial for a school system built on self-determination (Lillard, 2019), because meaning motivates engagement (Bruner, 1990). In prekindergarten, Montessori children learn to prepare, serve, and clean up meals, take care of their classroom, and button their clothes—all meaningful activities for a young child; research shows that children prefer really doing such activities to pretending to do them, because they like having a purpose in their activities (Taggart et al., 2018, 2020). When learning abstract concepts like number, children in Montessori use concrete materials that make obvious what the abstraction is about; this extends for example to using a cube composed of 27 blocks that make clear why the trinomial formula gives the area of a cube: each block represents an element of the formula. If I see that putting together a set of blocks where three blocks

have all sides of length A, B, and C (respectively), 3 correspond to a^2b , and so on, then I can understand why the trinomial formula works; the formula then has meaning—it is not merely an abstraction. In addition, Montessori students can pursue activities that interest them, which of course translates to their activities being personally meaningful.

Work that is geared at an optimal level—challenging but possible—engages people, putting them in the positive state referred to as “flow” (Csikszentmihalyi, 1997). Under free conditions in which a range of meaningful options are supplied, and no rewards (like grades) are offered, people tend to choose engagements at an intermediate level of challenge (Danner and Lonky, 1981; Dweck, 1999; Simon, 2001; Kidd et al., 2012, 2014)—not so easy that they learn nothing, but not so difficult that they will collapse in frustration (and therefore not learn). Given this, the fact that children choose their own work should translate to work being meaningful, which would in theory support higher levels of engagement in Montessori schools. The aforementioned research also suggests this is the case (Rathunde and Csikszentmihalyi, 2005a): Montessori middle school students reported feeling more engaged than other students. Engagement also increases general wellbeing (Lewis et al., 2011), and so by extension meaningful activities might also increase general wellbeing. As shown in **Figure 1**, we hypothesized that the increased engagement that research has shown occurs in Montessori classrooms, perhaps due to one’s



activities being meaningful, translates to increased engagement in activities throughout life. We also expected that a pattern of having meaningful activities in the school years could translate to a general sense of meaning in life and happiness, and thus be related to general wellbeing.

Social Stability and Cohesion

Another Montessori education feature that might enhance long term wellbeing is the social environment, which nourishes social-emotional development and sustained relationships. Classrooms span 3 years (for example, 6- to 9-year-olds, 9- to 12-year-olds, and so on through high school) during which children have the same teacher and immediate peer group; children just older and younger are classmates for 1–2 years, and are met again as one moves up classroom levels.

The practice of staying with the same teacher and classmates, called “looping,” supports positive relationships, self-confidence, and academic performance (Burke, 1996; Little and Dacus, 1999; Cistone and Shneyderman, 2004; Nitecki, 2017; Hill and Jones, 2018); the one study that showed better academic performance but not better relationships (Tourigny et al., 2020) used only 2 years of looping whereas Montessori and some other studies use 3; 3 years (versus 2) might make a difference to relationship quality. Positive academic performance also predicts later wellbeing (Ng et al., 2015; Steinmayr et al., 2016). Being in ungraded multiage classrooms (for example, where “1st grader” is not identified), as Montessori children are, is also particularly beneficial for both academic and social-emotional outcomes, and the benefits increase with more time in such classrooms (Lloyd, 1999).

The Montessori practice of not having grades or tests also might benefit relationships with both teachers and peers. For one, the teacher becomes a guide, rather than one who makes judgments and “grades.” Among students, absence of tests and grades fosters collaboration whereas grades foster competition (Butler and Ruzany, 1993). Collaboration itself is another reason why Montessori schooling might be associated with social aspects of higher adult wellbeing. In Montessori classrooms, particularly at after age 6, students constantly collaborate on schoolwork, which could reasonably be expected to cultivate social skills. As noted, older Montessori students also go on self-arranged small group field trips, and they often create classroom rules themselves (as a group). By middle and high school, Montessori classrooms might go on longer trips together. All these practices could foster greater social cohesion.

We know of no strong studies examining child-teacher relationships in Montessori, but there is evidence (including from lottery-control studies, discussed below) suggesting that peer relationships are stronger in Montessori. This makes sense because, as opposed to conventional schools where students usually work individually, in Montessori schools students often work in small groups. Moreover, research indicates that Montessori student’s social knowledge and skills are more advanced, and the overall school climate is better (Flynn, 1991; Rathunde and Csikszentmihalyi, 2005b; Lillard and Else-Quest, 2006; Lillard et al., 2017; Denervaud et al., 2020a). Random lottery studies also indicate that academic performance is stronger in

Montessori (Lillard and Else-Quest, 2006; Lillard et al., 2017) and well-controlled matched/growth studies (e.g., Culclasure et al., 2018; Denervaud et al., 2019) suggest Montessori leads to higher academic performance. Stronger academic performance has been shown to lead to higher well-being (Ng et al., 2015; Steinmayr et al., 2016), possibly *via* improved self-esteem (Yang et al., 2019), which reinforces more positive relationships and sense of community.

Taken together, findings on social stability led us to predict that Montessori students would have more positive social relationships and a stronger sense of community throughout life (see **Figure 1**). Such factors are typically related to general wellbeing, thus the strong social stability in Montessori schools could also predict higher general wellbeing later.

Summary

In sum, we hypothesized that Montessori pedagogy in childhood might lead to higher wellbeing later in life. The reasoning behind this hypothesis was that the pedagogy has three features (self-determination, meaningful activities, and social cohesion) that other studies have shown enhance wellbeing along several dimensions (clustering into what we might call general wellbeing, intrinsic motivation/engagement, and social skills/social cohesion), and because studies of Montessori versus conventionally schooled children (including natural experiments) have indicated that Montessori students are different along these dimensions during their school years. In the next section we present those natural experiments.

Natural Experiments Suggesting Montessori Might Cause a Trajectory to Higher Wellbeing

Natural experiments using random lotteries have examined the immediate influence of Montessori on proximal child outcomes, and the results for the two studies which involved highly trained Montessori teachers suggest children have higher wellbeing while in school and are on a trajectory toward higher wellbeing later in their lives. These studies controlled for parent characteristics because admission was determined by a random lottery that parents of the control children had also entered. The studies thus have high internal validity, although the results might not apply to families that do not enter such lotteries, lowering external validity. The first study examined children in Kindergarten and 6th grade (Lillard and Else-Quest, 2006), whereas the second followed across preschool (from ages 3 to 6) children who were equal on all measured outcomes at baseline (Lillard et al., 2017). Both contrasted children in high fidelity public Montessori schools (in that both met the standards for recognition by the Association Montessori Internationale or AMI, which meant all the teachers had AMI’s intensive 9-month training and diploma) with waitlist control children in business-as-usual non-Montessori schools. In terms of self-determination and its benefits, the studies showed better academic performance and mastery orientation. In terms of social skills, they showed better social cognition and behavior, and a stronger sense of community. They also indicated more developed executive

function. Academic performance, mastery orientation, social skills, and executive function all predict higher wellbeing (Moffitt et al., 2011; Reynolds et al., 2011, 2017; Sancassiani et al., 2015; Steinmayr et al., 2016, 2018; Haimovitz and Dweck, 2017; Darling-Hammond et al., 2019). Because random assignment designs support causal inference, these lottery control studies suggest attending Montessori might cause higher wellbeing in adults. However, a third natural experiment in France contrasted Montessori children taught by untrained teachers with Ecole Maternale (the highly regarded national preschool program) children; all were randomly assigned at the classroom level (Courtier, 2020). In this study, Montessori children performed unequivocally better on reading, but not on an array of other measures. Further research is needed to determine why these studies had different results; one possibility is that wellbeing-related qualities emerge more reliably when teachers have Montessori training; another is that the Ecole Maternale program has superior outcomes to business-as-usual programs in the United States. Regardless, the U.S. studies lend support to the idea that Montessori causes certain qualities in American children, and other studies show those qualities to be associated with higher wellbeing.

Taking together these findings, as well as the fact that Montessori has conditions that are associated with higher wellbeing, we hypothesized that adults who went to Montessori as children have higher adult wellbeing.

MATERIALS AND METHODS

Participants

Participants were recruited through various methods including Facebook ads in cities known to have many Montessori schools, Amazon's Mechanical Turk, school associations, and snowballing. The final sample consisted of 1905 participants in the US and Canada who had attended Montessori for at least 2 years or who had spent virtually all their school years at conventional schools. Two years of intervention was selected because that duration led to significant outcomes for the Perry Preschool Project (Heckman, 2006), and 2 years of Head Start is significantly more impactful than 1 year (Wen et al., 2012). Although Montessori schooling considers 3 years in a classroom to constitute a full "cycle," whether specific sets of 3 years are associated with later wellbeing was not addressed here. Participants' mean age was 37.05 years ($SD = 13.12$, range = 18–81 years), 79.2% were female, and 83.0% identified as White, 3.4% as Black or African American, 4.5% as Asian, 3.7% as Hispanic or Latino, and less than 1% as American Indian or Alaska Native, Native Hawaiian or Pacific Islander. Another 3.8% aligned with multiple races/ethnicities, and 1% self-identified in other categories (e.g., Jewish) or preferred not to answer. Because of the small sizes of categories other than White, they were grouped for analyses.

The sample size goal was 2000 participants, 1000 in each group (Montessori and conventional), which is well above the threshold needed for an SEM involving 83 paths which is the size of our largest model (Wolf et al., 2013). Our recruiting cut-off was set

at the desired ns or 6 months, whichever came earlier. Based on Wolf et al.'s (2013) analysis, and given our model structure, parameters, and variables, our final sample size of 1905 should have sufficient power to detect the hypothesized effects.

Participants were partitioned into groups using R. Those who had spent no or only 1 year in an unconventional school (like Montessori) were categorized as conventional, $n = 1071$ (19 had gone to Montessori for just 1 year). Those with at least 2 years of Montessori, $n = 834$, were classified as such. Although a 2-year cutoff was used, for the Montessori group the average length of attendance was 8 years ($SD = 3.66$, range 2–16). An additional group of participants who had attended other alternative schools for two or more years ($n = 506$) were excluded from analyses to focus here on Montessori versus conventional schooling. (Their results will be reported elsewhere).

Procedure

Surveys were administered on the Qualtrics platform with a compensation rate of \$0.50/survey. Participants who gave informed consent were then given a series of scales and questions, ending with demographic questions including school types attended. The stated purpose of the research in the informed consent was "to better understand the long-term outcomes of alternative and conventional school education on peoples' lives." On the final page, school type history was requested; no specific school system was mentioned until after all other measures had been filled out.

Survey

The survey included 18 established scales (see below) that were intended to get at a variety of aspects of wellbeing, and a few ordinal scales and other questions getting at issues of interest. Because the ordinal scales explained little variance in wellbeing, they were not used in our analyses, but those results were consistent with the ones below and will be reported elsewhere. Eleven of our 18 scales are subscales of the Psychological and Social Wellbeing scales (SWB). Below, after considering advantages and disadvantages of online surveys, we describe each scale with its original alpha; in the present study, alphas were the same or exceeded the originals in all cases except one (Social Coherence, for which our $\alpha = 0.54$ vs. 0.64 in the original).

Online Survey Delivery

Online surveys are an important source of data for psychology research, with pros and cons (Gosling and Mason, 2015). One benefit is the ability to recruit large samples from the general population (versus, for example, undergraduate psychology majors) including samples with relatively rare characteristics of interest. This made them ideal for this study, since Montessori schools are much less common than conventional schools. Other benefits are reducing self-presentation bias and experimenter influence. There are also disadvantages. For example, drop-out rates in online survey research are high, averaging 34% in a meta-analysis that saw ranges from 0 to 87% (Musch and Reips, 2000). Drop-out can be a serious concern when it occurs more in one assigned condition than another, but this does not apply here because conditions were not assigned in this study.

Also mitigating this concern, studies have shown that samples completing internet surveys closely resemble the populations from which they are drawn (Gosling and Mason, 2015). Another potential problem is multiple submissions; we guarded against this by ensuring each respondent had a unique computer identifier (IP address). Another issue is that respondents are limited to people who use the internet, and findings might not generalize to the population. As internet usage increases, this is less of a concern—87% of households in the developed world were on the internet in 2018 and these data were collected in 2019 (ITU Publications, 2019). However, it is the case that survey respondents (be they on a telephone or online) tend to be younger, female, White, and affluent (Curtin et al., 2000; Singer et al., 2000; Smith, 2008). We accounted for these factors in our models, but it is a limitation of the online survey method and therefore of this study.

There are many measures of wellbeing (Ackerman et al., 2018), tapping into outcomes ranging from finding meaning in one's life to mindful awareness to one's sense of community support. Our approach was to use a wide range of accepted measures of adult wellbeing, and reduce the measures to a manageable set using exploratory and confirmatory factor analyses, and then examine how the resulting factors align with the three hypothesized outcome clusters. Finally, we conducted a series of Structural Equation Modeling (SEM) analyses to examine whether Montessori was a meaningful predictor of outcomes after accounting for demographic variables.

Psychological Wellbeing Scales (PWB)

Participants filled out six PWB scales (Ryff and Keyes, 1995) of three items each. Participants rated each item using a 7-point scale ranging from *strongly agree* to *strongly disagree*. The six PWB scales, with their original reported alphas, are Self-Acceptance (e.g., “When I look at the story of my life, I am pleased with how things have turned out so far”; $\alpha = 0.59$), Environmental Mastery (“I am good at managing the responsibilities of daily life”; $\alpha = 0.52$), and Autonomy (“I judge myself by what I think is important”; $\alpha = 0.48$), all of which seem to tap into General Wellbeing (see **Figure 1**); Personal Growth (“Life is a continuous process of growth”; $\alpha = 0.55$) and Purpose in Life (“Some people wander aimlessly through life; I am not one of them”; $\alpha = 0.36$), which seem to tap Engagement; and Positive Relations (“People would describe me as a giving person”; $\alpha = 0.58$), which seems to tap Social Trust. Higher scores indicate greater levels of wellbeing.

Social Wellbeing Scales

The five SWB Scales (Keyes, 1998) each have three items that use the same 7-point scale as the PWB scales. The SWB scales are Social Coherence (“I can predict/make sense of the world”; $\alpha = 0.64$) and Social Contribution (“I have something to give”; $\alpha = 0.66$) which tap into the self-confidence aspect of General Wellbeing and perhaps the meaning aspect of Engagement; and Social Integration (“I feel close to people in my community”; $\alpha = 0.73$), Social Acceptance (“People are kind”; $\alpha = 0.41$), and Social Actualization (“Society is getting better”; $\alpha = 0.64$) which all appear to tap into Social Trust.

Satisfaction With Life Scale

The Satisfaction with Life Scale (SWL) (Diener et al., 1985), one of the most commonly used measures of wellbeing (Ackerman et al., 2018), consists of five items (e.g., “In most ways my life is close to my ideal”; $\alpha = 0.87$) which participants rate using the same 7-point scale ranging from *strongly disagree* to *strongly agree*. Ratings for each of the five items are summed up to calculate a single aggregate score. A high score indicates high satisfaction with one's own life, and seems to tap into one's general sense of wellbeing and happiness.

Meaning in Life Questionnaire

This 10-item scale (Steger et al., 2008) measures meaning in life, including its presence and one's search for meaning; in the current study we used the 5-item MILQ-Presence subscale to assess the presence of meaning in life. Using a 7-point scale ranging from *absolutely untrue* to *absolutely true*, participants rate five short statements such as, “My life has a clear sense of purpose”; $\alpha = 0.86$. An aggregate score is calculated by summing up the five items, and a higher score reflects a higher subjective sense of meaning in one's life. This scale appears to tap into the meaning aspect of engagement.

Subjective Vitality Scale

This 7-item scale (Ryan and Frederick, 1997) measures the extent to which one feels alive and alert. Using a 7-point scale ranging from *not at all true* to *very true*, participants rate seven short statements such as, “I feel alive and vital”; $\alpha = 0.83$. An aggregate score is calculated by adding ratings from each of the items. As is recommended, the second item (the only one needing to be reverse scored) was dropped (Bostic et al., 2000). This scale also seems to tap general wellbeing and happiness.

Short Need for Cognition Scale

This 18-item scale (Cacioppo et al., 1984) measures the extent to which individuals engage in and enjoy effortful thinking. Using a 5-point scale ranging from *extremely uncharacteristic of me* to *extremely characteristic of me*, participants rate statements such as, “I really enjoy a task that involves coming up with new solutions and problems”; $\alpha = 0.90$. An aggregate score is calculated by adding ratings from the 18 items, with higher scores indicating high interest in thinking, complex problem solving, and intellectual tasks. We expected that having the opportunity to choose difficult and meaningful activities as a child might lead to a lifelong desire to seek challenges, creating Engagement.

Mindful Attention Awareness Scale

This 15-item scale (Brown and Ryan, 2003) measures individuals' dispositional mindfulness, or awareness and attention to the present moment. Using a 6-point scale ranging from *almost always* to *almost never*, participants rate each statement with reference to their day-to-day experiences. For example, one item is, “I find it difficult to stay focused on what is happening in the present;” a high score means that is almost never true; $\alpha = 0.81$. An aggregate score is calculated by averaging the 15 responses. Higher scores reflect higher dispositional mindfulness, which is thought to be generally related to wellbeing.

As noted we also administered some ordinal scales and a few isolated questions; in addition we administered the Big 5 personality survey (Brody and Ehrlichman, 1998). Because whether personality should be viewed as a wellbeing *outcome* is controversial, we do not discuss this further here, nor do we discuss the ordinal scales which did not contribute to the variance in our models.

Demographics and School History

After completing the wellbeing measures, participants answered standard demographic questions, reporting factors such as their age, gender, and race. In addition, they were asked how they would describe their family's social class when they were 3–12 years old, with five options: lower/working, lower middle, middle, upper middle, and upper. Similar scales have been successfully used in other studies to measure adults' estimates of their childhood SES (Straughen et al., 2013; Listl et al., 2018; Lindberg et al., 2021). Childhood SES is highly related to child outcomes (Reardon, 2011; Duncan and Murnane, 2014), and a meta-analysis showed that one's own estimate of one's SES (often called SSS, for subjective social status) is more strongly related to wellbeing than is one's actual SES (Tang et al., 2016).

Finally, participants were asked, for each year from ages 2 to 17, what type of school they attended, with options including Regular/Traditional, Montessori, Homeschool, Waldorf, Reggio Emilia, Other Alternative, and did not attend. They were also asked how the school they went to each year was funded, with options of Public, Private (non-religious), and Private (religious), and did not attend. The format of this page was as follows: the ages ("2 years old," and so on) were listed down the left-most column, the next seven columns held circles one could check for the type of school, and the next four columns were for the funding model.

Analytic Approach

There was no missing data. An exploratory factor analysis (EFA) was done on a randomly selected two-thirds of respondents' data using all variables and maximum likelihood extraction. A four-factor structure was confirmed in a confirmatory factor analysis (CFA) done with the remaining data. These factors were then entered in a series of Structural Equation Models (SEM) that accounted for age, race, childhood SES, gender, and proportion of years attending private schools. All analyses were run using R, OpenMx 2.19.1 (Neale et al., 2016), and SPSS 24.

Model Fit

The purpose of using factor analysis here was to reduce the variable set; the variables were selected because they are frequently used to measure wellbeing, rather than with an eye to expected factors. Adequacy of model fit was determined according to the guidelines set by Plucker (2003) for factor analyses (RMSEA.05-0.10; AGFI 90+, CFI.90+) and using a multi-index approach as suggested by Hu and Bentler (1999). For this we added the Tucker-Lewis Index (TLI), adopting the common standard for of 0.90. RMSEA was the favored index because of the relatively large sample size and number of indicators, which can lower the values of CFI and TLI indices

(Kenny and McCoach, 2003; Shi et al., 2019). Chi-square was inappropriate here because of the relatively large sample size (Hu and Bentler, 1999; Russell, 2002).

Data Preparation

Several scales, particularly the PWB scales, resulted in data that were on visual inspection negatively skewed, reflecting that as a whole, the sample had high wellbeing. Box-Cox transformations were applied to skewed variables (Box and Cox, 1964). We rounded lambdas to the nearest whole number to decide whether to square or cube the variable. Box-Cox transformations were then applied to check that the new rounded lambda value was close to 1; the one exception to this was Personal Growth, which would need to be raised to the 6th power by this criterion; after cubing had a lambda of 2.07 and was not transformed further. As stated, there were no missing data.

RESULTS

Table 1A shows the raw unadjusted means, SDs, scale alphas in this study, and the correlations among the scales, age, and Montessori status; **Table 1B** shows the means and SDs or percentages on each demographic variable for the Montessori and conventional samples separately, and **Table 1C** shows the same for the scales. The vast majority (80%) of participants filled out the surveys in under 30 min; 16 min was the modal time to completion. First we report results from the EFA, then the CFA. We then discuss the resulting factors before turning to the SEM.

Factor Analyses

Exploratory factor analysis using maximum likelihood extraction was run with the correlation matrix from data of approximately 2/3 of the participants ($n = 1220$). This n allowed covariates (such as gender and childhood SES) to be balanced across conditions (Montessori and conventional). A Promax oblique rotation was used, allowing all factors to intercorrelate. Initially the training set was run using 1–11 factors and all variables. The ordinal items (classified as "Other Questions" in the survey) explained little variance (low communality or h^2 values), which made sense in that they were designed to get at issues a step removed from wellbeing. The ordinal variables were removed, and a new set of EFAs were run using the same methods.

A parallel analysis approach (Horn, 1965) was taken to determining the number of factors. This approach is favored over the Kaiser criterion of eigenvalue > 1 , which has been described as "not psychometrically justifiable" (Reise et al., 2000, p. 291) and is prone to over and under extraction of factors (Reise et al., 2000; Russell, 2002). With parallel analysis, random data sets are generated constituting the same number of items and participants; the scree plot from these data is laid over the scree plot from the actual study data, and where the actual and simulated data lines cross indicates the *maximum* number of factors (see **Figure 2**); fit statistics are also taken into consideration (see **Table 2**). Examination of the scree plot suggested a maximum of five factors, which explained 54% of the variance. However, a four-factor solution had an adequate fit

TABLE 1A | Means, SDs, and correlation matrix for observed continuous variables: entire sample.

Observed variable	Mean	SD	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Age	37.05	13.11		1.0																	
2. Yes/no Montessori	-0.12	0.99		-.34	1.0																
3. Life satisfaction	24.95	7.10	0.90	0.03	0.16	1.0															
4. Self acceptance	16.82	3.90	0.75	0.05	0.18	0.75	1.0														
5. Meaning in life	26.64	6.55	0.91	0.19	0.02	0.59	0.60	1.0													
6. Environ. mastery	15.57	3.86	0.69	0.12	0.17	0.62	0.66	0.48	1.0												
7. Subjective vitality	4.71	1.26	0.90	0.10	0.13	0.60	0.59	0.55	0.59	1.0											
8. Autonomy	16.87	3.16	0.56	0.24	-0.03	0.20	0.30	0.27	0.33	0.20	1.0										
9. Mindful awareness	4.08	0.79	0.87	0.24	0.05	0.31	0.39	0.36	0.46	0.41	0.34	1.0									
10. Social coherence	13.57	3.77	0.54	0.03	0.14	0.30	0.35	0.29	0.40	0.31	0.30	0.29	1.0								
11. Personal growth	19.05	2.59	0.67	-0.08	0.23	0.39	0.48	0.42	0.44	0.45	0.23	0.25	0.24	1.0							
12. Purpose in life	17.05	3.24	0.42	-0.04	0.15	0.43	0.51	0.46	0.41	0.36	0.22	0.27	0.27	0.51	1.0						
13. Positive relations	17.01	3.80	0.65	0.07	0.20	0.51	0.57	0.46	0.48	0.46	0.22	0.35	0.27	0.43	0.41	1.0					
14. Social integration	16.48	4.49	0.87	0.03	0.25	0.50	0.54	0.45	0.45	0.47	0.13	0.25	0.24	0.45	0.38	0.59	1.0				
15. Social actualization	13.35	4.24	0.71	-0.13	0.24	0.38	0.38	0.25	0.32	0.36	0.05	0.18	0.35	0.32	0.26	0.32	0.38	1.0			
16. Social acceptance	14.23	3.55	0.51	0.04	0.22	0.37	0.36	0.27	0.33	0.32	0.12	0.19	0.23	0.33	0.22	0.39	0.45	0.51	1.0		
17. Social contribution	18.02	3.38	0.76	0.11	0.19	0.48	0.59	0.57	0.48	0.48	0.28	0.29	0.34	0.55	0.49	0.47	0.57	0.35	0.39	1.0	
18. Short need cognit.	69.14	12.03	0.90	0.03	0.12	0.26	0.28	0.26	0.27	0.31	0.30	0.20	0.32	0.43	0.32	0.22	0.24	0.20	0.21	0.40	1.0

by the preferred measure (RMSEA of 0.079) and explained 50% of the variance; it was selected because the five-factor solution had ultra-Heywood cases (Dillon et al., 1987). All factor loadings for the four-factor solution are shown in **Table 3**. The cut-off value for a variable's loading on a factor was set to >0.35 because this resulted in the best-fitting model and minimized the number of crossloadings.

Factor 3 has only two indicators; three or more can improve stability (Thurstone, 1947), but this recommendation is more flexible for SEM models, and Kenny (2012) advises that a two-indicator factor is acceptable if the errors are uncorrelated and their loadings are set to equal each other. Therefore, in the CFA, the loadings of the two indicators were set to equal each other, and these conditions were met.

The factor correlations and variance accounted for are shown in **Table 4**. General wellbeing accounted for the largest proportion of variance (38%), and was strongly correlated with all three other factors, as might be expected of General Wellbeing. Engagement accounted for 30% of the variance, and was also strongly related to Social Trust and Self-confidence (r s of 0.52 and 0.48, respectively). Social Trust and Self confidence each accounted for 16% of the variance; their relation to each other was 0.28.

Next a confirmatory factor analysis using maximum likelihood estimation was conducted on the remaining 36% of respondents' data; the results are in **Table 5** and fit indices are in **Table 2**. **Figure 3** shows the resulting model. As one might expect from the high correlations, there were mostly very high loadings; the four factors and the item loadings are discussed next.

The Four Factors

The purpose of the factor analyses was to reduce the set of scales to a smaller number of factors and to suggest latent variables emerging from a set of wellbeing measures administered to all

participants. Based on prior research concerning the outcomes or at least associates of self-determination, meaningful activities, and social stability (which can exist to varying degrees in any school experience), we hypothesized three latent clusters would emerge: one concerning happiness, meaning, and self-confidence; one concerning engagement and seeking challenge; and a third concerning social trust and sense of community. The factor analysis actually resulted in four factors that align reasonably well with what was hypothesized, with the first cluster of outcomes splitting into two (self-confidence and general wellbeing; see **Figure 1**). Again, the present study is not directly testing the paths shown in the figure; it only tests their plausibility.

General Wellbeing

The first factor is "General Wellbeing," with six indicators (see **Table 5**). Self Acceptance from the Psychological Wellbeing Scale was set to 1.0, and one other Psychological Wellbeing scale, Environmental Mastery (e.g., "In general, I feel I am in charge of the situation in which I live"), also loaded highly on this factor (0.90). Meaning in Life ("My life has a clear sense of purpose") and Satisfaction with Life ("In most ways, my life is close to ideal") loaded highly on this factor as well, as did Subjective Vitality ("I have energy and spirit"). Mindful Attention Awareness ("I rush through activities without being really attentive to them" [item is reverse scored]) had the lowest loading at 0.62. Cronbach's alpha for these six items on the CFA test data set was 0.88 (95% confidence interval 0.87–0.89). Dropping any item except Mindful Attention Awareness resulted in a lower alpha; dropping that item slightly increased alpha to 0.89, but this was within the confidence interval, and dropping it from the model resulted in Heywood cases, so it was retained.

We had hypothesized that three Montessori features—self-determination, meaningful activities, and social stability—would lead to happiness, a sense of meaning, and self-confidence.

TABLE 1B | Means, SDs, and/or percentages for demographic variables for the Montessori and conventional samples.

	Montessori	Conventional
Mean Age (SD)	31.95 (9.6)	41.0 (14.1)
Gender	Male	19.0
	Female	81.0
Race/Ethnicity	White	82.4
	Black or African American	4.6
	American Indian or Alaska Native	0.7
	Hispanic or Latino	3.7
	Asian	4.9
	Native Hawaiian or Pacific Islander	0.0
	Multiple	2.6
	Other	1.0
Preferred not to answer	0.2	0.1
<i>Maternal education</i>		
Less than high school diploma	1.4	7.0
High school diploma	5.0	24.0
Some college or vocational training	9.1	16.1
2-year college degree	4.4	9.1
4-year college degree	35.1	26.5
Post-college degree	44.8	17.4
<i>Social class during childhood</i>		
Lower/working	5.2	16.5
Lower middle	10.8	19.4
Middle	40.2	38.6
Upper middle	38.8	22.7
Upper	5.0	2.8
Proportion private schooling	0.67	0.37
Years in Montessori	8.03 (3.7)	0.02 (0.13)
Years in conventional	7.22 (3.8)	14.0 (1.34)

Standard deviations (SDs) are in italics.

These predictions were upheld, in that the Satisfaction with Life scale, Subjective Vitality, and Self Acceptance all reflect happiness, Meaning in Life is eponymous, and Environmental Mastery reflects self-confidence. However, three other variables that reflect self-confidence in a somewhat different sense loaded instead on a discrete factor we called Self-Confidence (discussed below); in the EFA Environmental Mastery also loaded on that factor (0.23) but not at a level that met the threshold of 0.35.

Engagement

The second factor reflects investing oneself in one’s activities and social world. Social Contribution (“My daily activities contribute to something worthwhile to my community”) was set to 1.0 and Social Integration (“I feel close to other people in my community”) had a loading of 0.91; both these scales are from the Social Wellbeing scale. Also loading on Engagement were Personal Growth (e.g., “Life is a continuous process of learning,” 0.88), Positive Relations (“People would describe me as a giving person, willing to share my time with others,” 0.93), and Purpose in Life (“Some people wander aimlessly through life, but I am not one of them,” 0.82), all Psychological Wellbeing scales. Cronbach’s alpha for these five items was 0.83 (95% confidence interval 0.81–0.85). Dropping any item resulted in a lower alpha. This factor

TABLE 1C | Untransformed means and standard errors for Montessori and conventional samples.

	Montessori		Conventional	
	M	(SE)	M	(SE)
Psychological wellbeing				
<i>Personal growth</i>	19.73	(0.07)	18.52	(0.09)
<i>Environmental mastery</i>	16.31	(0.12)	14.99	(0.12)
<i>Purpose in life</i>	17.61	(0.10)	16.62	(0.10)
<i>Positive relations</i>	17.87	(0.12)	16.35	(0.12)
<i>Self-acceptance</i>	17.60	(0.12)	16.22	(0.13)
<i>Autonomy</i>	16.76	(0.11)	16.96	(0.10)
Social wellbeing				
<i>Social coherence</i>	14.18	(0.12)	13.09	(0.12)
<i>Social integration</i>	17.76	(0.12)	15.49	(0.15)
<i>Social acceptance</i>	15.12	(0.11)	13.54	(0.11)
<i>Social contribution</i>	18.73	(0.09)	17.47	(0.11)
<i>Social actualization</i>	14.50	(0.13)	12.44	(0.13)
<i>Satisfaction with life</i>	26.21	(0.22)	23.98	(0.23)
<i>Meaning in life</i>	26.78	(0.21)	26.53	(0.21)
<i>Subjective vitality</i>	4.90	(0.04)	4.57	(0.04)
<i>Mindful attention</i>	4.13	(0.03)	4.05	(0.03)
<i>Need for cognition</i>	70.75	(0.37)	67.90	(0.40)

Scales used in factor analyses and standard errors are in italics.

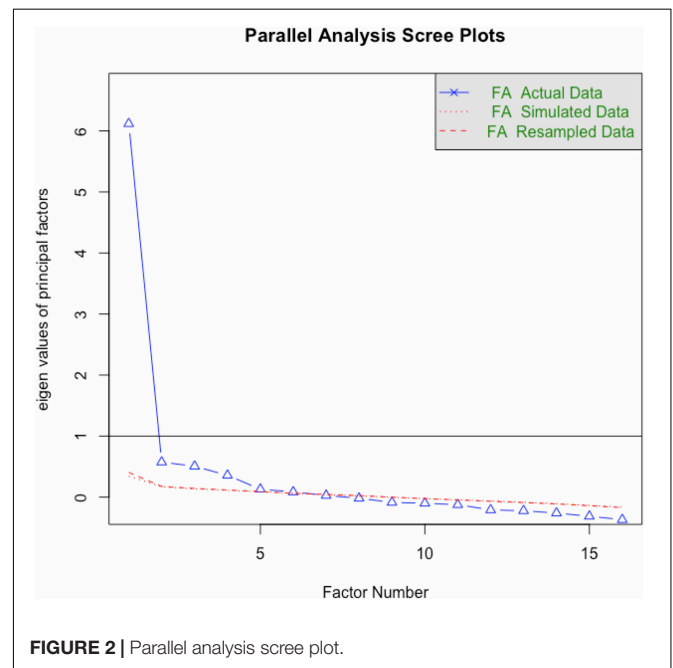


FIGURE 2 | Parallel analysis scree plot.

resembled the second cluster of outcomes we hypothesized would result from the Montessori characteristics of self-determination and meaningful activities, with a stronger social engagement element than was anticipated.

Social Trust

The third factor included two Social Wellbeing subscales, Social Acceptance and Social Actualization, which reflect trust in

TABLE 2 | Goodness of fit measures and variance explained for analyses 1, 2, and 3.

	% Variance explained	RMSEA [CI]*	AGFI	CFI	TLI
Analysis 1: full sample					
EFA-4 factors	50	0.079 [0.073–0.085]			0.884
EFA-5 factors	54	0.069 [0.062–0.076]			0.914
CFA		0.081 [0.073–0.088]	0.999	0.91	0.894
SEM with predictors		0.093 [0.090–0.096]		0.75	0.694
Analysis 2: private SEM		0.093 [0.086–0.099]		0.75	0.70
Analysis 3: Montessori duration SEM		0.090 [0.085–0.094]		0.73	0.67

*90% Confidence Interval for EFA; 95% for CFA and SEM.

TABLE 3 | Promax rotated factor loadings: EFA 4-factor solution.

Factors	Item	Factor loading				h ²
		1	2	3	4	
Factor 1: “General Wellbeing”						
	Satisfaction with life	0.85	0.01	–0.07	–0.15	0.68
	PWB_Self acceptance	0.71	0.16	0.03	0.01	0.72
	PWB_Environmental mastery	0.63	–0.04	0.05	0.23	0.61
	Subjective vitality	0.51	0.17	0.06	0.08	0.51
	Meaning in life	0.47	0.33	–0.14	0.04	0.47
	Mindful attention awareness	0.38	–0.07	–0.05	0.32	0.30
Factor 2: engagement						
	SWB_Social contribution	0.03	0.65	0.03	0.14	0.58
	PWB_Personal growth	–0.05	0.60	0.03	0.21	0.49
	SWB_Social integration	0.20	0.59	0.14	–0.20	0.55
	PWB_Purpose in life	0.12	0.49	–0.07	0.13	0.38
	PWB_Positive relations	0.35	0.43	0.02	–0.10	0.44
Factor 3: social trust						
	SWB_Social actualization	0.02	–0.05	0.83	0.02	0.68
	SWB_Social acceptance	0.02	0.24	0.50	–0.07	0.41
Factor 4: self-confidence						
	PWB_Autonomy	–0.08	0.03	–0.15	0.55	0.34
	Need for cognition	–0.23	0.30	0.05	0.52	0.37
	SWB_Social coherence	0.10	–0.12	–0.30	0.47	0.38

The extraction method was maximum likelihood with an oblique (Promax with Kaiser normalization) rotation. Factor loadings above 0.35 are in bold.

society—items like, “The world is becoming a better place for everyone” and “I believe that people are kind.” Because there were two items for this factor, their loadings were set to be equal (see

TABLE 4 | EFA: factor correlations and proportion of variance accounted for.

	Proportion of variance	General wellbeing	Engagement	Social trust
General wellbeing	0.38	1.0		
Engagement	0.30	0.66	1.0	
Social trust	0.16	0.47	0.52	1.0
Self-confidence	0.16	0.53	0.48	0.28

TABLE 5 | CFA loadings and standard errors (SE).

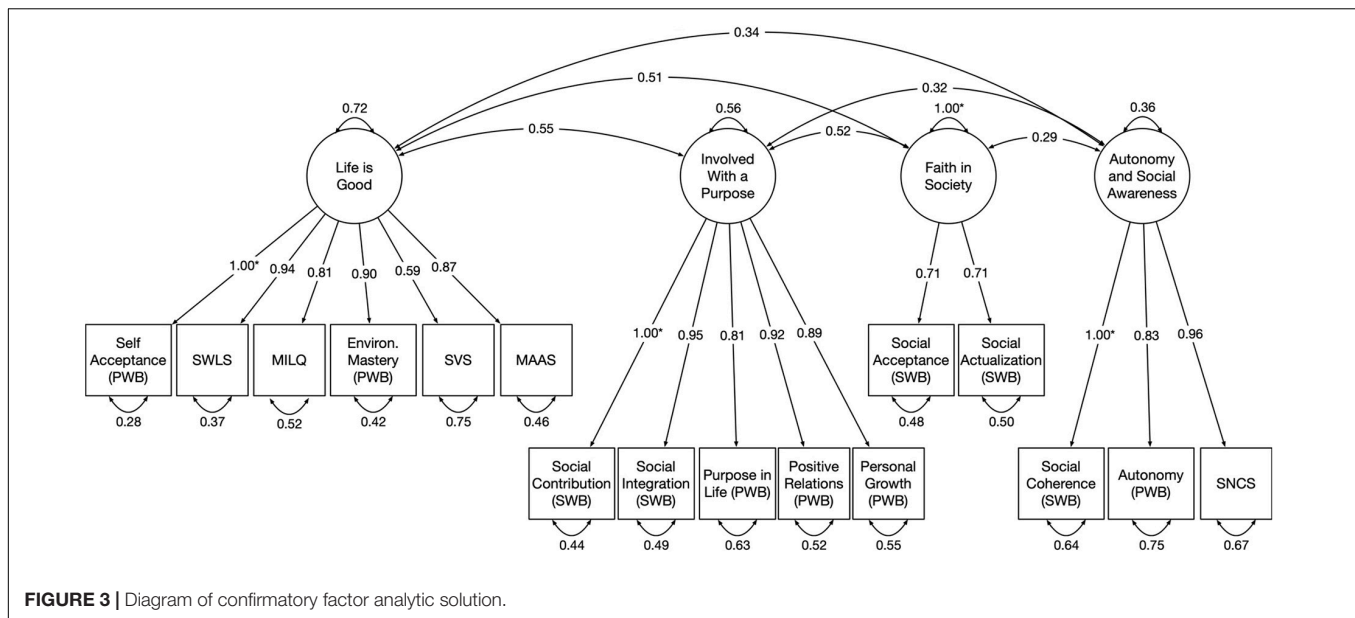
Factor	Item	Estimate				SE
		1	2	3	4	
Factor 1: general wellbeing	PWB_Self acceptance	1.00				
	Satisfaction with life	0.97				0.04
	Meaning in life	0.86				0.04
	PWB_Environmental mastery	0.90				0.04
	Subjective vitality	0.88				0.04
	Mindful attention awareness	0.62				0.05
Factor 2: engagement	SWB_Social contribution		1.00			
	PWB_Personal growth		0.88			0.05
	SWB_Social integration		0.91			0.05
	PWB_Purpose in life		0.82			0.05
	PWB_Positive relations		0.93			0.05
Factor 3: Social Trust	SWB_Social acceptance			0.71		0.03
	SWB_Social actualization			0.71		0.03
Factor 4: Self-Confidence	SWB_Social coherence				1.00	
	PWB_Autonomy				0.86	0.09
	Need for cognition				0.99	0.10

Factor loadings are in bold.

above) at 0.71. Cronbach’s alpha for these two items was 0.67 (95% confidence interval 0.63–0.72). This factor reflects outcomes prior research suggested would result from Montessori’s high degree of social stability.

Self-Confidence

Loading on the fourth factor were three variables that reflect confidence in one’s own thinking (as opposed to one’s behaviors, which the Environmental Mastery subscale taps more). Social Coherence from the Social Wellbeing scale, including items like “I find it easy to predict what will happen next” was set to 1.0, and the Need for Cognition scale loaded highly with it (0.99); this scale includes items like, “I like to have the responsibility of handling a situation that requires a lot of thinking” and “I prefer my life to be full of puzzles that I must solve.” Autonomy from the Psychological Wellbeing scale also loaded on this factor (0.86), with items like, “I have confidence in my own opinions” and “I



judge myself by what I think is important, not what others think is important.” Cronbach’s alpha for these three items was 0.57 (95% confidence interval 0.52–0.63). Dropping any item resulted in a lower alpha.

In sum, two of the three outcome clusters we had hypothesized, based on prior research, would stem from experiences involving high levels of self-determination, meaningful activities, and social stability were upheld, with Engagement having a social aspect that was not expected. The first hypothesized factor, however, split into two, with outcomes pertinent to general wellbeing (including confidence in one’s abilities) falling into one cluster and outcomes more specifically related to self-confidence about one’s thought processes in a fourth cluster.

Predicting the Structural Model From Montessori Attendance

Having reduced the wellbeing scales to a set of four latent factors, the next step was to examine whether experience with Montessori schooling is associated with participants’ scores on any of those four factors, for the whole sample of 1905 participants, divided into the Montessori and Conventional school groups as explained above. Gender (Male/Female), race (Caucasian/Not), age, childhood SES (lower/working, lower middle, middle, upper middle, upper), and proportion of schooling that was private were accounted for as covariates in the models. There was a significant improvement in model fit when the binary variable of schooling (Montessori for at least 2 years, or Conventional) was added into the model, both overall and ranging across all four factors. Social trust had the largest beta-value (0.32) but even the lowest beta-value, for Self-confidence, showed a highly significant effect of Montessori ($p < 0.001$).

This indicates that the means on all four factors are significantly higher for the Montessori group, after accounting for the covariates. The means, SDs, standardized regression

coefficients, and corrected p -values are shown in **Table 6**, and the covariate values are shown in the **Supplementary Table**.

Summary

Montessori attendance significantly predicted higher scores on all four latent variables: General Wellbeing, Engagement, Social Trust, and Self-confidence. This makes theoretical sense, in that Montessori schools have features that are related to these aspects of wellbeing. For example, Montessori gives children free choice and thus a high degree of self-determination, which (as reviewed in the section “Introduction”) has been shown in other research to render happiness and a strong sense of one’s own competence, and which allows one to find and engage in activities that give one a sense of purpose. The second feature we highlighted is that Montessori activities are meaningful, in that they have a clear purpose to which children can relate; this, along with self-determination, allows one to choose work that provides an optimal level of challenge, creating strong engagement. We did not anticipate that higher engagement among people who attended Montessori would include social integration, but it clustered with other variables tapping into engagement in the factor analysis. The third Montessori feature, social stability (including multi-year classrooms), was hypothesized to lead to strong relationships which then predict higher general wellbeing as well as social trust. Classroom looping practices also improve academic performance, which in turn predicts higher wellbeing. Thus, the results are consistent with what we hypothesized, based on prior research.

However, an alternative possible explanation for these results is that they stem not from at least 2 (and in this sample, an average of 8) years of Montessori education or some associate thereof, but instead from a third variable, perhaps something associated with having parents who make the effort to select and in most cases finance a specific school for their child, as opposed to using the default neighborhood public option. In

TABLE 6 | Means and SDs, standardized regression coefficients, and p -values for SEM.

	Mean (SD) Montessori	Mean (SD) conventional	β	p -value
General wellbeing	0.167 (0.83)	-0.130 (0.92)	0.17	<0.001
Engagement	0.025 (0.07)	0.019 (0.09)	0.21	<0.001
Social trust	0.370 (1.10)	-0.287 (1.23)	0.32	<0.001
Self-confidence	0.101 (0.75)	-0.078 (0.80)	0.10	<0.001

TABLE 7 | Analysis 2, private-only sample: means, SDs, standardized regression coefficients and p -values for SEM.

	Mean (SD) Montessori	Mean (SD) conventional	β	p -value
General wellbeing	0.228 (0.77)	-0.071 (0.95)	0.17	<0.001
Engagement	0.032 (0.07)	-0.046 (0.09)	0.20	<0.001
Social trust	0.464 (1.06)	-0.184 (1.09)	0.37	<0.001
Self-confidence	0.105 (0.72)	-0.034 (0.77)	0.07	0.07

other words, it may be that having parents who go out of their way to find and fund a different school program leads to higher adult wellbeing, or is associated with other factors that lead to higher wellbeing. Of course, many public school parents also are very intentional about their choice, choosing their domicile (and paying property taxes) based on public school district, but nonetheless they do not pay tuition in addition to taxes. Although we had covaried years of private school in the initial analysis, a more focused way to examine whether something associated with parents choosing a private school explains the results is to limit the dataset to participants who always attended a private school, because private schools are never the default option; every child in the United States and Canada lives in a school district where they could attend a tuition-free public school at least from Kindergarten on. A second analysis therefore analyzed data from the subset of participants who attended private schools for all of their schooling.

Robustness Check/Alternative Specification #1

The second analysis involved the subsample of 439 participants who had exclusively attended private schools: a Montessori group of $n = 268$ for whom at least 2 of those years were in private Montessori (with all or most of the remaining years in conventional private school programs), and Conventional group of $n = 171$ who went exclusively to conventional private schools. The Montessori group had spent $M = 9.22$ years ($SD = 3.59$) in Montessori schools and $M = 6.14$ ($SD = 3.71$) in conventional private schools, whereas the exclusively private conventional group had spent $M = 14.53$ years ($SD = 1.30$) in school, virtually all of it in conventional private schools. The mean age of participants was 33.99 years ($SD = 11.55$, range = 18–71), 93 were male (21.2%), and the rest were female; 87.9% identified as White.

The structural equation model of the initial analysis was conducted using only data from the exclusively privately schooled subset of participants. These results, including mean factor scores

and SDs, are shown in **Table 7**; model fit statistics are in **Table 2**. Even among the exclusively privately schooled subset—those participants whose parents selected and typically paid tuition at a private school for their entire precollege life, and even after accounting for the effects of age, gender, race, and childhood SES, having attended Montessori for at least 2 years (and an average of 9 years) was significantly associated with higher wellbeing on three of the four factors: General Wellbeing, Engagement, and Social Trust. Self-confidence was not significant ($p = 0.07$), suggesting that confidence in one's own thinking/mind is as strong among those who attended private conventional schools as among those who attended private Montessori schools.

The standardized Beta values in the SEM were similar to what they were for the whole sample, but slightly stronger for Social Trust and slightly less strong for Self-confidence. Thus, while the initial analysis controlled for the proportion of schooling that was private, this second analysis shows that even among the subsample who only attended private schools, model fit improves when Montessori status is added.

Although wellbeing was still higher for Montessori compared to other participants, it is possible that this is because there is something about parents who choose *Montessori* (public or private) for their children that differs from other parents, and that it is those differences that lead to the better outcomes. This possibility was addressed in a third analysis by examining duration effects.

Particularly as children get older, duration of Montessori attendance would often reflect availability rather than parent choice. The option to attend Montessori after age 6 is limited, because Montessori elementary, middle, and high schools are far less prevalent than Montessori preschools; even Montessori elementary schools (for children ages 6–12) were extremely rare 30 years ago (when our average participant age was 6); Montessori elementary schools have gradually become more common, whereas Montessori high schools are still rare today. Because duration of Montessori attendance is often constrained by availability, self-selection is less of an issue in such an analysis, raising the odds that (were any significant effects found) the programs caused effects. Although this analysis was conducted because positive results would strengthen the possibility of causality, we caution that it is only a test of association.

Robustness Check/Alternative Specification #2

The subset of 853 respondents from the sample who had attended Montessori for at least 1 year in childhood was examined, omitting those who had never attended it (since such an analysis would in effect virtually repeat the initial analyses). This subset had an average age of 32.07 ($SD = 9.73$, range 18–61 years). They had attended Montessori for a mean of 7.88 years ($SD = 3.77$, range = 2–16 years) and conventional school for a mean of 7.36 years ($SD = 3.83$); 23% were male and 84% were White.

The SEM tested the association between years in Montessori and the latent factors, again controlling for age, gender, race, childhood SES, and proportion of schooling that was private. The model fit statistics are in **Table 2** and the regression coefficients and p -values are in **Table 8**. In this analysis, the SEM showed the

duration of Montessori was significant for two of the four factors (General Wellbeing and Engagement). For all four factors, the direction was positive: being in Montessori school for longer was associated with at least slightly higher scores on all factors.

This analysis suggests two possibilities. The first is the causal possibility, that Montessori schooling could cause positive wellbeing outcomes, but that for two of the factors, a threshold number of years delivers those outcomes, and extending beyond those adds little additional benefit to social trust or self-confidence. However, General Wellbeing, composed of variables aimed at life happiness, meaning, and sense of one's own competence, and Engagement (in one's activities and social world) might be strengthened by more time in a Montessori environment. Alternatively, it may be that parents who choose to and are able to (because they live in communities where it is available) keep their children in Montessori longer also give their children other experiences that promote even more General Wellbeing and Engagement, but not more experiences that promote more Social Trust and Self-confidence than were indexed by the initial choice.

DISCUSSION

The present research aimed to determine if Montessori schooling in childhood might *plausibly* lead to higher wellbeing in adulthood, because many features of Montessori schooling are known to cause higher wellbeing contemporaneously or predictively in other school and non-school situations. Based on this existing research, we developed a hypothesized model of how three Montessori program features—self-determination, meaningful activities, and social stability—might lead to three clusters of wellbeing outcomes—a general cluster including happiness, finding meaning in life, and feeling competent; another including engaging and seeking challenge in one's activities; and a third around a strong sense of community and social trust. Although we could not test that model directly, we could test its plausibility by seeing whether Montessori schooling was associated with latent factors aligned with those outcomes. Over 1900 individuals filled out a large set of wellbeing surveys and their responses were subjected to exploratory and confirmatory factor analyses, which arranged into four latent factors similar to those originally hypothesized, but with confidence in one's own thoughts and mind emerging as a distinct fourth factor, and the engagement factor including social engagement as well (see **Figure 1**).

To test the plausibility of the hypothesis about schooling, we conducted a structural equation model analysis to determine if at

least 2 years of Montessori schooling in childhood is significantly associated with adult wellbeing; the model accounted for the covariates of gender, race, age, childhood SES, and years in private school. The first analysis showed that Montessori was associated with higher scores on all four latent factors: General Wellbeing, Engagement, Social Trust, and Self-confidence.

This could be due to some feature of the parents; although the initial analysis controlled for SES, a different and unmeasured variable could be operating. The second analysis asked if something associated with selecting a private school for one's child might be the operational variable, and therefore tested whether Montessori would be significantly associated with higher adult wellbeing even among the subsample who attended private schools at least through age 17. For three of the four latent factors, it was: General Wellbeing, Engagement, and Social Trust; the fourth, Self-confidence (in one's thinking), showed a trend. Attending Montessori schooling for at least two childhood years was associated with higher wellbeing on these factors even among people who only attended private schools their entire pre-college lives.

Having parents who always had selected a private school was thus not responsible for the generally higher wellbeing associated with having attended Montessori observed in the initial analysis. Perhaps there is something associated with selecting Montessori specifically (whether public or private) that is associated with higher wellbeing. Although three studies that used dozens of measures (like parenting styles measures) to discriminate Montessori from other parents found no significant differences (Fleege et al., 1967; Dreyer and Rigler, 1969; Denervaud et al., 2020b), there must be some different qualities, and the present study rendered no way to examine those directly. However, Montessori enrollment, particularly as one gets older, is constrained by availability, yet the postulated unmeasured parent qualities would be expected to persist regardless of that availability. Therefore the third analysis examined whether duration of Montessori enrollment is associated with higher wellbeing. Duration of Montessori enrollment was associated with the latent factors of General Wellbeing and Engagement, but not Social Trust or Self-confidence, for which the direction of association was positive but non-significant. Either parents who choose Montessori schooling for their children, or something associated with such parents, also engenders these aspects of wellbeing, or very little (Montessori or postulated associate) exposure is needed to engender them.

However, General Wellbeing and Engagement were hypothesized to be influenced by Montessori features (see **Figure 1**), and are significantly and positively associated with duration of Montessori attendance (from 1 to 16 years). The latent variable of General Wellbeing was measured by scales concerning meaning in life and satisfaction with life, self-acceptance, vitality, and environmental mastery. Engagement was measured by variables tapping social contribution, social integration, positive relations, aspiring for personal growth, and a sense of purpose in life.

Although the associations with General Wellbeing and Engagement held across all three analyses, the study design does not allow one to determine if Montessori schooling caused

TABLE 8 | Analysis 3, effect of Montessori duration: means, SDs, standardized regression coefficients and *p*-values for SEM.

	β	<i>p</i> -value
General wellbeing	0.10	0.01
Engagement	0.06	0.04
Social trust	0.05	NS
Self-confidence	0.04	NS

higher wellbeing. An experimental design, in which children were randomly assigned to Montessori and then tested as adults, would be needed.

Lottery-Control Studies

Although we know of no long-term lottery control studies of Montessori education, two short term ones were described in the section “Introduction.” The two natural experiments conducted in the US show that high-fidelity public Montessori causes features associated with higher wellbeing, like stronger mastery orientation, executive function, social knowledge/skills, and academic performance (Lillard and Else-Quest, 2006; Moffitt et al., 2011; Reynolds et al., 2011, 2017; Sancassiani et al., 2015; Steinmayr et al., 2016, 2018; Haimovitz and Dweck, 2017; Lillard et al., 2017; Darling-Hammond et al., 2019). It is also plausible that having one’s children attend Montessori changes parents, and that the parents’ subsequent behavior led to higher adult wellbeing, but these natural experiment studies lend plausibility to the hypothesized model.

Predictive Features of Montessori for Improved Outcomes

Another support for the plausibility of the hypothesized model is that several of Montessori programs’ features, including the three highlighted here, predict higher wellbeing even when implemented in conventional school settings; these were discussed in the section “Introduction.” For example in classrooms where students are given more agency and opportunities for self-determination, they also have higher sense of their own competence and overall wellbeing (Ryan and Grolnick, 1986), and this is causal: When teachers were trained to increase students’ sense of self-determination, the students’ wellbeing increased (De Charms, 1976). Montessori work is highly engaging (Rathunde and Csikszentmihalyi, 2005a), and higher engagement leads to higher wellbeing (Csikszentmihalyi, 1990). Montessori also proffers social stability (3-year age groupings and teacher consistency) and (as indicated in research) stronger relationships (Rathunde and Csikszentmihalyi, 2005b; Lillard and Else-Quest, 2006). Strong relationships in childhood also predict higher wellbeing in adulthood (Olsson et al., 2013).

CONCLUSION AND LIMITATIONS

In sum, although this study only shows an association between Montessori schooling in childhood and higher adult wellbeing, lottery control studies and studies showing that features of Montessori schooling are associated with higher wellbeing in other settings lend weight to the possibility that Montessori might cause higher adult wellbeing. But if this is not the case—if in fact features of Montessori parents or some other third variable associated with Montessori attendance is the cause—then it would be very interesting to determine what the underlying cause for the discovered association is.

This study has several limitations in addition to its being a study of association rather than an experiment. One is that the sample was largely female and White, which is often the case for

internet survey samples (Smith, 2008; Peytchev, 2011; Boulianne, 2013). Other studies that have tested for gender differences in Montessori outcomes typically have not found them (Lillard and Else-Quest, 2006; Culclasure et al., 2018), and children of color particularly thrive in Montessori schools (Ansari and Winsler, 2014, 2020; Brown and Steele, 2015; Brown and Lewis, 2017; Culclasure et al., 2018; Lillard et al., in press; Snyder et al., 2021). Ansari and Winsler (2014, 2020) found that only Hispanic children thrived, but many other studies show Black children thrive in Montessori as well. Furthermore, race and gender were accounted for in our models. Still, in an ideal sample, gender and race would be representative of the population, and future research should strive for a representative sample.

A second limitation concerns variation in Montessori implementation. Although the core Montessori features we discussed—self-determination, meaningful activities, and social stability—likely characterize all Montessori schools, variations in implementation might accentuate or mitigate them. For example, we have seen Montessori elementary classrooms that require students to fill out checklists of their work activities in ways that likely reduce feelings of self-determination in those classrooms. Studies showing the strongest Montessori outcomes involve high fidelity Montessori implementation (Lillard, 2019). Here, we have no information regarding the fidelity of implementation in the classrooms the adults attended. In future research, it would be useful to gather information on implementation fidelity and examine whether it varies with student wellbeing.

Another limitation is that participants knew the purpose was to consider the impact of alternative schooling on one’s life, and this could have biased people’s responding, although the direction such bias might take is unclear. If one has fond memories of school, whether it was conventional or Montessori, and one knows one is doing a survey about the impact of school on current wellbeing, one might answer more positively; if one has negative memories, one might answer more negatively. Thus, while it is unclear the direction in which knowledge about the survey’s purpose might bias any individual’s responses, in the future one might administer surveys without providing a description of the purpose. This might be difficult to do while obtaining a large sample of alternatively schooled individuals, since alternative schooling is relatively rare (based on other data from our laboratory, we estimate that 5% of American college students attended a non-conventional school at some point). Participants did not answer questions about the types of schools they attended and when until the end of the survey, which might have reduced attention to this aspect of the study until the surveys were complete, but biased responding is a limitation in survey research, particularly when it concerns subjective qualities.

Yet another limitation comes from recruitment itself. In order to get a large enough Montessori sample, Facebook ads were run in communities where Montessori schools are more abundant, such as Washington D.C., Minneapolis/St. Paul, and Milwaukee which have long had Montessori teacher training programs. Although these ads should also have recruited conventionally schooled people in those cities, it is conceivable that the study’s external validity is compromised by the strategy, because there are regional differences in wellbeing (Lawless and Lucas, 2011).

For example, at the county level, life satisfaction is highly positively correlated with household income, and negatively correlated with the percentages of persons living in poverty and unemployed. The cities where Facebook ads were run varied in different ways on these metrics. For example, relative to the US average in 2018, there were higher rates of poverty and unemployment and lower median income in Milwaukee, favorable levels of all three metrics in Minneapolis, and varied levels in DC (high poverty coupled with low unemployment and high median income). Such regional variation could in part explain the levels of wellbeing in the adults sampled here, and future research should control for region to measure its contribution to wellbeing.

A further limitation concerns internal validity: We asked people to recall what type of school they attended each year from when they were 2–17, with seven options ranging from Did Not Attend to Homeschool. Some people might not have remembered their school type but guessed a type, which would produce noise in the data, rendering our results less reliable. In general, people's memories for childhood experiences are thought to be "substantially accurate" (Brewin et al., 1993, p. 84), and memories for what type of school one attended, for almost a full year, during each childhood year, is likely to have been rehearsed in the family, lending a degree of confidence to the generally accuracy of the school data. Still, there are likely to be some inaccuracies in the data regarding school history.

In sum, wellbeing is a multidetermined but very important human outcome. If childhood schooling were to influence adult wellbeing, the public health implications would be very important. Pedagogical environments that support children to become adults with high levels of wellbeing are desirable. Although there are important limitations, the research presented here suggests that Montessori schooling might be associated with higher adult wellbeing, and that a causal relation between Montessori schooling in childhood and wellbeing in adulthood is at least plausible.

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DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the University of Virginia Institutional Review Board for the Social and Behavioral Sciences. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

AL conceived of the study, contributed theory, raised funds, oversaw the entire project, did some data analysis, and wrote the manuscript. MM conducted the data analyses. DV and EF selected stimuli in collaboration with AL, recruited participants, put the surveys on Qualtrics, ran the study, worked with MM to prepare the data file, and contributed to the manuscript. DV ran some analyses. All the authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.721943/full#supplementary-material>

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Unintended Positive Consequences of Development Centres in University Graduates

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This study investigated development centres as a method to improve the generalised self-efficacy of university graduates. This research was motivated by the various challenges, graduates face in order to successfully transition into the world of work. Although there is a general scarcity of skills in many emerging economies like South Africa, graduate unemployment rates remain high. Additionally, graduates are not making the immediate impact that employers would expect due to a lack of technical and “soft skills.” General self-efficacy is an important attribute for job applicants because it provides them with the confidence to solve problems efficiently. The primary research objective was to identify whether the generalised self-efficacy of graduates can be positively affected by a development centre approach in the short-term and long-term. The sample population for this research included Industrial Psychology graduates at a select university in the Western Cape, South Africa ($n = 17$). A quasi-experimental methodology was implemented where an intervention group ($n = 7$) and a control group ($n = 10$) were taken through a development centre approach. The results of the intervention indicated that a development centre approach has a positive impact on self-efficacy levels over the short and medium term. Results from the study emphasise the importance of self-efficacy in graduate employability and indicate how development centres can be used to improve self-efficacy levels. The findings of this study provide a basis for future research into the further development of graduate self-efficacy and the potential benefits for first time job seekers.

Keywords: development centres, graduate employability, self-efficacy, competency-based assessments, social cognitive theory

INTRODUCTION

One way of reducing poverty is by increasing employment rates throughout the various sectors of the economy. Voluminous research suggests that a fast growing and inclusive economy presents the best long-term strategy to roll back income inequality, unemployment, and poverty (Hoeller et al., 2014; Sulla and Zikhali, 2018). For this reason, the South African National Development Plan (NDP) aims to meet its laudable 2030 goals by providing more broad-based employment through faster economic growth, improving the quality of education, and building a capable state (National Planning Commission, 2012). However, several structural challenges hamper economic growth and broad-based employment including low investment in basic infrastructure, inflexible labour laws, low levels of labour productivity, and the high cost of doing business in

South Africa. These trends have limited the ability and willingness of the private sector to employ graduates produced by the tertiary education sector over the last 20 years (Tremblay et al., 2012; Humburg et al., 2013; Mlambo et al., 2021). Although South Africa has always been characterised as a country with high unemployment rates, especially amongst semi-skilled or unskilled workers, this trend is now extending to skilled employees as well. Statistics South Africa (2021) reports growing unemployment rates of 34.4% in quarter 2 of 2021, with the burden of unemployment squarely shouldered by the youth (aged 15–34 years). The report goes on to reveal substantially higher unemployment rates for youth, amounting to 64.4% for youth aged 15–24, and 42.9% for those aged 25–34. It also suggests that even graduates of tertiary education programs are not guaranteed work in South Africa, with 11% of graduates finding themselves unemployed in Q2 2021 (Statistics South Africa, 2021). This presents a developmental issue not only faced by students, but also by organisations, tertiary institutions, and the nation as a whole (Okeke-Uzodike and Naude, 2018).

Developing employable graduates who display desired graduate attributes is an important starting point in reducing the high unemployment rates of graduates. As previous research has indicated, organisations seek graduates with a combination of skills, such as problem solving skills, leadership skills, interpersonal skills, and communication skills (Lowden et al., 2011; Awan and Ameen, 2020). However, with the lack of exposure to the working world, graduates may not have access to development opportunities to improve their employability. Du Preez et al. (2019) recommend the necessity for metacognitive competence development to help graduates develop an understanding of their own skills and what is required in the workplace. Hamilton et al. (2015) add by stating that only when the development of practical and fundamental skills is prioritised will graduates become employable.

Developing confidence in graduates is an important step in preparing them for the challenges and opportunities represented by the world of work. When graduates have a high level of self-efficacy, they are more courageous in taking risks, they make better decisions, and they are able to tackle challenges efficiently, and can set stimulating goals and commit to them. They also experience lower levels of stress, anxiety, and depression, and put more effort and perseverance into learning challenging tasks (Luthans and Avolio, 2007; Petruzzello et al., 2021). As a result, graduates can benefit from impactful efforts at improving self-efficacy and employability, such as coaching and mentoring programmes, work-integrated learning methods (Freudenberg et al., 2010), job shadowing, competency-based curricula (Muraraneza et al., 2017), and development centres. While the competencies that these methods of developing graduate employability are pivotal to students' future professional success, the underlying benefit of this development – self-efficacy – is also important to their personal growth and maturity.

The Role of Higher Education in Developing Graduate Self-Efficacy

According to Brits (2018), tertiary institutions play a critical role in both enhancing graduate employability, and in impacting

the national economic growth. Education plays a pivotal role in the NDP of 2030, to spur growth, and broaden employment opportunities. In this regard, higher education in South Africa plays a key enabling function. Moolman (2017) states that tertiary institutions can assist graduates in achieving employability by embedding this concept in learning programmes and lectures, incorporating work experience into the academic curriculum, and introducing development assessment practices. One way in which tertiary institutions can contribute to this transformation is by introducing elements of development centres into their teaching practice, since development centres offer numerous benefits that may improve academic performance and employability (Van Wyk and du Toit, 2018). Jacobs et al. (2018) state that graduates benefit from assessment centres regardless of the career they aspire towards, and are provided with structured feedback that guides their steps towards future development. A longitudinal study by Jacobs et al. (2018) found that over a 10-year period, assessment centres developed the skills and abilities of all graduates who participated, irrespective of their position. Although the primary goal of development centres is to diagnose the key strengths and weaknesses of participants, one of the most important and overlooked benefits is the development of generalised self-efficacy.

Assessment and development centres can thus play a critical role in nurturing the competencies crucial to job success by creating self-awareness and boosting self-efficacy. This study, therefore, proposes that development centres have the potential to increase self-knowledge and awareness regarding the strengths and weakness of participants, while boosting self-efficacy in the short and long term. This in turn is likely to improve the employability of students and assist them to make an immediate impact in the organisations that employ them.

The next section will look at the theoretical basis of generalised self-efficacy generally and, more specifically, at the links with competency-based assessments.

THEORETICAL BACKGROUND AND HYPOTHESES

Graduate Employability

Graduate employability can be simply described as the degree to which graduates possess the knowledge, attributes, skills, and attitudes to attract interest from employers, and ultimately to provide meaningful contributions to the workplace and the broader economy (Tomlinson and Nghia, 2020). While many employability models have been developed, Understanding, Skills, Efficacy, and Metacognition (USEM) model of Knight and Yorke (2002) has gathered substantial support from contemporary researchers in the area (see Soares et al., 2017; Bennett and Ananthram, 2021). The essence of the USEM model is that it requires more than just generic skills or a qualification to be considered employable, and that these components are interdependent.

An additional employability framework developed by Dacre Pool and Sewell (2007), known as the CareerEDGE model shows the foundation required for employability, along with

the direction and relationship of further competencies required from graduates to develop their employability. The foundation of this model displays a degree of competency overlap, for example, work experience may be essential to career development learning, but may also inform degree subject learning relevant to an individual's course of study. It is thus evident that although self-efficacy plays a crucial part in graduate employability, so does the access to development opportunities as represented in the five aspects of the CareerEDGE model foundation. Implementing creative opportunities for graduate development, such as job shadowing, industry visits, and development assessment centres, would be impactful in achieving both higher levels of confidence and employability. It is interesting to note that both the USEM model and CareerEDGE model consider reflection/metacognition, self-efficacy, basic skills, and a level of work experience/understanding to be important to building employable graduates.

Furthermore, Jones (2015) presents a model of employability that is informed by one's skills, confidence, and self-regulated learning. This model proposes that employability requires individuals who are confident and have the ability to manage their learning and skills. Jones (2015, p. 17) proposes a definition of employability as the "ability and attitude to apply and adapt knowledge and skills to current and future opportunities across a career path enabling contribution to a range of occupations in public, private, or not-for-profit sectors." The underpinning concepts of this employability model display the need for knowledge and skills; the need for individuals with self-regulated learning abilities who are capable of adapting and broadening their knowledge; and the need for individuals to confidently apply one's knowledge and ability (self-efficacy; Zimmerman, 1990; Bandura, 1995; Jones, 2015). This model proposes a virtues cycle between the skills that a person has obtained, their level of self-efficacy and self-regulated learning. The starting point of the process is largely unclear, but it seems logical that high levels of self-efficacy will enable self-regulated learning, which ultimately leads to greater efficacy in the workplace and employability. This cycle continues indefinitely through the graduate's career, where bigger or more complex tasks require the acquisition of skills through self-regulated learning.

Another well-known employability model is conceptual model of graduate attributes of Bridgstock (2009) for employability that includes career management skills. This model proposes the importance of career management skills in achieving employability (i.e., variation of high-impact and long-term career capabilities), including one's ability to intentionally self-manage and actively seek prospective opportunities (Bridgstock, 2009). Although having the relevant and desired skills is necessary in achieving employability, this model also sheds light on the underpinning traits and dispositions that are a critical component of employability. These underpinning traits and dispositions (e.g., sociability, taking initiative, willingness to learn, openness to experience, and self-efficacy) are known as the foundation of successfully developing and applying career management skills (Jarvis, 2003; McMahon et al., 2003; Bridgstock, 2009; Hoeller et al., 2014). Although self-efficacy is recognised as an underlying characteristic in achieving

employability throughout various employability models, it proves to be a critical attribute to graduate employability success. Pinquart et al. (2003) agree by making mention of the importance of one's motivation and self-efficacy, which play a pivotal role in a graduate's transitional experience from the academic environment to the work environment.

The various theoretical employability models indicate that self-efficacy plays a rather important role in graduate employability, either as a direct effect or as mediator. A positive correlation between self-efficacy and employment search behaviour and graduate employment results has been found (Moynihan et al., 2003; Pinquart et al., 2003). Moreover, self-efficacy is also positively linked to academic achievement, motivation constructs, and self-controlled behaviour (such as awareness of learning methods utilised and time taken; Lowden et al., 2011; Morrison, 2014; Gharetepeh et al., 2015). Further studies have demonstrated that self-efficacy positively correlates with career adaptability (Öncel, 2014; Atitsogbe et al., 2019), as well as demonstrating higher levels of self-efficacy linked to higher levels of perceived employability (Ngo et al., 2017). Developing confident graduates is important for the preparation of facing unfamiliar challenges and opportunities that the ever-changing working world presents. Jones (2015) agrees by stating that those with high confidence levels are deemed as more employable due to their belief and ability to apply preferred behaviours and ways of work that lead to successful outcomes.

Self-Efficacy

Self-efficacy forms the core mechanism for developing an individual's motivation to exercise control over situations that affect their life (Sanchitra and Bandara, 2017). Self-esteem describes an individual's belief regarding their ability to manage and carry out motivation, cognitive resources, and courses of action that will guide them to the success of specific tasks (Simons and Buitendach, 2013). This definition proposes that efficacy relates to the achievement of a precise task and is situation-specific. In addition to this, Bandura (1997) stated that the social-cognitive theory of self-efficacy is multi-faceted and varies across multiple circumstances and tasks.

Efficacy is not a trait, but rather a general capability that evolves over time and experience (Mazaheri and Yazdani, 2016). This belief is primarily shaped by four sources within self-efficacy, namely, mastery experience, vicarious experience, verbal persuasion, and physiological arousal. Allison and Keller (2004) discovered that a self-efficacy intervention involving all four self-efficacy development mechanisms led to advanced developments in older adult's physical activity performance. Moreover, self-efficacy plays an important role not only in the work environment, but also in an individual's everyday lifestyle (Lunenburg, 2011).

Studies have also shown that self-efficacy plays a mediational role in student's selection of career choices. Studies of Pajares (2003) indicated that self-efficacy beliefs impact the choice of majors and career paths of tertiary students. Moreover, Pajares (2003) outlines those undergraduates tend to choose majors and career paths based on the fields they feel most proficient in and deter from those fields that they believe they are less

proficient in or are less able to compete. Views of Bandura (1994) underscore this by stating that the higher an individual's level of perceived self-efficacy, the wider the variety of career paths they seriously consider, the more interest they show in diverse career paths, and they are generally better prepared to deal with success and failures. Moreover, research shows that in relation to academic achievement, individuals with lower levels of self-efficacy achieve lower levels of academic success and continuous failure may lead to learned helplessness (Juan et al., 2018). Learned helplessness is a psychological state where an individual avoids tasks that require persistence, interpret failure as a result of their lack of skills, negatively perceive tasks as challenges, and display a lack of commitment (Filippello et al., 2020).

Generalised self-efficacy is important for ongoing career success, but may also be very important during the application and recruitment process for graduates. While recruitment is a stage in achieving employment, many graduates experience the assessment and interviewing process for the first time, leaving them anxious and not knowing what to expect, impacting their confidence. Research on interviewing self-efficacy conducted by Tay et al. (2006) found that receiving feedback on interview performance influences an individual's self-efficacy levels over time. This proves that job seekers with higher levels of self-efficacy in interview capabilities typically receive more work opportunities. Thus, the influence of higher levels of self-efficacy influences graduates' success in the application process as well as their job success.

Competency-Based Assessments

Competency-based assessments are popular in South Africa to assess managerial and graduate potential. It is believed that South Africa is the third largest user of assessment and development centres amongst 82 other countries internationally (Mulder and Taylor, 2015). The approach's popularity in South Africa can be ascribed to a number of factors, but one of the biggest drivers is the gap in quality education and formal training between various racial groups. Standardised assessments, especially those related to the assessment of cognitive ability, often highlights the contrast and inequality in education quality, resulting in large group differences between racial groups (Laher and Cockcroft, 2013). In light of South Africa's history, perceived fairness, and cultural appropriateness is very important. The use of psychological measures is also legally mandated by the Health Professions Act (Republic of South Africa, 1974) and the Employment Equity Act (Republic of South Africa, 1998), and their use is restricted if they are not able to demonstrate ethnic and gender fairness. Generally, competency-based assessments are regarded as fairer by participants due to the high degree of fidelity between the simulations and real-world work situation (Thornton et al., 2015). Internationally, Competency Based Assessment also leads to smaller ethnic and gender group differences (Leong and Park, 2016). Additionally, competency-based assessments are strongly linked to current and future job performance (Al-Mannaee and Ryan, 2018).

As highly valued processes, assessment and development centres are actively utilised for purposes, such as recruitment, development, and retaining talent within organisations (Callow, 2010). These multi-purpose centres are known as a standardised process whereby multiple raters evaluate participant's performance against pre-defined competencies which are assessed through a series of job-related simulations. These pre-defined competencies are related to the requirements and behaviours of a specific role. Typically, a development centre process usually occurs over a day or number of days where participants are asked to participate in and engage with a number of on-the-job simulations (Ballantyne and Povah, 2017).

Assessments may be conducted either by utilising the paper-pencil based technique or through electronic (simulated) assessment, thereby presenting participants with the opportunity to display their competencies in the given tasks (Mohamad et al., 2013). Assessment and development centres have many advantages, such as: (1) being able to measure complex characteristics, (2) seen as fair and valid and fair by those who participate in them, (3) has diminutive adverse impact, and (4) predicts a variety of criteria (Strudwick, 2017). The main difference between an assessment and development centre is that the former is utilised for selection purposes and the latter for personal and professional development purposes, which leads to organisational and team development (Sukalova and Hraskova, 2006).

Organisations benefit from development centres in aspects, such as (1) being seen as impartial and a robust approach to enhancing the employees' and the organisations' awareness of the individual's skills, strength, and development areas, (2) by providing a unique opportunity to objectively observe and evaluate how employees execute tasks and activities, make decisions, relate to others, and exhibit self-awareness, and (3) acting as an effective tool for determining essential behaviours that are seen as imperative to employees' current success and future potential (Sukalova and Hraskova, 2006). These same benefits may be beneficial in a classroom environment if development centres provide graduates with the opportunity to learn new skills, acting as a source of career preparation, boosting student confidence by developing self-awareness and illuminating blind spots, and acting as an objective resource to develop graduate attributes required by careers. The next section will look at the link between self-efficacy and development centres by framing the research problem and objectives in this study.

The Link Between Self-Efficacy and Development Centres

Graduate self-efficacy is vital to academic and employability success since it is instrumental in overcoming obstacles, managing stressful situations, and achieving personal and professional goals. General research findings support this assumption, suggesting that the level of one's self-efficacy has implications for changes in behaviour, stress management, and academic and career choices (Gharetepeh et al., 2015; Juan et al., 2018). On the other hand, those who have a weaker sense of

self-efficacy have low ambitions and weaker commitment to goals, retreat from difficult tasks, dwell on adversity, are slow to gain confidence after experiencing failure, and easily encounter stress and depression (Mlatsheni, 2012).

The role of self-efficacy is important to graduate career and academic progression. Graduates typically face a myriad of stressors, and overcoming these professional, educational, and personal challenges is often the difference between success and failure. Bandura (1997) positions self-efficacy as a critical component in the amount of effort and perseverance applied to activities and tasks. This, in essence, speaks to an individual's performance and persistence in achieving success in a specific task or situation. Numerous studies support the link between high levels of self-efficacy and scholastic achievement (Oriol-Granado et al., 2017).

Self-efficacy is influenced by an individual's past experience of successes and failures, second-hand experience of the success and failure of others, developmental feedback, and the set of somatic-emotional reactions attached to performance beliefs. This touches on four sources of self-efficacy of Bandura (1997) discussed previously. Paton and Jackson (2002) states that development assessment centres act as a source of directly gained experience that incorporates behavioural modelling (which includes several participants), feedback, and opportunities to understand and develop methods of improvement that leads to improvement in self-efficacy, effort, and persistence. In this regard, Development Centres can initiate and activate the four processes that lead to higher levels of self-efficacy.

Studies conducted by Creed et al. (2001) found employability-enhancing interventions, like training and education, to positively lead to higher levels of confidence and esteem in unemployed individuals. Development centres also act as a source of training and a knowledge sharing tool. These centres provide a platform for graduates to acquire diverse skillsets, be equipped with desired graduate employability attributes and competencies, receive developmental feedback on ways to improve, and gain the confidence and belief to apply learnt abilities for prospective employment opportunities. While programmes and initiatives such as development centres are a useful tool in developing individuals, most of the time these opportunities are voluntary. Thus, graduate willingness to learn and ongoing growth mindset, are important attributes in achieving personal and professional success.

With the rapid and pervasive changes in the global, political, and economic systems, one of the key success factors is the ability of graduates to continuously learn and remain agile. Xing and Marwala (2017) concur by mentioning how globalisation, the fourth industrial revolution, the increasing demands for tertiary education, increasing competition, and collapsed geographical restrictions, have forced higher education into an extremely competitive environment where ongoing growth and education are critical for survival. To add to this pressure, graduates as new employees are expected to add value to organisations from the first day at work (Brits, 2018). This pressure to perform can have a profound impact on graduates and a high level of self-efficacy may be the key differentiator between initial success and failure.

This study proposes that development centres act as a useful intervention to improve graduate self-efficacy. The development centre is grounded in essential graduate employability attributes, appropriate assessment techniques, and ongoing development feedback that are applied in university settings. This application of development not only exposes graduates to real-life work simulations that improves their self-awareness and specific skills, but also creates a higher level of graduate self-efficacy. This sense of higher self-efficacy leads to the belief of successfully applying one's gained knowledge and abilities to prospective career opportunities. Having the belief to apply one's abilities (i.e., self-efficacy) is more significant than merely having the ability (Yorke, 2006).

Research Objectives and Substantive Hypotheses

The primary objective of the study is to investigate the role of a development centre on generalised self-efficacy of graduate students. The secondary research objective is to investigate if the change in self-efficacy has a short-term or longer-term effect.

Based on the research objectives and the literature review, theorising suggests that graduate self-efficacy should increase over the short and long term once the graduates have gone through a development centre intervention. The following specific hypotheses guide the inquiry:

Hypotheses 1: A development centre intervention has a short-term effect on the generalised self-efficacy of graduate students.

Hypotheses 2: A development centre intervention has a longer-term effect on the generalised self-efficacy of graduate students.

MATERIALS AND METHODS

Participants

Due to the nature of the study, a non-probability convenience sampling technique was used. The population for this study consisted of graduate students who were in the process of completing their graduate studies (Honours level) at a residential public university in South Africa. The population consisted of 95 postgraduate students. Out of the total number of 95 students, 17 graduate students volunteered to partake in the research project of which seven students were part of the intervention group, and 10 formed part of the control group. **Table 1** represents the study sample characteristics for both the control group and the intervention group.

The information summarised in **Table 1** suggests that most of the respondents were female in the control group (70%), Coloured (80%), single (80%), and English as primary home language (60%). In contrast, the intervention group was mostly more balanced with 57.1% males, Black (42.9%), single (85%), and with English as the primary home language (28.6%). Racial categorisation reported is aligned to the Employment Equity Act definitions (Republic of South Africa, 1998).

TABLE 1 | Sample sociodemographic characteristics.

Variable	Control group (n = 10)		Intervention group (n = 7)	
	Frequency	Percentage	Frequency	Percentage
Gender				
Male	3	30.0%	4	57.1%
Female	7	70.0%	3	42.9%
Race				
Black/African	2	20.0%	3	42.9%
Coloured	8	80.0%	2	28.6%
Indian	0	0.0%	1	14.3%
White	0	0.0%	1	14.3%
Nationality				
South Africa	9	90.0%	6	85.7%
Zimbabwe	1	10.0%	1	14.3%
Marital status				
Married	2	20.0%	1	14.3%
Single	8	80.0%	6	85.7%
Home language				
English	6	60.0%	2	28.6%
Afrikaans	2	20.0%	2	28.6%
Shona	0	0.0%	1	14.3%
Swati	0	0.0%	1	14.3%
Zulu	0	0.0%	1	14.3%
Xhosa	1	10.0%	0	0.0%
Ikwerre	1	10.0%	0	0.0%
Work experience				
None	2	20.0%	1	14.3%
<6 months	3	30.0%	2	28.6%
>12 months	5	50.0%	4	57.1%

Tools

In this particular study, two methods of data collection were utilised, namely questionnaires, and a development centre as the intervention. The development centre consisted of an in-basket assessment and a competency-based interview.

Generalised Self-Efficacy Questionnaire

In both the control and intervention group, the Generalised Self-Efficacy questionnaire (Schwarzer and Jerusalem, 1995) was administered before and after the development centre intervention. The general self-efficacy questionnaire is based on an individual's general beliefs in their ability to respond to and manage environmental demands and challenges (Schwarzer, 2014). This instrument consists of a 10-item self-report questionnaire, scored on a four-point Likert Scale with 1 being "not at all true," 2 being "hardly true," 3 being "moderately true," and 4 being "exactly true." The instrument generally demonstrates strong internal consistency, and Cronbach alpha values ranging between 0.75 and 0.91 have been reported in applied studies (Scholz et al., 2002). In addition to this, the criterion-related validity of the instrument correlates positively with favourable emotions, optimism, and work satisfaction (Schwarzer and Jerusalem, 1995). On

the other hand, negative correlations were identified between generalised self-efficacy and depression, anxiety, burnout, stress, and health complaints (Schwarzer and Jerusalem, 1995). These findings provide support for the divergent and convergent validity of the measure. The measure is conceptualised to be uni-dimensional (Scholz et al., 2002) and includes statements such as "It is easy for me to stick to my aims and accomplish my goals," "I can solve most problems if I invest the necessary effort," and "When I am confronted with a problem, I can usually find several solutions."

Development Centre Intervention

For this study, the development centre intervention included an in-basket assessment and a competency-based interview. An in-basket assessment is a tool and activity used to see how an applicant performs job-related duties within a given timeframe (Roberts, 2018). In-basket assessments require applicants to take action and structure a response of an employee in a hypothetical position on items, such as e-mails, memos, reports, records, and meeting minute requests (Schippmann et al., 1990). Moreover, competency-based interviews, also known as structured interviews, are interviews that have questions designed to elicit responses that allow the interviewers to measure the candidate against the competency profile developed for the position (Warech, 2002).

For the purpose of this study, only the intervention group participated in the development centre intervention. The intervention group completed a pre-test questionnaire (i.e., self-efficacy questionnaire), an in-basket assessment, a competency-based interview, and a post-test questionnaire (i.e., self-efficacy questionnaire) immediately after the development centre. The control group completed the generalised self-efficacy questionnaire prior to the start of the development centre intervention and 3 months after the development centres.

The development centre was made up of six raters, who were trained on frame of reference training. Raters worked in pairs, with each pair assessing three candidates for the in-basket and competency-based interview. An observer guide was developed as preparation material for each rater. This guide contained the assessment competency guide, assessment material, observer programme, and rating sheets. All of the raters were graduate students in the process of completing the final year of their Masters coursework. As part of a module in Advanced Assessment (BPS 820) they received extensive training on the principles of observing, recording, classifying, and evaluating behaviour against the competency framework. All the raters were coloured and female.

The in-basket and competency-based interview assessments were developed to assess 10 main competencies. These competencies are relevant knowledge, planning and organising, oral and written communication, action orientation, ability to learn, attention to detail, analytical thinking, adaptability, and initiative. The competencies were derived by reviewing various job descriptions of an Industrial Psychology entry level

professional. Moreover, Industrial Psychologists across various organisations were consulted on their perspective of core competencies that graduate Industrial Psychologists require. This was then cross referenced and analysed against universal competencies in order to derive the final competencies. These competencies with associated definitions can be viewed in **Table 2**.

The assessments were rated on a five-point Likert rating scale. The competencies and respective behavioural indicators were utilised as a guide when rating participants, while the rater utilised a Behavioural Observation Scale (BOS) approach. The five-point Likert scale rated 1, being well below requirements or no evidence of behavioural indicator or response; 2, being below requirements; 3, being meets most requirements with development; 4, being above requirements, and lastly 5, being well above requirements or answers all behavioural indicators and does much more than required.

Once all simulations had been conducted, the raters were required to go through a data-integration session where participants' scores were discussed, and scoring was finalised. The data-integration session was where the raters came to a consensus around participant scores by comparing participant results that were aligned to the agreed competencies and behaviours. Thereafter, participant development reports were written, password protected, and sent *via* email communication directly to the researcher and supervisor to send out to the respective participants.

Procedure

The research study was presented to the study population and students could volunteer to take part. The group of graduates that were available to take part in the development centre on the advertised date was assigned to the intervention group, while applicants that were not available were considered for the control group. The development centre was conducted in a centralised venue on campus due to ease of access for all participants. On the day of the intervention, the intervention group was required to complete the informed consent form, self-efficacy questionnaire (pre-test), a demographic questionnaire, go through the development centre programme (i.e., in-basket assessment and a competency-based questionnaire), and then complete the self-efficacy questionnaire again. The control group was required to complete the informed consent form, self-efficacy questionnaire (pre-test), and a demographic questionnaire only. Three months later both intervention and control groups were given a post-test self-efficacy questionnaire to complete. Once the intervention concluded, each participant received an email thanking them for their participation in the study, while the intervention group additionally received an assessment report for their participation in the development centre. In addition to the written report, verbal feedback was provided for the candidates that participated in the development centre. The candidates that were allocated to the control group were given the opportunity to participate in the annual development centre that would take place at the same time 1 year later. None of the respondents in the

TABLE 2 | Competency grid.

Competencies	Assessments	
	In-basket activity	Competency-based interview
Relevant knowledge and skill <i>Possessing the necessary knowledge and skills to meet the job demands.</i>	X	X
Planning and organising <i>Organising information and determining courses of action for oneself and others, taking relevant factors into account.</i>	X	X
Communication – Oral <i>Effective two-way communication with others, including verbal and gestural expression, and listening.</i>	–	X
Communication – Written <i>Clear written expression of ideas or information.</i>	X	–
Action Orientation <i>Willingness to take action to accomplish tasks, maintaining a high level of motivation and energy.</i>	X	X
Ability to learn <i>Ability to assimilate, understand, and apply new information.</i>	–	X
Attention to detail <i>Taking relevant and complex details into account.</i>	X	X
Analytical thinking <i>Understanding a situation by breaking it apart into smaller pieces or tracking the implications of situations in a step by step way.</i>	X	X
Adaptability <i>Maintaining effectiveness in varying environments and with different people, tasks, and responsibilities.</i>	X	X
Initiative <i>Originating action and taking the initiative without having to be prompted.</i>	X	X

control group opted in to participate in the development centre the following year.

After all data were received, the researcher reviewed, analysed, and contextualised the data through excel and SPSS (IBM Corp, 2015).

Statistical Analysis

As the design of this study involves assessing self-efficacy across both time (pre- and post- assessment center intervention) and cohorts (treatment and control), analysis was challenged by the potential for baseline differences in treatment and control group self-efficacy levels. This presents an additional source of error when attempting to compare changes within cohorts, between cohorts. Further, small sample have low statistical power to detect type II errors, which was a concern in the current study.

Typically, inter-group differences (whether groups are independent or dependent) are assessed by parametric test (equivalence testing in SEM or Independent *t*-test). Because of our small sample, this test will not be possible, as the *t*-test assumes certain distribution characteristics including multivariate normal distribution of continuous scores (Krieg, 2020). The Mann-Whitney U Test is among the preferred non-parametric alternatives to the *t*-test, and was selected because the approach overcomes some of the stringent data requirements of parametric test (Fay and Proschan, 2010). Further, the ranking system utilised by the Mann-Whitney U test effectively standardizes the distributions under analysis (Fay and Proschan, 2010), limiting any concern over error produced by baseline inter-group self-efficacy differences.

In order to evaluate the differences across time, the Friedman (1937) test was utilised. The Friedman test is a non-parametric alternative to one-way repeated ANOVA. Significant results on the Friedman Test suggest that intragroup differences are detected over time (Krieg, 2020). The Friedman Test was followed up with Wilcoxon Signed Rank test to test for *post-hoc* differences across time. In the current investigation, time 1 was considered the baseline reading and was used to compare changes at time 2 and 3.

Ethical Considerations

Anonymity and confidentiality were taken into account in the informed consent form by explaining the purpose of the study, researcher details, that the participant will remain anonymous, that their responses in the study will remain confidential, that participation is voluntary, and any personal identity will not be shared with any third parties or vendors. This study has also undergone ethical clearance through the University's ethics committee.

RESULTS

The primary goal of the study was to investigate the following hypotheses:

Hypotheses 1: A development centre intervention has a short-term effect on the generalised self-efficacy of graduate students.

Hypotheses 2: A development centre intervention has a long-term effect on the generalised self-efficacy of graduate students.

In order to test these hypotheses, a within-between subject research design was utilised. The first step was to test if there were any significant intergroup differences at time 1 between the intervention and control group. This was followed up by testing for difference between the group at time point 3s. This was done by means of the Mann-Whitney U test, a non-parametric test, due to the small sample sizes of the control and intervention groups.

The “within” part of the research design was carried out using the Friedman Test followed by the Wilcoxon signed rank test. In each of the analyses, time 1 (pre-intervention) was used as the baseline measure. In other words, the immediate (i.e., short term) effect was assessed by comparing time 1 with 2, and the long term effect was tested by comparing time 1 with time 3. If the Wilcoxon signed ranks indicate a significant change between time 1 and time 2, this change can be considered a significant immediate effect. If the change between time 1 and 3 is significant, it is considered a significant long-term effect.

Tests for Mean Differences in Self-Efficacy Between the Intervention and Control Group (Mann-Whitney U Test)

The information in **Tables 3, 4** suggest that that for time 1 (SE_T1), the Mann-Whitney U Test revealed that there was no statistically significant difference in the mean scores in the graduate's self-efficacy levels for the intervention group (Mean Rank=9.14, $N=7$) compared to the control group (Mean Rank=8.90, $N=10$); ($U=34,000$, $z=-0,098$, $p=0.922$, $r=-0.00033$).

The mean rank values for the control and intervention groups are displayed in **Table 3**. The significance test between groups at time 1 and 3 is displayed in **Table 4** below. **Table 4** suggests that there is no statistically significant difference in the graduate's self-efficacy levels for the intervention group (Mean Rank=10.50, $N=6$) and the control group (Mean Rank=7.30, $N=10$); ($U=18,000$, $z=-1,319$, $p=0.187$, $r=-0.00456$).

The results from the foregoing analyses suggests that there were no statistically significant differences between the control and intervention group on generalised self-efficacy at time 1 and time 3.

Tests for Mean Differences in Self-Efficacy Over Time (Friedman Test)

The Friedman test is the non-parametric test which is a non-parametric alternative to the one-way ANOVA with repeated measures. This test is utilised to test for differences between groups when the dependent variable being measured is ordinal (Laerd Statistics, 2018).

The mean ranks and significant tests for the intervention group are presented in **Tables 5, 6**. The test statistics in **Table 6** indicated that there was not a statistically significant difference in the intervention group's self-efficacy levels across time 1 (SE_1) which is the pre-intervention, time 2 (SE_2) which is the post-intervention, and time 3 (SE_3) which is the post 3 month follow up. This is indicated by a non-significant value of p of 0.247. Comparing the Mean Ranks across time 1, time 2, and time 3 shows that there was a practical significant increase in the intervention groups self-efficacy levels over time. From time 1 to 2, there was a 5.8% increase in the mean value and 7.6% increase between time 1 and 3. However, due to the relatively small sample size, this increase in Self Efficacy over time was not statistically significant (**Table 7**).

TABLE 3 | Ranks table.

Group		N	Mean rank	Mean values	Sum of ranks
SE_T1 FACTOR SCORE SE	1 INTERVENTION	7	9,14	3,4429	64,00
	2 CONTROL	10	8,90	3,4100	89,00
	Total	17			
SE_T3 FACTOR SCORE SE	1 INTERVENTION	7	10,50	3,6667	63,00
	2 CONTROL	10	7,30	3,4300	73,00
	Total	17			

TABLE 4 | Test statistics table.

	SE_T1 FACTOR SCORE SE	SE_T3 FACTOR SCORE SE
Mann-Whitney U	34,000	18,000
Wilcoxon W	89,000	73,000
Z	-0,098	-1,319
Asymp. Sig. (two-tailed)	0,922	0,187
Exact Sig. [2*(one-tailed Sig.)]	0,962 ^b	0,220 ^b

^bNot corrected for ties.

TABLE 5 | Ranks.

Group		Mean Rank
1 INTERVENTION	SE_T1 FACTOR SCORE SE	1.50
	SE_T2 FACTOR SCORE SE	2.33
	SE_T3 FACTOR SCORE SE	2.17

TABLE 6 | Test statistics.

1 INTERVENTION	N	6
	Chi-Square	2,800
	Df	2
	Asymp. Sig.	0,247

TABLE 7 | Intervention group self-efficacy over Time 1, 2, and 3.

Group		Mean	SD	N
1 INTERVENTION	SE_T1 FACTOR SCORE SE	3,4333	0,39328	6
	SE_T2 FACTOR SCORE SE	3,6000	0,34641	6
	SE_T3 FACTOR SCORE SE	3,6667	0,29439	6

Figure 1 provides a graphical view of the increase in mean values from time 1 to 3 for the Intervention Group. Intervention Group Self-efficacy over Time 1, 2, and 3, displays a graphical view of the immediate change/increase in the intervention groups self-efficacy between time 1 and 2 (time 1 mean = 3,4,333; time 2 mean = 3,6,000). From time 2 to 3, the level of self-efficacy gradually increases/stabilizes (time 2 mean = 3,6,000; time 3 mean = 3,6,667).

Post-hoc Tests for Repeated Measurements in Self-Efficacy (Wilcoxon Signed Rank Test)

The Wilcoxon Signed Rank Test is a statistical evaluation of the mean of two dependent groups. This non-parametric test works with metric data (interval or ratio) that is not multivariate normal, or with ranked/ordinal data (Statistics Solutions, 2019).

In this study, the Wilcoxon Signed Rank test was utilised to measure whether there was statistical significant differences within each group between time 1 and 2 as well as between time 1 and 3. In both, the paired comparisons time 1 was used as the baseline measure reflect changes over time.

Results in **Tables 8, 9** indicate that there was statistically significant differences between the mean ranks for the intervention group between time 1 and 2 ($z = -2,041$, $p = 0.041$) but not between time 1 and time 3 ($z = -0.171$, $p = 0.865$). These results suggest that the intervention had an immediate effect on generalised self-efficacy but not a longer term effect for the intervention group.

Moreover, **Tables 8, 9** indicate that there was no statistically significant difference between the mean ranks for the control group between time 1 and 3. This suggests that there was no longer term effect visible for the control group. The difference over time in self-efficacy scores can be seen graphically in **Figure 2**, where it is evident that for the control group there is relatively little increase in the generalised levels of self-efficacy. However, for the intervention group, there is a relatively strong increase in self-efficacy after the development centre and after 3 months (albeit not statistically significant).

The results largely supported the main research hypothesis that an assessment centre intervention is successful in bringing about a short- and longer term change in generalised self-efficacy. Although the results were not statistically significant, the diverging lines in **Figure 2** largely indicate that the intervention had a pronounced impact on the intervention group when compared to the control group.

DISCUSSION

Background

The aim of the current study was to investigate if development centres can improve the generalised self-efficacy of graduates over the short and longer term. The primary research question was centred on the idea that most graduates struggle to

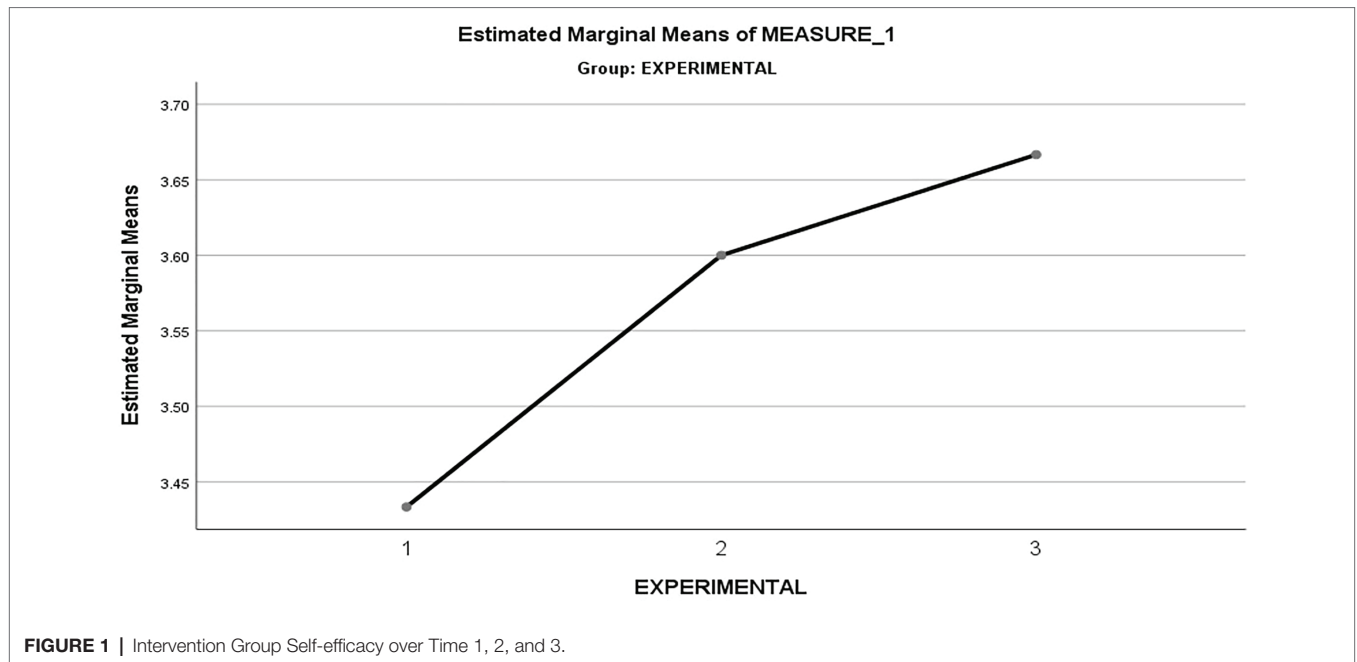


FIGURE 1 | Intervention Group Self-efficacy over Time 1, 2, and 3.

TABLE 8 | Intervention and Control Descriptive Statistics.

Group		N	Mean	SD	Minimum	Maximum
1 INTERVENTION	SE_T1 FACTOR SCORE SE	7	3,4429	0,35989	2,90	4,00
	SE_T2 FACTOR SCORE SE	7	3,6000	0,31623	3,10	4,00
	SE_T3 FACTOR SCORE SE	7	3,6667	0,29439	3,30	3,90
2 CONTROL	SE_T1 FACTOR SCORE SE	10	3,4100	0,44083	2,70	3,90
	SE_T2 FACTOR SCORE SE	0				
	SE_T3 FACTOR SCORE SE	10	3,4300	0,38601	2,90	3,90

TABLE 9 | Intervention and control test statistics.

Group		SE_T2 FACTOR SCORE SE - SE_T1 FACTOR SCORE SE	SE_T3 FACTOR SCORE SE - SE_T1 FACTOR SCORE SE
1 INTERVENTION	Z	-2.041 ^b	-1.261 ^b
	Asymp. Sig. (two-tailed)	0,041	0,207
2 CONTROL	Z		-1.171 ^b
	Asymp. Sig. (two-tailed)		0,865

^bBased on negative ranks.

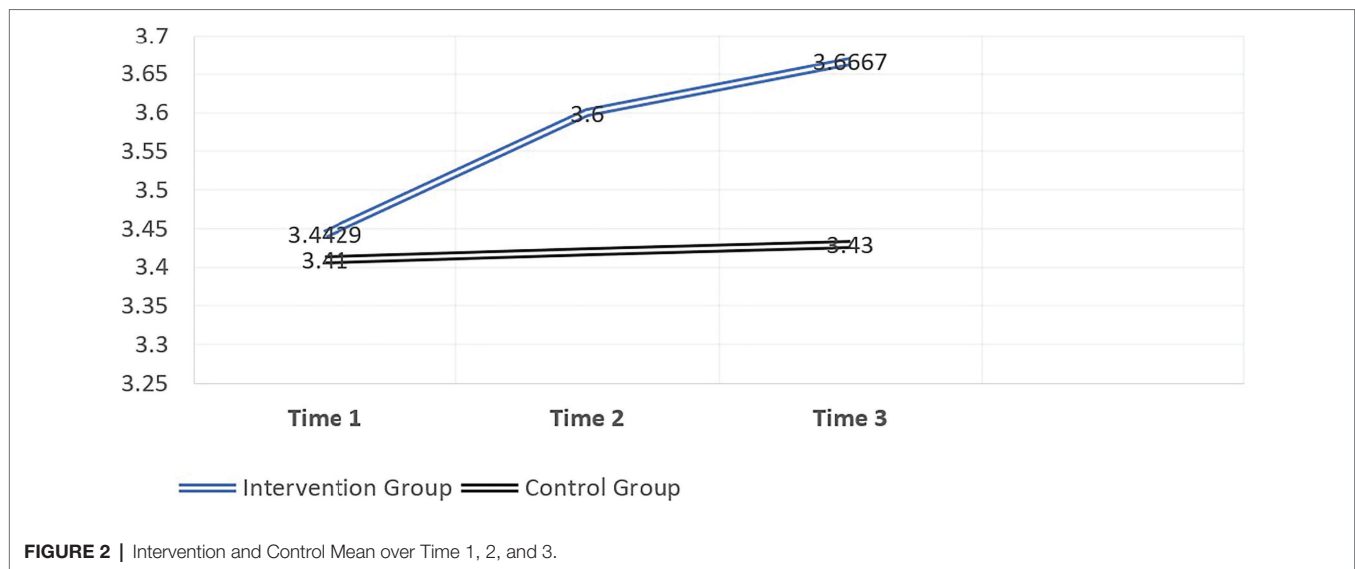
bridge the gap between the theoretical and practical settings. Bridging the gap between tertiary studies and the workplace is critical for the business sector as well as the Higher Education Institutions. Universities aim to produce graduates that can make a material impact in the applied context, while organisations aim to attract the best talent coming out of universities. To this end, the gap between theory and practice remains an inconvenience for organisations and institutions of higher learning.

Discussion of the Findings

The results indicated that the development centre had a practically significant impact on the self-efficacy levels of the intervention group. Moreover, results of the statistical analysis suggest a strong continuous improvement in the generalised self-efficacy of the intervention group over a 3-month period. On the other hand, the self-efficacy levels of the control group had not increased nor decreased throughout the study and stayed fairly stable over the 3-month period. Although the results were not statistically significant, the research shows that the intervention had a definite impact on the intervention group, relative to the control group. This provides promising, though not statistically significant, evidence that development centres have an impact on graduates' generalised self-efficacy levels over the short and long-term. The results are discussed in more detail in the section below.

Hypotheses 1

Hypotheses 1 tested whether the development centre intervention has a short-term effect on generalised self-efficacy levels of graduate students. The results supported



this hypothesis, indicating that the development centre – as an intervention – has an immediate effect on graduate self-efficacy. This comparison was statistically significant, despite the relatively small sample size. The intervention group displayed an immediate positive change in self-efficacy after participating in the development centre. The results seem to suggest that implementing development centres interventions into tertiary higher education institutions and its curriculum can increase perceived generalised self-efficacy in the short term. This study proved that it can benefit graduates by increasing their level of self-insight and self-efficacy levels. Other studies have found development centres to impact participants' self-awareness through performance feedback, outlining essential behaviours critical to their success, and improving graduate academic performance and employability (Sukalova and Hraskova, 2006; Van Wyk and du Toit, 2018).

While assessment interventions pose many benefits, assessment feedback plays an integral part in a student's learning process (Hill and West, 2020). In addition, assessment approaches equip graduates in experiencing real-world training simulations (see, e.g., Stevens et al., 2017). It is evident that development assessment interventions holistically benefit students by improving their technical and interpersonal skills, creating self-awareness, identifying areas of strength and development through feedback and awareness, and preparing them for the world of work through live simulations.

Hypotheses 2

Hypotheses 2 tested whether the development centre intervention has a longer-term effect on generalised self-efficacy levels of graduate students. The results indicate the longer-term effect was not statistically significant, but practical significance indicated there was a consistent increase in self-efficacy from time 1 (pre-test) to time 3 (post 3-month test) for the intervention group. Thus, across all three measurement points, there was

an increase in generalised self-efficacy for the intervention group, but not for the control group. This indicates that the development centre had a promising impact on the short-term and long-term self-efficacy of graduate students.

The results from the study suggest that development centres can play a pivotal role in individual growth and performance of graduates, especially when it comes to self-efficacy. These centres help identify individual strengths and areas of development, determine essential behaviours for current success and future potential, and provide participants with feedback on their performance (Sukalova and Hraskova, 2006; Van Wyk and du Toit, 2018).

While development centres have always been used very effectively in the world of work, Willis (2007, p.32) and Earl (2014) state that these assessments should be assimilated into lectures and classrooms, by providing distinctive links to personal and professional outcomes. One way of achieving this goal would be for universities to start incorporating elements of assessment centres into their teaching pedagogy and curriculum. Moolman (2017) states that it is vital that tertiary institutions constantly build key job requirements into development centre designs to make sure graduates get exposure to on-the-job tasks and activities. When tertiary institutions align their curriculum to the workplace, graduates will integrate into the workforce seamlessly and make an immediate impact in the organisation and wider economy. Managing director of ManpowerGroup South Africa, Lyndy van den Barselaar, posits that investing in the advancement and upkeep of career service centres should be a top priority in South Africa as these centres assist in closing the skill gaps and assist organisations to select the best talent from tertiary training institutions (The Skills Portal, 2018). While investing in development centres may be costly, tertiary institutions should find alternative methods to integrate development centre aspects into their curriculum. Practical examples include providing practical classes, focus groups, online chat groups, career counselling, assessment, and development feedback that aims to enhance graduate employability and self-efficacy.

Although various research studies have looked into graduate employability and development centres, limited research has focused on developing graduate self-efficacy. Employability is when graduates obtain and maintain employment with the appropriate skills and qualities, while continuously developing personally and professionally (Hillage and Pollard, 1998; Bridgstock, 2009). On the other hand, self-efficacy is a broad competency that may help graduates to develop the skills that is needed to stay employable. Recent literature suggests that efficacy is not a trait, but a general capability that evolves over time and experience (Mazaheri and Yazdani, 2016). This tells us that self-efficacy needs to be developed and maintained in order to have a positive impact in one's ability to accomplish tasks and overcome challenges. Moreover, multiple research studies have found self-efficacy as an important graduate attribute across numerous fields of study (Harvey, 2000; Lowden et al., 2011; Morrison, 2014; Gharetepeh et al., 2015). When graduates have a strong sense of self-efficacy, they are able to approach difficult tasks, set stimulating goals and experience lowered levels of stress, depression, and anxiety (Bandura, 1994). Thus, while the right graduate attributes and skills are important to academic and work success, the level of the graduates' self-efficacy in turn determines this success.

Research concurs by stating that an individual's environment is to an extent affected by their judgements of their own abilities (Aghdami Baher et al., 2009). However, despite both tertiary institutions and organisations placing great value on graduate self-efficacy, or at least it is proposed benefits; there has been a lack of effort to develop this attribute. Development centres are one way to have a positive impact on self-efficacy, which assist in gaining insight into the relative strengths and weaknesses of graduates who may be applying for jobs. While development centres focus on improving certain competencies of individuals for specific positions, universities should utilise these centres to develop graduate attributes which in turn develops graduate confidence to overcome future workplace challenges. Developing confident graduates may prove the single most important determinant of graduate success in the workplace. Moreover, it also influences the degree of their effort and perseverance when learning challenging tasks (Lunenborg, 2011). As this study has suggested, development centres positively influence graduates' self-efficacy over the short and medium term. This trend was not found with regards to the control group. This research informs us that development centres have certain additional benefits other than gaining diagnostic information about graduates that may be beneficial for graduates as well as organisations.

Limitations

The major limitation of the study is the relatively small size of the control and intervention groups. Although the statistical analysis suggested that the development centre had an influence on the self-efficacy perceptions of the intervention group, these inferences should be interpreted with caution due to the small sample size. More data need to be collected in future to confirm the pattern of results. Another potential limitation of the study may be the lack of control variables. For example, it cannot be ruled out that the two groups were similar in terms of

achievement motivation. It is well known that achievement motivation can have an impact on test performance which in turn will have an impact on general self-efficacy. Achievement motivation is an internal driving force that is said to impact how an individual performs and achieves a task or expresses an accomplishment (Bao and Zhou, 2017). However, Shokhmgar et al. (2018) state that self-efficacy is in fact a determining element for achievement motivation. Based on various research studies, achievement motivation and self-efficacy seem to correlate when it comes to academic achievement and work performance (Bao and Zhou, 2017; Saeid and Eslamnejad, 2017; Benawa, 2018; Shokhmgar et al., 2018; Saadat et al., 2019).

Another limitation was the raters' level of experience in evaluating participants. Although the raters had gone through extensive frame of reference training with an experienced instructor, for most raters, this was their first time scoring competency-based simulations. Although we acknowledge that the lack of experience may limit their ability to observe, record, classify, and evaluate behaviour, the benefit may be that these raters do not have ingrained bias in their rating process. In a study by Leckie and Baird (2011), it was found that the ratings between experienced and new raters did not on average deviate significantly. Previous research however indicates that experienced raters considered factors that were not in the scoring rubric and this can introduce bias in the ratings. More inexperienced raters tend to depend on the scoring criteria more closely (Cumming, 1990).

Moreover, the study only included data from a single university and a single class of graduate students in the same discipline. Although one would expect the results from the current study to extend to other settings and disciplines, this is an assumption that should best be tested.

Finally, the results on self-efficacy were collected by means of self-report instruments. Self-report measures typically suffer from impression management and faking behaviour – it would be more ideal to consider alternative data collection methods, including observations and online assessments that have validation tests for authentication reasons.

Recommendations and Considerations for Future Research

Based on the findings and discussion, it is evident that development centres have a meaningful and positive impact on increasing graduate self-efficacy. Recommendations to implement development centres at universities should become an essential part of a graduates' journey. It is important to embed some elements of development centres in the classroom experience and assessments to build self-efficacy from the 1st-year level. Problem based learning has been extensively used in universities to promote self-development, mastery and self-efficacy (Demirören et al., 2016; Masitoh and Fitriyani, 2018). Problem based learning is a method of instruction where students learn through a pedagogical process with the focus on problem-solving (Smith and Hung, 2017). This instructional learning approach enhances the students' motivation by obtaining knowledge and assimilating it by utilising practical problem

solving (Wijnia et al., 2011). It is clear that this method of learning contains various design elements that overlap with the development centre approach.

The objective of this study was to ascertain whether development centres develop confident graduate students over the short and long term. However, this study has not thoroughly investigated the mechanisms of how graduate confidence levels increase. Here, the opportunity for further research can be to unpack the means and mechanisms of developed self-efficacy through development centre initiatives. Similarly, control variables such as levels of motivation and work experience should be considered.

Moreover, the consideration of different assessment strategies and methods could be reviewed for future research. This study focused on in-basket assessments and competency-based interviews that had specific competencies related to Industrial Organisational Psychology students. Alternative assessments that are grounded in graduate attributes relevant to the working world should be considered, for example, leaderless groups, case studies, focus groups, and role plays.

In addition to the above, the impact of development centre interventions in graduate careers and work experience should be considered. Graduates who undergo extensive engagement with development centre interventions could be studied. The questions of whether the engagement has resulted in an easier transition from university setting to the working world, whether it positively assisted in career progression, made them more employable, and helped them to develop the essential attributes organisations seek are all aspects that could be investigated.

Conclusion

The objective of this research study was to investigate whether development centres can be used to gain diagnostic information on graduates and improve their general levels of self-efficacy. This study revealed that implementing development centres within universities lead to a positive increase in the generalised self-efficacy levels of graduates. In addition, the findings revealed that development centres have an immediate impact on

generalised levels of self-efficacy, which is maintained over the long-term. Graduate development is essential in building confident individuals to take on various new challenges that the world of work presents. Confident graduates are ultimately more courageous in taking risks and making better decisions, are able to tackle challenges better, set stimulating goals and commit to them, experience lower levels of stress, anxiety, and depression, and put more effort and perseverance into learning challenging tasks. It is clear from the research that developing graduates with a high level of self-efficacy is critical, as the graduates we develop today are the graduates who impact our future.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Humanities and Social Science Research Ethics Committee of the University of the Western Cape – H18/6/26. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MW, JB, and MP contributed equally to the MS and worked on the discussion section. The core of the MS was based on the unpublished thesis of MW. JB did the data analyses and integration while MP formulated the literature review section framing of hypotheses. All correspondence should be directed to JB. All authors contributed to the article and approved the submitted version.

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Engaging a Whole Child, School, and Community Lens in Positive Education to Advance Equity in Schools

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Recent decades of education policy, research, and practice have brought focus on a positive education approach as applied within tiered service delivery frameworks to meet diverse needs of varied intensities. Related, the science of implementation has begun to increase understanding of supports to strengthen use of a positive education approach within tiered service delivery frameworks. To date, the body of work has fostered important shifts in how problems are viewed and addressed using a positive lens, supporting more equitable opportunity in education. To realize the full potential, however, there is a need to integrate theory and science as embedded within a whole child, school, and community lens. We propose that positive education will advance equity when grounded in integrated theory and science across developmental systems theory, prevention science, ecological systems theory, and implementation science. We first provide a brief overview of schools as a context to serve as assets or risks to equity, followed by a discussion of theory and science using a whole child, whole school, and whole community lens. We end with directions for science and practice in advancing a positive education approach.

Keywords: whole child, equity, multi-tiered frameworks, prevention science, developmental systems approach, ecological systems framework, school development program

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INTRODUCTION

Positive education encompasses a broad range of theories and orientations, with common elements including proactive problem-solving, promotion of student well-being, and positive relationships (Halliday et al., 2020). Several examples of positive education initiatives that engage these elements exist in United States schools. Social and emotional learning (SEL) and positive psychology interventions, for example, are strengths-based options with their focus on building resilience, building relationships, and promoting self-regulation (Halliday et al., 2020). In addition, positive behavior interventions and supports (PBIS) may be conceptualized as a positive education approach. PBIS focuses on promoting positive child outcomes through proactive strategies (e.g., behavior-specific praise and positive practice of schoolwide expectations) that are universally available to all children. Another example might be found in positive youth development programs given attention to building positive developmental settings and promotion of well-being (Clonan et al., 2004).

Expanding on the common elements of positive education as offered in these examples, we also view positive education as requiring incorporation of systems thinking to enable a shared purpose

toward well-being promotion. Kern et al. (2020), for example, proposed systems informed positive psychology as a way to expand the reach of positive psychology given the interconnectedness of individuals, others, and the environment and the dynamics between those elements. Perspectives of individuals within the system, who is invited in and who is excluded, how the system adapts over time, and how systems organize to come together are attended to in systems thinking (Kern et al., 2020). It is this sort of interconnectedness, which we propose describing as a whole child, school, and community lens, that is needed to enable positive education to advance equity in schools.

Recent decades have brought policy, research, and practice agendas with focus on a positive education approach as applied within tiered frameworks for organizing and delivering tiered services. Grounded in prevention science, the foundation to tiered frameworks is provision of evidence-based core services to all, with data to drive proactive identification of gaps in expected performance and decisions regarding supplemental supports. Related, the science of implementation has begun to increase our understanding of factors that strengthen effective use of these tiered frameworks. To date, the body of work has fostered important shifts in how problems are viewed and addressed, but the comprehensive integration of a positive education approach within these frameworks has yet to reach full potential in advancing equity in schools.

Actualizing the full potential of positive education to advance equity requires integration of theory and science as embedded within a whole child, school, and community lens. This lens is theory-driven at its foundation, with explicit connection to integration across bodies of literature. In this article, we propose that a positive education approach will advance equity when grounded in integrated theory and science across (a) developmental systems theory, (b) prevention science, (c) ecological systems theory, and (d) implementation science. We start by setting up the need for integrated theory and science with a brief overview of schools as a context to serve as assets or risks to equity. Next, we organize discussion of theory and science within a whole child, whole school, and whole community lens. We begin with the whole child, using developmental systems theory as the predominant focus. We then move to the whole school, with a focus on prevention science and applications in education through multi-tiered systems of support. Finally, we discuss the whole community, using integration of ecological systems theory and implementation science as keys to effective and sustained effort. We then offer directions for science and practice to fully enable a positive education approach to advance equity in schools.

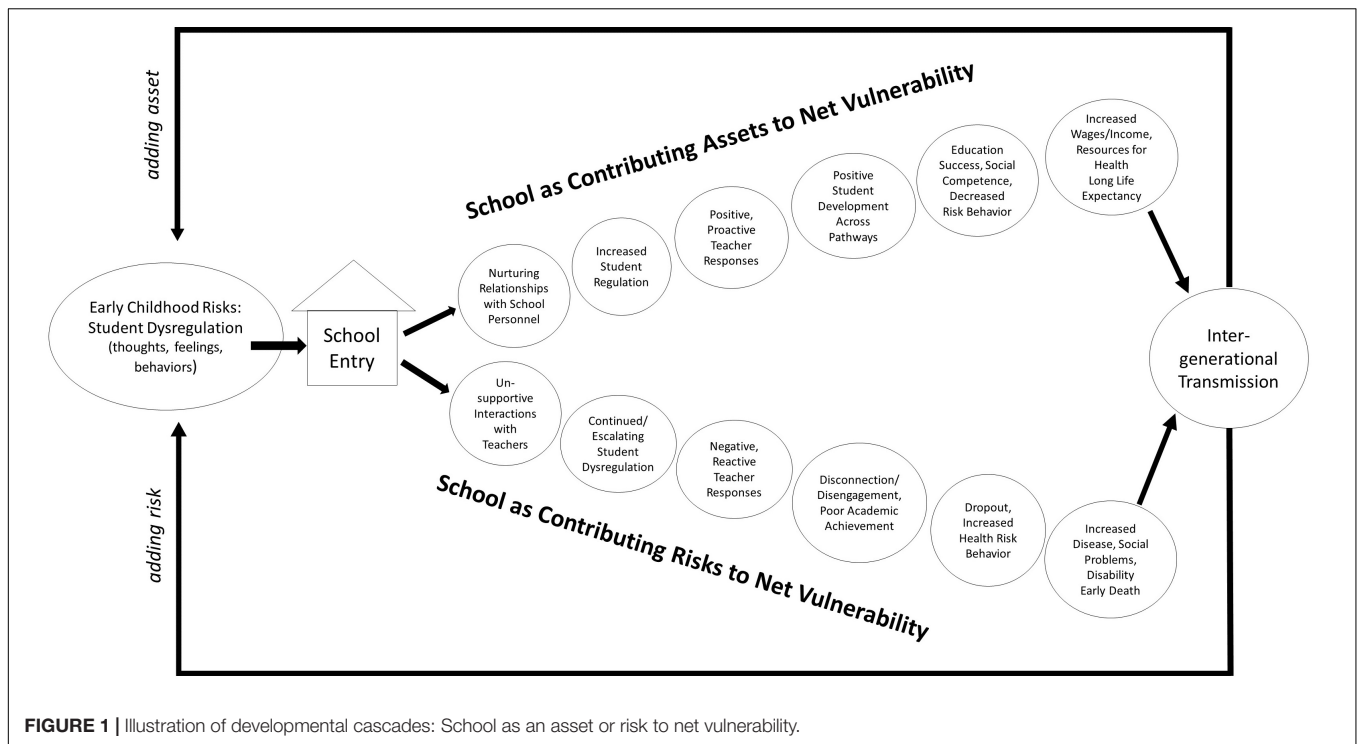
SCHOOLS AS ASSETS OR RISKS TO EQUITY

School is a critical setting for public health intervention, with child development and learning central to closing gaps in education outcomes and reversing negative health outcomes throughout life (Comer et al., 2004; Hahn and Truman, 2015).

Newly released data from the United States Centers for Disease Control and Prevention (CDC)'s Youth Risk Behavior Survey, for example, have noted connections between academic achievement and health behaviors such as sleep, alcohol and tobacco use, physical activity, and nutrition (Centers for Disease Control and Prevention, 2019). In their critique, Hahn and Truman (2015) argue that education is a fundamental social determinant of health, offering grievous illustrations. The authors illustrate that in the United States, for example, a man with a graduate degree could be expected to live 15 years longer than one with a high school education. A dose response appears between years of education and many health-related behaviors – for example, for those with less than 9 years of formal education, there is a higher prevalence of risk behaviors (Hahn and Truman, 2015).

The positioning of school as a public health intervention stems from our understanding of the contributions within and connections across the many contexts that shape a child's development. Within Bronfenbrenner's (1979) ecological framework, school is placed within the system most directly connected to the child, the microsystem, appearing right along with family, peers, neighborhood, and religious institutions. As Osher et al. (2020) noted, school settings have potential to “enhance developmental range, buffer the effects of stress and trauma, promote resilience, and accelerate the development and integration of affective, cognitive, social, and emotional processes (p. 9).” These features in school contexts serve as critical assets to healthy human development, and when available, enable potential for equity in education. When unavailable, the setting features are risks – that is, incongruent with positive, healthy human development given insufficient support and potential mismatch with development or culture. In addition, chronic exposure to these incongruent features in a school context can lead to habituation, thus perpetuating a cascade of negative educational outcomes. In this way, the school context serves as a risk to equity.

When connecting contexts that shape child development, Osher et al. (2020) discuss the goal of minimizing net vulnerability. Positive human development occurs through enabling contexts in ways that minimize risks and maximize assets. As previously noted, schools are an important context to a child's net vulnerability; however, schools contribute to the asset and risk balance of vulnerability in uneven ways across children. In this way, education environments serve as contributors to inequity. Discussion of school as an asset or risk should not be separated from interactions with other contexts, both present and historical. The cumulative consequences of these interactions and transactions within and across systems have been referred to as developmental cascades (e.g., Masten and Cicchetti, 2010). An illustration with focus on school as an intervention for facilitating negative or promoting positive cascades can be found in **Figure 1**. In this example, one path presents school as posing risk, adding to the child's net vulnerability and thus perpetuating inequity that extends intergenerationally. A related example can be found in education policy reform related to school discipline, which was enacted to improve education outcomes yet has resulted in pervasive exclusionary disciplinary practices that not only are disproportionate for certain demographic groups (e.g., students



who are Black, boys, with disabilities) but also disconnected from emerging science about adverse childhood experiences (e.g., Chafouleas et al., 2021).

Attempts to enable the school environment as a contributor to assets (i.e., reduced net vulnerability) exist, yet there is potential missed emphasis on the theory underpinning the what and the why. Although it may be tempting to ask why theory matters if the initiative works, doing so can set up challenges to interpretation of outcomes and perhaps, most importantly, sustainability (Pianta and Walsh, 1998). As one example, we return to discussion of exclusionary discipline as a serious problem, thus prompting a quest for promising alternatives. In a comprehensive review of the literature on alternative options to school discipline, Welsh and Little (2018) summarize the overall body as promising, albeit nascent, yet also potentially problematic given disconnect from theory. Mismatch between theory of action behind alternative options and causes of disparities may be present, particularly regarding opportunity to engage an ecological lens. For example, their review yielded that most alternative options focused on “within” child intervention, such as strategies to assimilate into the school culture. Overall, the various alternatives reviewed tended to focus intervention in a particular area, such as teaching skills to students, restoring relationships after problem behavior, addressing biases and teaching cultural-responsiveness, or restructuring the system. These alternatives each sound promising but may not maximize sustained positive outcomes or implementation.

In their recommended directions for future work, Welsh and Little (2018) suggest that disparities in exclusionary discipline are undertheorized, and they recommend working toward an integrated theoretical framework that expands

upon student problem behavior to also include issues of race and culture in intervention as well as discrimination and bias. We certainly agree, adding that such an integrated framework must also be connected to the science of development and learning to maximize potential for equity in school environments. Integration across theories and science is key to advancing schools as contributing assets to each child’s net vulnerability, which is the foundation for enabling equitable positive education environments.

Next, we expand on our perspective to building and refining an integrated framework to advance equity in positive education as grounded in a whole child, school, and community lens. Integrated theory and science is needed, or in other words, unpacking the “whole” is needed.

WHOLE CHILD: IT’S NOT JUST ACADEMIC

We begin with the whole child as the individual sits at the center of the ecosystem, meaning that the intended outcomes of interventions delivered in any system are ultimately intended to support healthy child development. The big question that drives school-focused intervention, perhaps, is regarding what defines successful child development. The past two decades of education policy reform in the United States defined educational outcomes as driven by academic indicators, with specific focus on increasing achievement for students who are of color, living in poverty, English-language learners, and with disabilities. For example, although policies such as the No Child Left Behind Act of 2001 (Congress.gov, 2001) drew initial praise for calling

attention to “achievement” gaps, the resulting narrow focus on reading and math test scores coupled with punitive school accountability did not yield expected results (e.g., Darling-Hammond, 2007; Darling-Hammond and Cook-Harvey, 2018).

Calls have been made to use the science of development and learning to overhaul school policy and practice toward a whole child lens in education. Although seemingly a recent phenomenon, the roots of a whole child lens were planted over 50 years ago in work seeded by Dr. James Comer. Comer’s school development program (SDP) establishes child development as the cornerstone to learning, with six interacting developmental pathways through which brain maturation occurs (Comer et al., 2004). Comer’s developmental pathway framework includes physical, cognitive, psychological, social, ethical, and language. See **Table 1** for a definition and key features of each of Comer’s developmental pathways, with corresponding alignment of converging descriptions in more recent initiatives such as the ASCD Whole Child Approach (ASCD, n.d.); Learning Policy Institute Whole Child Education (Learning Policy Institute, n.d.); Aspen Institute Commission on Social, Emotional, and Academic Development, 2018; and the University of Connecticut Collaboratory on School and Child Health.

The premise behind a whole child lens is embedded in developmental pathways – in other words, this means enabling every child to reach their full potential by providing appropriate and supportive interactions with adults who help them along their paths and across domains of development.

Comer advocated that school provides a universally accessible setting in which enough adults are available to promote development along all pathways (Comer et al., 2004), thus positioning the mission of education as whole child. The roots to a whole child lens lie within a developmental systems approach. Fueled by trans-disciplinary work (e.g., developmental psychology and molecular biology), a developmental systems approach emerged in the second half of the 20th century. As noted by Molenaar et al. (2013), the overarching assertion is that “developmental processes are explained as the result of self-organizing processes with emergent properties that have complex, dynamic interactions with environmental influences (p. 3).” In other words, a developmental systems approach calls attention to the shared contributions of genes, environment, and epigenetic factors – with research focus on identifying the mechanisms in development.

Moore (2016) elaborates through a comparison of the developmental systems approach and the analysis of behavior. The author shares the limitations of a nature versus nurture perspective given the importance of temporal dynamics, or interactions across factors that form a single complex system, in human development. Importantly, that system is defined not only by the current presentation but through the contributions of historical factors. Past events can contribute to current behaviors, and as such, it is important to recognize historical antecedent factors. Behaviors themselves, however, are heavily influenced by proximate factors and interactions, calling for critical focus

TABLE 1 | Description of Comer’s six developmental pathways, including alignment with other whole child approaches.

UConn collaboratory on school and child health	Learning policy initiative’s whole child education	Aspen Institute Commission on Social, Emotional, and Academic Development (2018)	Comer’s school development program*	
			Pathway	Key features
Physical	Physical health		Physical	Goal: Acquire knowledge about physical development and use it to make decisions that lead to healthy development. Examples include physical health, nutrition, and responsible decision making
Academic	Cognitive development academic development	Academic	Cognitive	Goal: Increase capacity to analyze, synthesize, and evaluate information; achieve mastery in content areas; problem-solve effectively; and enjoy learning. Examples include flexible thinking, skill at manipulating information and the environment
			Language	Goal: Increase capacity for receptive and expressive language, used appropriately across contexts. Examples include interpretation of non-verbal cues, understand spoken and written communication, and effectively use spoken and written communication
Emotional	Mental health social emotional development identity development	Emotional	Psychological	Goal: Develop capacity for self-regulation, management of emotions, and positive sense of self. Examples include self-awareness, self-worth, competence, and emotion regulation
Social		Social	Social	Goal: Build and maintain healthy relationships, across diverse characteristics and settings. Examples include interact well with others and effective communication in relationships
Behavioral			Ethical	Goal: Acquire knowledge of and demonstrate appropriate behaviors, be just and fair, and make decisions that promote well-being of self and others. Examples include respect for rights of others, and integrity of self

*Adapted from Comer (2020) and Comer et al. (2004). The ASCD whole child approach is not mapped here as the description provided is a whole child approach (as opposed to a whole child), which includes ensuring the child is safe, healthy, supported, engaged, and challenged.

on the relationship in order to enable proximate causes of behavior that stem from provision of positive supports that are developmentally and culturally matched.

In their use of a developmental systems lens to present cautions in applying the emerging research on resilience in schools, Pianta and Walsh (1998) borrowed from the metaphor of the branching tree as presented by Sroufe and Rutter (1984). To understand the genesis and routes of adaptation in development, pathways to outcomes can be traced by following ways in which branching occurs. Branches are not supposed to grow evenly across time and can grow in different directions. However, growth is foundationally dependent on nurturing, with provision of early intervention when branches are not taking the desired path.

In human development, nurturing is the developmental relationship. In fact, relationship has been defined as the foremost active ingredient in establishing the positive, supportive contexts across interventions. Li and Julian (2012) operationalized the developmental relationship as “enduring emotional attachment, progressively more complex patterns of joint activity, and a balance of power that gradually shifts from the developed person in favor of the developing person” (p. 157). The authors further argue that the developmental relationship should serve as the foundational metric for evaluating the quality and potential impact of intervention – that is, every program, practice, and policy decision should be evaluated based on facilitators or barriers to developmental relationships.

Returning to the application of developmental pathways within the school context, Pianta and Walsh (1998) shared that:

In our view, a singular focus on success stories, whether they be at the school or individual level is the tendency to overlook the fact that success develops and any effort to promote success by replicating its correlates is likely to fail. It is no accident that Comer’s model for school reform (e.g., Comer, 1996), which has withstood a reasonable amount of scrutiny and replication, is called the “School *Development* Program” (emphasis added) (p. 409).

The authors further note that intervention attempts must start with the understanding that outcomes take time to develop and involve a process of multiple influences that may be potentially uncontrollable. As we discuss later within whole community, desirable conditions for positive and healthy development include strong relationships that enable supportive bonds and interactions among influences.

When disconnected from developmental relationships, trauma-informed schools and SEL are examples of promising education practices that could face challenges to both sustained implementation and outcomes. The past decade has brought a surge in interest to bring the principles of trauma-informed care into school settings (Chafouleas et al., 2021), with the goal of ensuring that all staff are informed about trauma and understand the importance of their role in providing a safe and nurturing environment that avoids re-traumatization. The promise of trauma-informed schools is tightly connected to developmental relationships yet has not always been explicitly front and center in efforts to date. Recent analyses have suggested that the bulk

of existing literature has focused on (a) building staff knowledge about trauma and its impact with less attention to roles in responding to trauma or fostering school environments that avoid perpetuating traumatization, and (b) trauma-specific intervention delivered to students with the goal to reduce trauma symptomology (Chafouleas et al., 2016, 2021; Gherardi et al., 2020). As such, the full promise of a whole child lens in positive education has yet to be fully realized.

The second example, SEL, has brought tremendous effort to restructure what students are taught, moving away from heavy emphasis on academics to include the skills or habits needed to successfully navigate throughout life (e.g., self-awareness, perspective taking, capacity to recognize and regulate emotions, and relationship skills). Again, the promise of SEL is connected to developmental pathways, but it must be made explicit as to how the skills fit within the whole picture of child development. In addition, programs to teach defined social-emotional skills may be well-intentioned, but outcomes may not be realized in the absence of integration of context, culture, and relationships.

Strong potential exists to enhance integration with trauma-informed principles and advance equity through merging of current work in SEL into transformative SEL. Although just beginning to emerge in the literature, transformative SEL connects SEL with salient social identities (e.g., race and culture) and self-concept (Chafouleas et al., 2021). These directions align with implications for schools as identified in a recent meta-analysis on motivation across different academic achievement, well-being, goal orientation, and persistence-related student outcomes (Howard et al., 2021). In brief, the authors recommend school emphasis on autonomy-supported teaching practices, which are congruent with developmental relationships and a positive education approach.

As illustrated in both examples, this new wave of education reform in the United States holds tremendous promise to integrate what often appears as parallel initiatives; however, these efforts must be explicitly connected back to the why of the work, which is founded in a whole child lens. In the absence of a whole child focus, such as when attention is directed toward academic goals or building skills without contextual match, inequity will likely continue as an outcome.

In summary, a developmental systems approach provides a foundation for understanding the what and the why behind a whole child focus in positive education. Efforts such as the Comer SDP have been successful given the placement of relationships and the associated science of development and learning at the center of the work. Picking up on Comer’s position that school is a universally accessible setting to promote development along pathways, strong positive relationships serve among the most critical resources offered in the school environment. Thus, we now turn to review of the whole school, meaning how do we ensure that the structures are in place to establish adult knowledge, skills, and attitudes necessary for supportive connection that assists each child at the most appropriate branches in their developmental pathways. As we argue, the knowledge, skills, and attitudes cannot be considered separately from the systems in which they are expected to be used. Thus, our whole school focus is on the frameworks for organizing the work

of positive education delivery in schools, and supporting adults in actionable work to select, deliver, and evaluate education services that are developmentally and culturally appropriate.

WHOLE SCHOOL: THE PROMISE OF TIERED SYSTEMS

Research over the past several decades have shown that risks and, ultimately, lasting negative outcomes, can be prevented. Progress in this line of research can largely be attributed to the growth of the interdisciplinary field of prevention science. Emerging in the late 1990's through fields such as epidemiology, education, human development, and psychopathology, "[the] overarching framework of prevention science is a public health model for the conduct, design, and sequence of research and intervention strategies," (p. 1, Stormont et al., 2010). Burns (2011) summarized the principles for prevention science originally presented by Coie et al. (1993) to include: addressing the developmental processes that can lead to negative outcomes; addressing predictors of negative outcomes through intervention before they stabilize; prioritizing intervention for individuals at high risk for negative outcomes; and coordinating action across systems and domains of functioning. Typically, a prevention-based model is described as offering universal strategies for all individuals within a particular population regardless of individual risk; targeted strategies which target individuals who may be at risk; and select strategies for high-risk individuals who have detectable signs of challenges. In sum, the premise of prevention science is to systematically mobilize resources, engage measures sensitive to identifying concerns early (e.g., any gap in expected performance), and put in place appropriate services to mitigate those risks (i.e., reduce or eliminate gaps in expected performance).

In K12 education settings in the United States, contemporary application of tiered service delivery is more commonly referred to as multi-tiered systems of support (MTSS). MTSS frameworks have generally been described as having three tiers of service delivery intensity: those focused on all students (Tier 1: preventing challenges before they occur); some students (Tier 2: mitigating challenges for those at risk for or exhibiting early challenges), or a few students (Tier 3: intensive supports to reduce challenges for those who did not respond to Tier 1 or 2 supports). MTSS frameworks offer schools a structure for organizing processes to provide a continuum of supports for students based on identification of a gap between expected performance and actual performance (Lane et al., 2016).

A cornerstone of effective MTSS is not only the availability of a continuum of supports from prevention to intervention, but assessments that focus on identification of who needs which supports and monitoring of responsiveness to the provision of those supports. Thus, a fully functioning MTSS framework includes ongoing links between assessment and intervention. Decisions regarding services are made through data-informed processes to match evidence-based practices to identified needs, whether it be intensive services for an individual, targeted

services for a specific population or need, or services for the entire student body. At the systems-level, implementation data are collected to determine whether initiatives are being delivered as planned. Universal indicators (e.g., screening assessments, attendance, referrals, and grades) are used to identify gaps in performance and provide population surveillance over time, with data examined at regular intervals.

To date, MTSS in schools has historically involved a siloed approach to supporting student needs. In fact, initial applications of MTSS in schools were focused on academic skills, which then extended to support behavior (Walker et al., 1996; Lane et al., 2016). In recognition of the missing support across other areas of student development (e.g., social) and the challenges that arise from siloed academic and behavior tiered systems of support, shifts to comprehensive and integrated tiered systems of support have initiated. Models such as the comprehensive, integrated, three-tiered model of prevention (Ci3T) include tiered academic, behavioral, and social-emotional systems to support students more effectively and efficiently (Lane et al., 2016). As an example, see **Figure 2** for a visual of MTSS that integrates domains of functioning and shares example services across tiers and settings.

Recently, integrated MTSS (I-MTSS) has been conceptualized as a component of promoting social justice, as it can facilitate equitable access to education for students who are often marginalized, such as students with emotional and behavioral disorders (Melloy and Murry, 2019; Chafouleas et al., in press). When done well, an integrated tactic to implementing tiered systems of support is aligned with promoting equity in schools (Melloy and Murry, 2019). Chafouleas et al. (in press) discuss that a key component of MTSS done well is gathering data from a variety of sources (e.g., internal student factors, home variables, and classroom management practices) to aid in effective decision-making around student supports. However, the authors also point out gaps in educator skills related to use of data in decision-making, along with gaps in broader support for data-based decision-making (Chafouleas et al., in press).

As such, we pose the question: are MTSS truly making education more equitable for all students, regardless of ability, race, ethnicity, socioeconomic status, culture, language, etc.? Avant (2016) positioned that MTSS implementation must change to align with a socially just, equitable lens, with proposed changes such as preparing educators' social competence, ensuring curricula and practices address diversity, and establishing a culture of social justice starting with school leaders. We agree, adding that establishing equitable school environments also requires connection with factors beyond the school microsystem. The previously mentioned SDP connects these factors and engages a positive and preventive approach in fostering equitable education environments.

The SDP was first introduced in 1968 by Dr. James Comer. SDP, which is a process for comprehensive school improvement, was developed using principles from public health, social relationship theory, and child development (Comer et al., 2004). SDP theory is congruent with positive education, and SDP practices are aligned with school-based prevention models given emphasis on whole school change, enabling schools to serve as a hub for supporting child development, family involvement

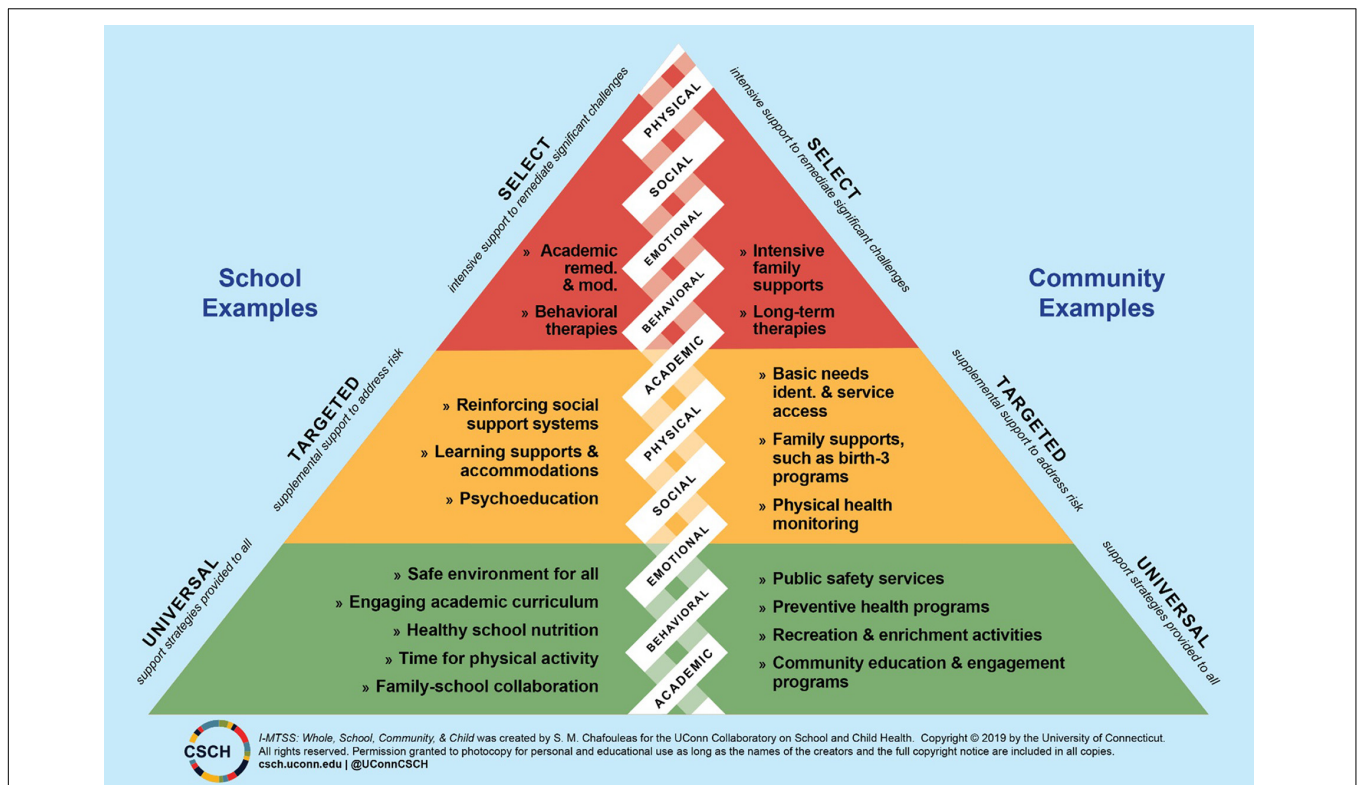


FIGURE 2 | Visual example of multi-tiered systems of support that integrates whole school, community, and child (Chafouleas, 2019). Image reproduced with permission from the Collaboratory on School and Child Health at the University of Connecticut.

in school-based teams and decisions, and ongoing professional learning for teachers and school staff (Comer et al., 2004). The SDP process includes guiding principles, operations, and teams designed to foster a school climate where teachers can teach, and students can learn. Similar to MTSS, the SDP process was not designed to be one more thing for schools to do, but rather to assist schools with better managing, organizing, integrating, and aligning curriculum, instruction, and assessment, and engaging in data-driven decision making to prevent negative outcomes for students through supporting child development, particularly for minoritized youth (Comer et al., 2004). SDP provides a framework for stakeholders to communicate effectively and plan for school improvement through prioritization of prevention efforts.

Parallels exist between MTSS and SDP, including a focus on prevention and meeting diverse student needs through evidence-based strategies and data-driven decision making. However, explicit emphases in the SDP process are tied to the previously described whole child lens. As first promoted in SDP over 50 years ago, evidence for “non-academic” influences such as child self-concept, self-efficacy, teacher-student relationships, and parent involvement with potential to accelerate student achievement continues to grow (Hattie, 2017). Although some MTSS frameworks address these malleable child and environmental factors, they are not typically explicitly woven into MTSS procedures. It is this gap that offers strong potential for positive education to contribute to reducing inequities.

In sum, whole school contributes to the rationale and organizing mechanisms for determining what is needed and for whom. It is important to ask, however, whether current MTSS practices are in fact equitable in the absence of grounding in a whole child lens. To move forward in sustainable effort, integration of the larger ecological context, or the whole community, with whole child and whole school is needed.

WHOLE COMMUNITY: DRIVERS TO SUSTAINABILITY

Whole community acknowledges the need to connect whole child goals across settings and contexts to maximize outcomes and bolster sustainability of efforts. As noted by Kern et al. (2020) in their proposal to apply systems thinking to positive education, intervention targeting one part of a system without consideration of interrelatedness across the entire system has potential to result in unintended consequences. As we outline, positive relationships, including among adults connected to the child, continue to undergird the ultimate success of any initiative, both within and across child-serving systems (family, school, and community). In addition, success is contingent on moving through stages of implementation – again, ensuring that all stakeholder voices are informed and engaged through phases. These conditions are important to enable the current

implementation context, but alone may not be sufficient for sustainability. Thus, in this section, we define whole community as merging ecological systems framework and implementation science to engage cross-ecosystem strategies that can heighten enduring use of a positive education approach.

Throughout the article, we have made nods to the relevance of cross-microsystem collaboration in enabling positive developmental pathways. Comer (2020) emphasizes that whole child work must be contextually driven, that is, co-constructed with all stakeholders and building from strengths in the current context. Drawing from the natural context and employing purposeful programming for generalization can yield better student and implementation outcomes than attempts to import manualized programs into the current environment (Riley-Tillman and Chafouleas, 2003; Clonan et al., 2004).

The Comer SDP principles are based in supportive relationships, which extend beyond child-adult to adult-adult interactions. As aptly stated, “In every interaction you are either building community or breaking community,” (p. 148, Comer et al., 1996). Guiding principles include no-fault (everyone is accountable, focus is on problem-solving over blame), consensus (decision-making to build consensus about what to try), and collaboration (responsiveness by all, from leaders to team members; Comer et al., 2004). Full implementation of SDP is described as a process that occurs over multiple years across phases (pre-orientation, orientation, transition, operationalization, and implementation). In short, SDP brought forth important elements that can be viewed today in contemporary terms used to describe key features to adoption, uptake, and successful implementation of intervention, such as “buy-in,” “phases of implementation,” and “usability.”

School development program has a long history of implementation in schools and districts across the United States. Multiple studies over the past decades have supported significant student outcomes across domains of achievement, behavior, and attitudes. In fact, the Comer SDP process was identified as one of few effective models in a meta-analysis of school reform efforts (Borman et al., 2002). SDP represents an example for which the intervention ingredients for the “secret sauce” are in place for successful outcomes and implementation within the school microsystem. The SDP theory of change positions that SDP facilitates these outcomes by buffering child risk contributed by external factors through direct effects on classroom factors and indirect factors associated with school organization, climate, and culture.

Although the language may not fully align, the work was visionary in setting the stage for the application of implementation science in education innovations. The challenges encountered by SDP and related reform efforts are not about producing expected child outcomes but centered on long-term sustainability of efforts. Factors such as phases of implementation and user-centered design are in place to enable successful implementation within the current context of the microsystem (i.e., school) and interactions among microsystems (i.e., school and family), but there is more to be mapped in theories of change to bolster sustainability. Guidance for these maps to enduring change may be drawn from implementation science frameworks.

As noted by Lyon and Bruns (2019), multiple iterations of implementation frameworks have emerged that have application to school settings, with an important commonality being the need to attend to multiple layers to bolster success. These layers or factors that obstruct or enable change have been described as implementation determinants. Many individual determinants are possible, which can be grouped into categories such as outer setting, inner setting, bridging factors, and the intervention itself – along with acknowledgment of interconnections, interactions, and linkages across the categories (Moullin et al., 2019). The inner setting, for example, refers to the immediate context or school microsystem, and may include factors such as principal leadership; individual teacher interest in, knowledge about, and skill with intervention delivery; resources to support implementation such as time or coaching; and data systems for evaluating decisions. Complete descriptions of each group can be found in Moullin et al. (2019).

Returning to our understanding that implementation occurs in phases, McIntosh et al. (2014) noted that different factors may be more or less important to driving success at different stages of implementation. In their work to understand variables least and most important for initial implementation and sustainability to School-Wide Positive Behavior Supports, some factors such as school administrator support, implementation fidelity, and staff buy-in were indicated as facilitators across stages. In contrast, district-level support was perceived as critical to sustainability, and parent involvement was less critical during initial implementation yet was very important to sustainability.

To date, limited research attention has been directed toward understanding influences of the outer setting, specifically those factors that facilitate sustained implementation. Lyon and Bruns (2019) define the outer setting as “the larger political, social, and economic context in which implementation occurs. This includes norms, laws, and broader policies as well as interorganizational linkages within a larger service system,” (p. 208). In schools, this can mean the district, state, and federal levels. In their discussion of translation and use of evidence in mental health intervention, Atkins et al. (2016) advocate that in order to effectively respond to child vulnerability, dissemination and implementation research agendas must be intentional in aligning with an ecological model. That is, whole community contributions to advancing equity in the school microsystem hinges on building capacity to define determinants across levels in the ecosystem that facilitate sustained implementation over time.

As previously noted, both intended and unintended consequences can result from initiatives put in place at each layer within the ecosystem (Kern et al., 2020). In the example provided by Lyon and Bruns (2019), for example, unfunded or underfunded mandates require shifting and are often put in place without *a priori* consideration as to what resources will be re-allocated away from something else in order to comply with the mandate. In another example, Clonan et al. (2004) remind us that adding classroom activity (e.g., 15 min SEL curriculum) means taking something else away (e.g., reduced time for recess). Given that advance understanding of that impact often is unknown, there is rationale to both modify the natural context to the least extent possible in intervention design as well as establish steps

to evaluate intended and unintended outcomes. Together, both examples illustrate the need to align goals, expected outcomes, and values within and across each system to establish points for synergy in advocacy and commitment to enduring change.

This whole community alignment occurs through integration with whole child and school. The whole child lens gives us child development and learning theory in which to ground the work in a positive education approach. We have learned that sole focus on academics does not get to desired outcomes, yet a pendulum swing to SEL may not yield desired outcomes in the absence of grounding within a whole child lens. In the United States, work to do so is being put forth by groups such as the Center for the Developing Child¹, which uses the science of child development and learning to enable positive developmental cascades (i.e., whole child lens) within a whole community lens as applied to early childhood. Similar directions to ground effort in a whole child lens can be expanded to the K12 public school. The whole school lens identifies school as a critical microsystem for facilitating public health goals in prevention and promotion of desired child and life course outcomes. Whole community is then used to tie together whole child and whole school to advance equitable outcomes for all. For example, see **Figure 2**.

As summarized by Osher et al. (2020), advancing equitable education outcomes requires support and efforts across the general public and political leaders, policy that promotes evidence-based whole child practices, quality implementation, formative assessment to monitor progress, scaled uptake, and explicit goals around equity and cultural competence. As such, there are “provocative opportunities for defining and studying an increasingly intentional constructive enterprise between children, the ecologies in which they grow and learn, and the relationships to the adults and peers in their lives and, by doing so, open pathways for new creative approaches to solving seemingly intractable learning and social problems,” (p. 24, Osher et al., 2020). Given its tenets, positive education has strong potential to contribute to advancing equitable education outcomes when a whole child, school, and community lens is used to advance a comprehensive and integrated positive education approach.

DISCUSSION: MOVING RESEARCH AND PRACTICE FORWARD

In this article, we propose that a positive education approach must be embedded within a whole child, school, and community lens to advance equity in schools. Such an approach is theory-driven with explicit integration across bodies of science. Specifically, we define a whole child, school, and community approach as grounded in integration across (1) developmental systems approach, (2) prevention science, (3) ecological systems framework, and (4) implementation science. For over 50 years, Dr. James Comer has championed nurturing of the whole child through the foundational roles of developmental relationships and no-fault consensus collaboration among adults who care

for them. Comer’s work is tied to the developmental systems approach, and connects to prevention science with emphasis on nurturing development as requiring proactive (versus reactive) service delivery.

In recent decades, prevention science in schools has evolved into multi-tiered systems of service delivery that address targeted domains of functioning (i.e., academic and behavior), perhaps losing focus that whole child success necessitates attention to nurturing of many developmental pathways in different ways across stages of development. The ecological systems framework brings emphasis to interactions within and across systems that influence outcomes across generations. The school system is not alone in contributing to net vulnerability but can serve as a critical asset to child development – yet it has not historically done so for every child. Each child brings forth a unique set of risks and assets, and thus, for schools to contribute to reducing net vulnerability necessitates strong positive relationships with adaptation of services to the individual need. Implementation science bolsters potential capacity for promising practices to contribute assets by maximizing features of usability and sustainability within intended settings. Together, a whole child, school, and community lens sets the stage to enable the full potential of a positive education approach to advance equity in schools.

In recent reflections on his personal experiences and history of the SDP, Comer (2020) notes that

...many schools, through no fault of their own, are not prepared to adequately promote [student] development and learning. The school challenge exists, in part, because knowledge regarding how to intentionally design, organize, and manage schools in ways that support student’s development, learning, and increased opportunity for life success is not adequately understood and embedded in the adult population (p. 43).

This next generation of positive education research and practice can advance the foundations built by Comer to enable a sustained whole child, school, and community lens that puts equity at the center of the work, disrupting the history of school as contributing to negative developmental cascades. Education training, practice, and research has long-embraced the multi-faceted and often complex array of factors contributing to child well-being, and now is the time to advance equity through elevation of the what and why in comprehensive and integrated services to enable sustained impact. Positive education should not be relegated to a surface level program geared to fix an immediate need; efforts must be steeped in integrated science and theory directed toward long-term sustained outcomes.

Much of the groundwork in positive education has been laid, and our next phase in science and practice can be used to fulfill the vision that every child has access to supports that are developmentally and culturally appropriate. When we frame equity as the overarching mission to a positive education approach, the activities of school are embedded in a whole child lens which emphasizes developmental relationships, and service delivery is driven by a prevention orientation and informed through the science of implementation to bolster sustainability.

¹<https://developingchild.harvard.edu/>

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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Academic Well-Being in Higher Education: A Cross-Country Analysis of the Relationship Between Perceptions of Instruction and Academic Well-Being

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The purpose of this research was to explore the relationship between university students' perceptions of the overall quality of instruction (PQI) they experienced since COVID-19 and their academic well-being. This relationship was examined in the context of a moderated moderation with students' household income and the cultural value of power distance (PD), which measures the extent to which less powerful members of an organization expect and accept that power is unequally distributed. Two countries with societally moderate levels of PD (South Africa and the United States) were assessed. Moderated moderations between PQI, income, and PD were found for the academic well-being of students from both the United States and South Africa. The patterns of interactions were in some ways similar and other ways different, highlighting the complexity of how students may react to potential stressors in their academic environment. Potential explanations and implications of these results are discussed.

Keywords: academic well-being, power distance, quality of instruction, income, cultural values

INTRODUCTION

In recent years, there has been a growing emphasis on student well-being as an important educational outcome (Govorova et al., 2020). Since COVID-19, well-being has become even more of a concern due to the academic, financial, and health stressors that arose during the pandemic. Well-being has been described as a dynamic state encompassing the potential to achieve one's personal and social goals (Borgonovi and Pál, 2016) and is associated with students' academic performance across countries (Govorova et al., 2020). Relatedly, academic well-being encompasses factors that contribute to doing well academically, such as academic achievement, academic stress, and academic satisfaction (Shek and Chai, 2020). General and academic well-being have been associated with positive outcomes for students (Robinson and Snipes, 2009; Korhonen et al., 2014; Shek and Chai, 2020), and both may have been negatively affected due to the changes and challenges to university life during COVID-19.

One considerable change to university life was a rapid transition from in-person to online learning modalities; research with students in higher education worldwide found that 87% experienced such a transition (Aristovnik et al., 2020). This often resulted in alterations to

course materials and the type of instruction students received (e.g., from in-person instruction to a more remote and/or asynchronous instruction). Students have reported varying degrees of dissatisfaction about these changes (Aristovnik et al., 2020; Means and Neisler, 2020; Qazi et al., 2020). The purpose of this research was to explore the relationship between university students' perceptions of the overall quality of instruction (PQI) they experienced since COVID-19 and their academic well-being. Two interacting moderators were assessed within the context of this relationship: household income and the cultural value of power distance (PD). These moderators were chosen as they represent two important constructs that often influence students' academic experiences in educational settings. Two countries with societally moderate levels of PD (South Africa and the United States) were assessed.

Academic Well-Being

In many fields, it is now essential to earn a university degree to practice professionally (e.g., health, law, engineering, education). A university degree is associated with a variety of positive outcomes including better health and healthcare, more employment security, and a higher salary when compared to people without degrees (Ma et al., 2016). For these reasons, it is important that students persist in their studies until they graduate. One precursor to students' degree persistence is their academic well-being, which includes thoughts and behaviors that contribute to doing well in school, like achievement, academic satisfaction, and stress (Shek and Chai, 2020). In diverse samples, high academic well-being has been associated with lower rates of dropout (Korhonen et al., 2014), and with hope, optimism, self-efficacy (Robinson and Snipes, 2009), as well as with positive youth development (Shek and Chai, 2020).

COVID-19 may have negatively impacted students' academic well-being. Because of the global pandemic and subsequent social distancing, many students were no longer permitted to attend class in person, were required to move out of dorms, lost jobs, and experienced anxiety about their own and loved ones' health. In addition to the social and financial losses experienced, students may also have experienced "academic loss" because of the expeditious changes to their courses as online learning became a necessity rather than a choice. If students wanted to continue their studies, they had to take their courses online (Aristovnik et al., 2020).

Online learning is a format with which students are often ambivalent. On the one hand, online classes offer flexibility and can be more accessible to those with work and family responsibilities or who live in remote locations (Murphy, 2020); conversely, online courses require independent learning which can make engaging with the content more challenging, can eliminate the sense of community in the classroom (Song et al., 2004), and can subsequently lead to higher rates of course withdrawal (Frydenberg, 2007). Taken together, there are many potential issues that can arise when taking online courses in higher education; consequently, students' academic well-being may have been negatively impacted by the worldwide transition to this learning modality during COVID-19.

Quality of Instruction

Sogunro (2017) stated that quality of instruction was the "raison d'être" university students provided as a source of motivation in their studies. One motivator is the passion that instructors feel for topics, which can be contagious, with students likewise developing passion for the topics they are learning (Schunk et al., 2008). Another reason is that knowledgeable instructors choose and create appropriate materials to promote discussions, critical thinking, and learning. A third reason is that effective, high-quality instruction involves the dynamic delivery of the content (Sogunro, 2017), which can create an engaging learning environment.

Arguably, all instructors want to provide high-quality instruction. However, the quick transition to online courses due to COVID-19 created a unique situation that left many instructors unprepared, sometimes with little assistance for course design and technical support, and little time to ensure that altered course materials were of high quality and met the learning needs of students (O'Keefe et al., 2020). Research with students in higher education found that, since the onset of the pandemic and its accompanying changes to classes, 31% of students in the United States (Means and Neisler, 2020) reported moderate to strong dissatisfaction with the quality of instruction and students within Africa reported the lowest overall satisfaction with their instruction since the pandemic, when compared to students on other continents (Aristovnik et al., 2020). In addition to dissatisfaction with instruction, students have reported increased stress, an inability to focus, with some reporting that their online classes were no longer their priority (Herold and Chen, 2021).

Income

One variable that might moderate the relationship between students' PQI and academic well-being is their income, particularly when considering the evidence that worldwide, university students from low-income backgrounds experienced significantly more challenges, both academic and personal, than their more affluent peers during the COVID-19 pandemic. In the United States, low-income students reported less access to the internet and were more likely to drop courses because of low grades that could result in being ineligible for future financial assistance for their classes (Rodríguez-Planas, 2020). Personal challenges included more childcare responsibility, greater probability for illness and stress, housing challenges, and job loss (Rodríguez-Planas, 2020). Even in pre-pandemic times, the academic challenges faced by low-income South African students were many and varied, including the costs of housing, food, books, student fees, transportation costs, and sometimes a pressure to use their bursaries to provide their families with financial assistance (Mngomezulu et al., 2017). During COVID-19, many South African households lacked internet access (as Wi-Fi is restricted and data costs are high), computers, and consistent electricity due to a relatively common occurrence of load shedding (Dube, 2020). Because of these myriad challenges, students from low-income households worldwide likely experienced more difficulties, both academic

and social, during COVID-19 and this may have impacted their academic well-being.

Power Distance

Culture is the “software of the mind” (Hofstede, 2001), including the collective beliefs and values of a group (Triandis, 1996) and has been suggested to be a vital moderator when understanding how people perceive and respond to their experiences (Li et al., 2019). Hofstede’s Cultural Dimensions Theory (Hofstede et al., 2010) is a paradigm that describes six cultural values (power distance, indulgence, masculinity, individualism, long-term orientation, uncertainty avoidance) and the degree to which various countries hold these values. In this research, the cultural value of power distance (PD) was the focus. PD involves the degree to which individuals, societies, and nations accept social inequality as a natural occurrence (Hofstede, 2001). In educational research, PD has been suggested to be a key cultural value because of the inherent status hierarchies between student and instructor (Cortina et al., 2017).

In societies that score high on PD, there is deference to those in high status positions, whereas low-scoring societies view leaders and their subordinates more equally. However, PD can vary between people within societies; therefore, societal scores should not be applied to individuals. For example, a review of the literature on PD and well-being concluded that while PD negatively predicted the subjective well-being of countries, it positively related to individual-level outcomes, like work satisfaction (Daniels and Greguras, 2014).

On the individual-level, PD has been found to moderate the relationship between income inequality and subjective well-being (Li et al., 2019). PD may interact with income because it affects how people view inequality situations; for example, in school settings, high PD students may expect and accept that instructors have more power in the course dynamic. Therefore, students who are low-income and high PD may be more tolerant of low PQI than those who are low-income and low PD, who are less accepting of power differentials. Acceptance of inequality may, in turn, associate with higher well-being.

Research has found that students with high PD values view their instructors as knowledgeable, higher status, and less approachable when compared to students with lower PD values (Hwang and Francesco, 2010). In an online learning setting, students with high PD values were found to expect a strong instructor presence on the discussion board to guide discussions and indicate whose posts were correct and whose were not (Zhang, 2013). Conversely, in educational institutions with lower PD values and more egalitarian relationships among students and instructors, students reported high feelings of belongingness (Cortina et al., 2017).

PD has been previously conceptualized as a moderating variable with the outcome of well-being. In research about workplace relationships between managers and their subordinates, PD was found to moderate the relationship between abusive supervision by managers and employee well-being, where high PD acted as a protective buffer against manager negativity (Lin et al., 2013). In the workplace context,

those high in PD were accepting of the imbalance of power and therefore viewed the abusive supervision as irrelevant to their well-being (Lin et al., 2013). Other scholars have likewise indicated that PD is an important moderator in the relationship between unfairness and justice because those high in PD are more accepting of inequality (Daniels and Greguras, 2014).

In this research with a focus on the academic context, PD was conceptualized as a moderator of income, whereas income was conceptualized as a moderator in the relationship between PQI and academic well-being. It was expected that the relationship between students’ PQI and academic well-being would depend on income, which would then depend on PD.

Purpose

Academic well-being is an important precursor to students’ persistence in earning their degrees but may have been negatively affected during COVID-19. The purpose of this research was to examine students’ PQI and its effect on well-being, which was hypothesized to be moderated by income, which itself was hypothesized to be dependent on PD. This is termed a “moderated moderation” but is more widely known as a three-way interaction (Hayes, 2018).

The premise is that students have different expectations for what their school experiences should be like; students who have their expectations met or exceeded will have higher academic well-being than those who do not have their expectations met. Receiving high-quality instruction is one important academic expectation that students hold; however, its effect on well-being could depend on income: students from low-income backgrounds might feel they are wasting limited resources on their classes due to low PQI, which would lead to even lower well-being than low PQI would for a student who has more resources. Moreover, the income differences in the link between PQI and well-being may be PD dependent; for example, the income differences that moderate the PQI–academic well-being link could be smaller among those with high PD than low PD because high PD can serve as a buffer for well-being in inequality situations.

With moderation analyses, interaction effects are first assessed. If a significant interaction is found, then the main effects should not be interpreted, as the effect of one variable depends on—or moderates—another. Because of this, the highest order three-way interaction was first hypothesized. If found to be statistically significant, then the remaining hypotheses for that country were disregarded because lower-order effects should not be interpreted. If the three-way interaction was found to be non-significant, then the two-way interactions would be analyzed for that country. Similarly, if a two-way interaction was found, then the main effects involving those variables should not be interpreted.

The specific hypotheses were as follows:

H1: The relationship between PQI and academic well-being will be moderated by income, which will be moderated by PD for students in the United States (H1a) and South Africa (H1b).

H2: If H1 is unsupported, there will be a two-way interaction, where:

- There will be a relationship between PQI and well-being, moderated by income for students in the United States (H2a) and South Africa (H2b).
- There will be a relationship between PQI and well-being, moderated by PD for students in the United States (H2c) and South Africa (H2d).
- There will be a relationship between income and well-being, moderated by PD for students in the United States (H2e) and South Africa (H2f).

H3: If H2 is unsupported, there will be main effects, where:

- There will be a main effect of PD on well-being for students in the United States (H3a) and South Africa (H3b).
- There will be a main effect of PQI on well-being for students in the United States (H3c) and South Africa (H3d).
- There will be a main effect of income on well-being for students in the United States (H3e) and South Africa (H3f).

MATERIALS AND METHODS

Participants

United States

Data were collected at two universities in the southwestern United States. Undergraduate students enrolled in psychology classes had a range of research studies in which they could participate. If they chose to participate in this online study, they signed into the study and were brought to an online data collection program. There were $n=896$ participants whose data were used for the moderation analysis, but some were missing data on their demographics. The age data (total $n=889$) indicated participants ranged from 17 to 56 ($M=19.01$, $SD=2.32$) and reported their gender (total $n=896$) as $n=153$ males, $n=731$ females, $n=5$ transgender, $n=5$ “other,” and $n=2$ prefer not to disclose. Annual family income (total $n=896$) was reported to be \$50,000USD or below by $n=339$ participants, and the remaining $n=557$ participants reported family incomes from \$50,001USD and above.

South Africa

Data were collected from a large university in the Gauteng province. Permission from the Registrar was first granted to conduct the study. Following that, the Deans at five faculties were contacted to obtain permission to correspond with heads of individual departments. The heads of department were contacted, and they then shared the information letter about the research with a link to complete the survey with staff. Staff subsequently sent the link and information letter about the research to students.

A total of $n=181$ participants’ data were used for the moderation analyses, but some were missing data for demographics. For age ($n=180$), the data ranged from 18–42 ($M=21.74$, $SD=3.54$). Gender ($n=181$) was reported as $n=43$ males, $n=135$ females, $n=1$ transgender, and $n=2$ reported

“other.” Annual family income ($n=181$) was reported to be around R705,500 (approximately \$50,000USD) or below for $n=102$ participants and the remaining $n=79$ participants reported annual family income of R705,501 (approximately \$50,001USD) or above.

Materials

CVScale

The CVScale is a measure of Hofstede’s Cultural Value Theory (Hofstede et al., 2010) on the level of the individual rather than the level of society (Yoo et al., 2011). The Power Distance (PD) subscale was used for this research. It utilizes 5 items, such as, “People in higher positions should avoid social interaction with people in lower positions” that were measured on a 5-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated more PD. For the PD subscale, the alpha coefficients were $\alpha=0.86$ for United States and $\alpha=0.84$ for South Africa.

Perceptions of Academic Stress Scale

To measure academic well-being, the first 5 items on the Perceptions of Academic Stress Scale (PASS) were used (Bedewy and Gabriel, 2015). The PASS is an 18-item measure that uses a Likert scale from 1 to 5 (1 = strongly disagree; 5 = strongly agree). The first 5 items on the scale are positively worded and ask questions like, “I am confident that I will be a successful student” and “I make academic decisions easily.” Confirmatory factor analyses revealed marginal fit [CFI = 0.897, RMSEA = 0.119, $\chi^2(10) = 166.090$, $p < 0.01$]. Dropping the 5th item significantly improved model fit [CFI = 0.959, RMSEA = 0.110, $\chi^2(4) = 57.759$, $p < 0.01$] and so the first 4 items were used as a measure of academic well-being. Reliability estimates were United States $\alpha = 0.76$ and South Africa $\alpha = 0.68$.

Perceived Quality of Instruction

PQI since COVID-19 was assessed with one item measured on a 7-point Likert scale (1 = extremely low to 7 = extremely high). The question asked: “How would you rate the overall quality of instruction in your classes since COVID-19?” As can be seen in **Table 1**, the means for both the United States and South Africa are around the midpoint of the scale, which is similar to what other recent research has found on student course satisfaction since the pandemic (e.g., Means and Neisler, 2020).

Annual Income

To measure income, participants were asked, “What is your annual household income? Please report your parental income if you are a dependent.” Participants were provided options from 1 (lowest income category) to 9 (highest income category). In the United States, the categories ranged from 1: \$30,000USD and below to 9: \$100,000USD and above. In South Africa, the categories ranged from 1: R423,300 (app. \$30,000USD) and below to 9: R1,410,001 (app. \$100,000USD) and above.

Procedure

The IRB at the principal investigator’s home university approved the research and it was then approved by the other participating

TABLE 1 | Mean, standard deviation, and range for summary scores between countries.

Variable	Country	Mean	SD	Range
Academic Well-being Summary Score	United States (<i>n</i> =896)	2.13	0.76	1–5
	South Africa (<i>n</i> =181)	2.11	0.72	1–4.25
Power Distance Summary Score	United States (<i>n</i> =896)	1.85	0.91	1–5
	South Africa (<i>n</i> =181)	1.89	0.93	1–5
Quality of Classes Score	United States (<i>n</i> =896)	4.29	1.45	1–7
	South Africa (<i>n</i> =181)	4.77	1.49	1–7
Income	United States (<i>n</i> =896)	5.02	3.01	1–9
	South Africa (<i>n</i> =181)	3.54	2.54	1–9

universities' ethics boards. The data were collected from May 2020–December 2020 using an online data collection tool. If students agreed to participate, they clicked a link and were redirected to the anonymous survey where they were first provided with an informed consent that explained the purpose of the study, participation was voluntary, and they could withdraw from the study at any time without penalty.

DATA ANALYSIS

SPSS and Amos Version 27 were used to analyze the data. The data were first analyzed for missing values and whether the patterns of missing data were completely at random. Little's (1988) MCAR analyses indicated that the missing data were completely at random in the United States $\chi^2(3)=2.13$, $p=0.55$ and in South Africa, $\chi^2(5)=3.77$, $p=0.58$. Since the data were missing completely at random, the defaults for missing data were used: AMOS utilized Full Information Maximum Likelihood and SPSS PROCESS used listwise deletion.

Measurement invariance was analyzed using multi-group confirmatory factor analyses (CFA). These CFA analyses assess whether the scales are measuring the same phenomena across countries (Lee, 2018). Often the criteria for full measurement invariance are not reached, but partial measurement invariance can still be found by releasing the constraints on some item and/or intercept loadings. If the Chi-squared difference between the constrained and unconstrained scalar invariance models is not statistically significant, then group comparisons can be made (de Schoot et al., 2012). Full metric and scalar invariance were established for the Power Distance subscale and full metric and partial scalar invariance were established for the Perceptions of Academic Stress (PAS) subscale. Partial scalar invariance for the PAS was reached by un-constraining the intercepts for items 3 and 4 across groups (see **Table 2** for model fit indices).

Next, the moderation hypotheses were assessed with the PROCESS macro-model 3 in SPSS, where there are two interacting moderators (Hayes, 2018). The items on the subscales for academic well-being and PD were averaged to create summary scores. The descriptive statistics by country for the measured variables can be found in **Table 1** and the results of the moderation analyses are in **Table 3**. **Figure 1** shows the hypothesized model to be tested for H1a and b, and **Figure 2** illustrates the model for H2a and b, **Figure 3** for H2c and d, and **Figure 4** for H2e and f.

RESULTS

United States

For students in the United States, a statistically significant three-way interaction was found between PQI, income, and PD on academic well-being ($b=0.02$, $SE=0.01$, $p<0.01$, 95% CI: 0.01–0.03; see **Figure 2**). This confirmed H1a. The unstandardized simple slope for income and PD, both one standard deviation below the mean, evinced a stronger effect ($b=0.25$, $SE=0.03$, $p<0.00$, 95%CI: 0.19–0.31), than the simple slope for students with low income and PD at the mean ($b=0.19$, $SE=0.02$, $p<0.00$, 95%CI: 0.14–0.23), and PD one standard deviation above the mean ($b=0.12$, $SE=0.03$, $p<0.00$, 95%CI: 0.06–0.18). The unstandardized simple slopes for moderate income and differing levels of PD were all relatively similar ($b=0.18$ –0.20, all $p<0.00$). In contrast to low-income and middle-income students, the strongest effect for students with income one standard deviation above the mean was for high PD ($b=0.23$, $SE=0.04$, $p<0.00$, 95%CI: 0.15–0.30) and weakest for low PD ($b=0.15$, $SE=0.03$, $p<0.00$, 95%CI: 0.08–0.21).

South Africa

For students in South Africa, a statistically significant three-way interaction was found between PQI, income, and PD on academic well-being ($b=0.04$, $SE=0.02$, $p<0.05$, 95% CI: 0.00–0.07; see **Figure 3**). This confirmed H1b. The unstandardized simple slopes for income and PD, for low-income students were all similar: one standard deviation below the mean for PD ($b=0.18$, $SE=0.08$, $p<0.05$, 95%CI: 0.04–0.34), the mean for PD ($b=0.18$, $SE=0.05$, $p<0.00$, 95%CI: 0.07–0.28), and one standard deviation above the mean for PD ($b=0.16$, $SE=0.07$, $p<0.05$, 95%CI: 0.03–0.29). The unstandardized simple slope for moderate income and low PD was non-significant ($b=0.02$, $SE=0.05$, $p=0.62$, 95%CI: –0.08–0.13), but was significant at moderate PD ($b=0.09$, $SE=0.04$, $p<0.01$, 95%CI: 0.02–0.16) and high PD ($b=0.16$, $SE=0.05$, $p<0.01$, 95%CI: 0.06–0.27). For high income students, the slope one standard deviation below the mean of PD was negative ($b=-0.14$, $SE=0.07$, $p<0.00$, 95%CI: –0.28–0.00) and was non-significant at the mean of PD ($b=0.01$, $SE=0.05$, $p=0.80$, 95%CI: –0.08–0.11), and one standard deviation above the mean of PD ($b=0.17$, $SE=0.09$, $p=0.053$, 95%CI: –0.00–0.34).

DISCUSSION

There were many negative consequences of the pandemic for some students in higher education. Considering the myriad

TABLE 2 | Fit indices for models of measurement invariance.

Model	Overall models				Nested models (M2 compared to M1)				
	$\chi^2(df)$	<i>p</i>	CFI	RMSEA	$\Delta\chi^2(df)$	Sig.	Δp	ΔCFI	$\Delta RMSEA$
Power Distance Subscale									
M1: Configural invariance	38.170(10)	0.00	0.988	0.051	–	–	–	–	–
M2: Metric invariance (Item 1 constrained to 1 across groups)	40.955(14)	0.00	0.989	0.042	2.786(4)	No	0.594	0.001	0.009
M3: Scalar invariance	48.005(19)	0.00	0.988	0.037	9.886(9)	No	0.360	0.000	0.014
Perceptions of Academic Stress Scale (Items 1–4)									
M1: Configural invariance	57.759(4)	0.00	0.959	0.110	–	–	–	–	–
M2: Metric invariance (Item 1 constrained to 1 across groups)	62.885(7)	0.00	0.957	0.085	5.127(3)	No	0.163	0.002	0.025
M3: Partial scalar invariance (Intercepts 3 and 4 unconstrained across groups)	68.008(9)	0.00	0.955	0.077	10.249(5)	No	0.068	0.004	0.033

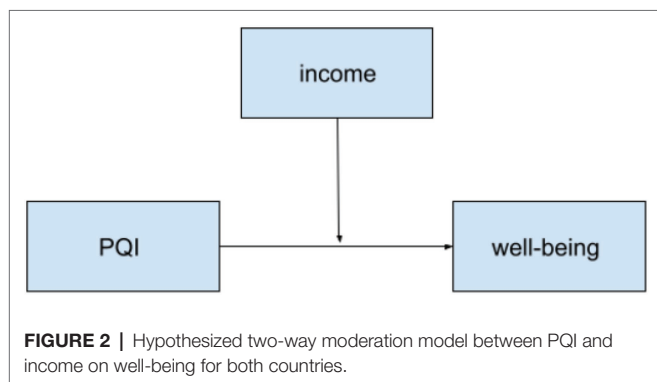
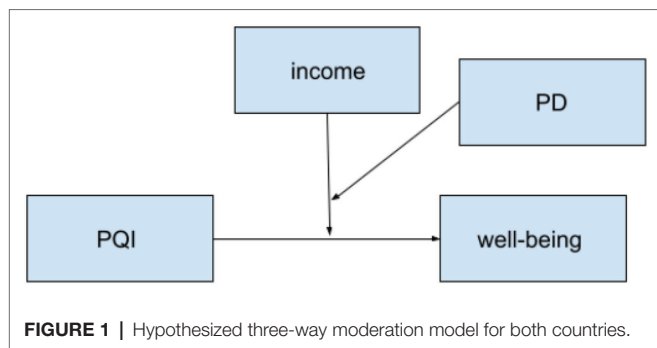
TABLE 3 | Moderation analyses for quality of instruction, power distance, and income on students' well-being.

Effect	<i>b</i>	<i>SE</i>	95% CI		<i>p</i>
United States	<i>R</i>² = 0.15		LL	UL	
Intercept	1.80	0.32	1.17	2.42	0.00
Quality	0.40	0.07	0.27	0.54	0.00
Income	0.22	0.06	0.10	0.34	0.00
Quality × Income	–0.04	0.01	–0.06	–0.01	0.00
Power distance (PD)	0.63	0.15	0.33	0.93	0.00
Quality × PD	–0.11	0.03	–0.18	–0.05	0.00
Income × PD	–0.11	0.03	–0.17	–0.05	0.00
Quality × Income × PD	0.02	0.01	0.01	0.03	0.00
South Africa	<i>R</i>² = 0.10		LL	UL	
Intercept	2.54	0.75	1.05	4.02	0.00
Quality	0.31	0.15	0.01	0.60	0.04
Income	0.46	0.18	0.10	0.82	0.01
Quality × Income	–0.10	0.04	–0.18	–0.03	0.01
Power distance (PD)	0.14	0.33	–0.52	0.80	0.68
Quality × PD	–0.05	0.07	–0.19	0.08	0.45
Income × PD	–0.15	0.09	–0.32	0.02	0.08
Quality × Income × PD	0.04	0.02	0.00	0.07	0.05

stressors that students have experienced during the rapid transition to online courses, significant concern about their academic well-being arose. The purpose of this research was to examine how students' PQI influenced their academic well-being and whether this relationship was moderated by students' household income, which was itself moderated by their PD values. To this end, university students from two societally moderate PD countries (i.e., South Africa, United States) were assessed.

Three-way interactions between PQI, income, and PD were found for the academic well-being of students from both the

United States and South Africa, confirming H1a and b. Illustrated in **Figures 5, 6**, distinct patterns of interactions for the students in these countries were evident. If perceptions of instruction were high, students from the United States exhibited equivalent academic well-being regardless of income and PD. When PQI was low, the results diverged for low- and high-income students. Students with low-income and high PD reported higher academic well-being than when low-income and low PD. As previously suggested (e.g., Lin et al., 2013; Daniels and Greguras, 2014; Li et al., 2019), high PD may act as a buffer against potentially



unjust circumstances because people who adhere to beliefs about the need for social hierarchy are more likely to acquiesce to inequality situations, which associates with higher well-being. This may be particularly salient for students in the United States with low income, potentially with limited resources, and who perceive low PQI.

In contrast, when students were high-income and experienced low PQI, those with lower PD had higher academic well-being than those with higher PD. A similar finding was found for high-income, low PD South African students. Perhaps students with low PQI and high income were making downward social comparisons with their less economically fortunate peers, a phenomenon that has been found to enhance the well-being of people in the United States (Vogel et al., 2014) and middle-income countries (Antinyan, 2016). Seeing how their peers and instructors were struggling during the pandemic, they were more accepting of the low PQI and viewed it as irrelevant to their academic well-being.

Unlike students from the United States, the results diverged for high-income South African students when PQI was high: Students with higher PD had higher well-being than those with lower PD. It is reasonable to assume that high-income students with high PD had high expectations for PQI, and when it was met, these students reported high academic well-being. Why those low in PD would have such low well-being is more perplexing. It could be that high-income students who are low in PD, but high in PQI may have been particularly affected by the academic and social losses that were caused by the rapid transition to remote instruction during

COVID-19. High-income South African students may be particularly accustomed to some of the perks of being at university because they experience fewer financial stressors than their less affluent peers. Though their instructors, who they viewed as relatively equal to them on the social hierarchy, were perceived as providing high quality instruction, this did not compensate for the numerous other academic and social losses that they experienced which negatively influenced their academic well-being.

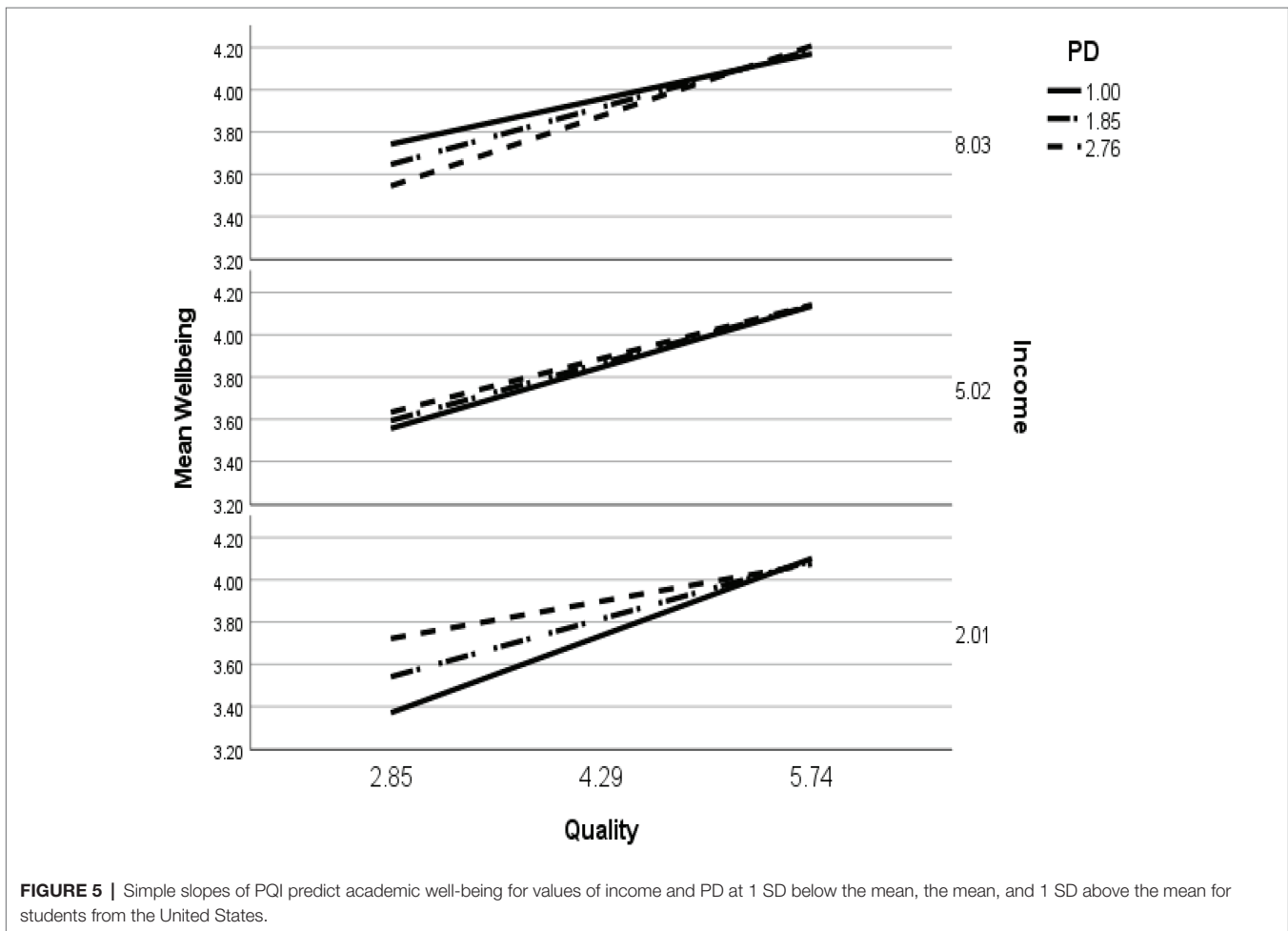
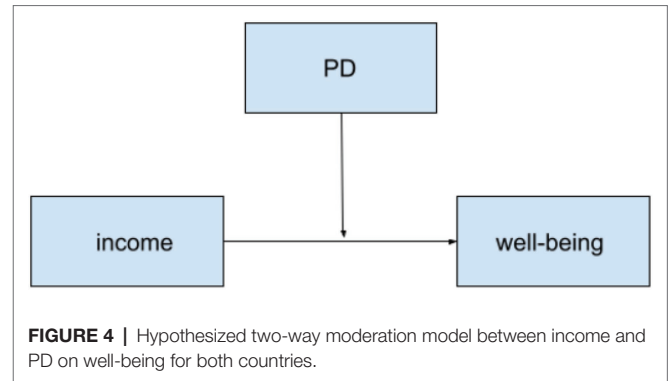
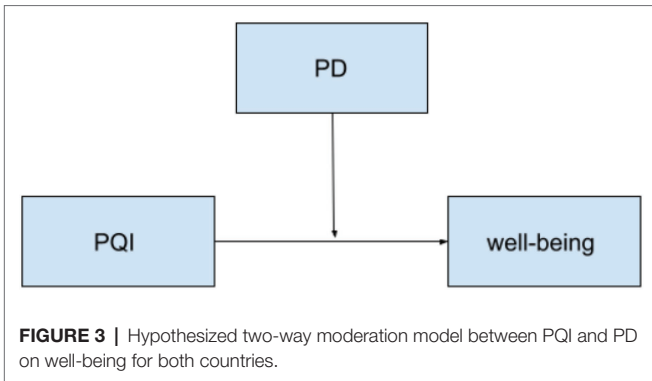
In summary, the patterns of interactions for students from the United States and South Africa were in some ways similar and other ways different, highlighting the complexity of how students may react to stressors in their academic environment. Students from the United States reported relatively similar levels of academic well-being when PQI was high, regardless of their income and PD, emphasizing the importance of high-quality instruction for all groups of students in the United States. Conversely, students from South Africa were found to have higher well-being when they had low PD, regardless of income when PQI was low, but low PD did not associate with academic well-being when PQI was high if students were middle- or high-income. This suggests that South African students' well-being benefits from high PQI, but how this associates with their well-being can also depend on their PD.

Implications

Students' academic well-being is an important precursor in their persistence in higher education. Given this, there are several implications of this research. One implication is the importance of high quality of instruction for students' well-being: with the exception of middle- and high-income South African students with low PD, the results consistently showed that high PQI was associated with higher academic well-being for students from the United States and South Africa, no matter their income or PD. Students' perceived quality of instruction is a considerable motivator in their studies (Sogunro, 2017) and so ongoing "quality control" of classes is important when contemplating the ways that COVID-19 has impacted classes.

Another consideration is how financial resources and cultural values can interact to influence students' academic well-being. Li et al. (2019, p. 1237–1238) suggest that "culture moderates how people feel about financial inequality in terms of their own finances, which then translates to how people feel generally... emphasizing the crucial role of culture as a moderator of how people react to a given reality". Considering that students from low-income families are less likely to persist in their studies under ordinary circumstances (Africa, 2005), universities around the world should examine how the pandemic negatively impacted low-income students and engage in efforts—like quality, evidence-based instruction that serves low-income students—to mitigate the challenges they experienced during the pandemic, so they can persist in their studies.

A third implication is whether the cultural values that students hold can be malleable, and, if so, whether adopting certain values can promote their academic well-being. In their research about abusive managers and employee well-being, Lin et al. (2013) suggest that employees can *develop and*



hold PD values to reduce the detrimental ways that abusive supervision affects them, thereby helping those employees maintain their well-being. Perhaps universities can help promote PD values that are associated with student success in their context. This could potentially be accomplished by developing a university climate that encourages appropriate PD values in the form of student attitudes toward their classes and/or in the form of authoritarian or egalitarian teaching styles by instructors. However, as the results of this research suggest,

the way that PD and income interact to affect outcomes may differ by country and culture so there likely will not be a one-size-fits-all approach for universities.

Limitations and Future Directions

There were some limitations in this research. First, these data were correlational and so cause-and-effect cannot be established; it could be that high academic well-being leads to high PQI, that high PQI leads to high well-being, or that both are related

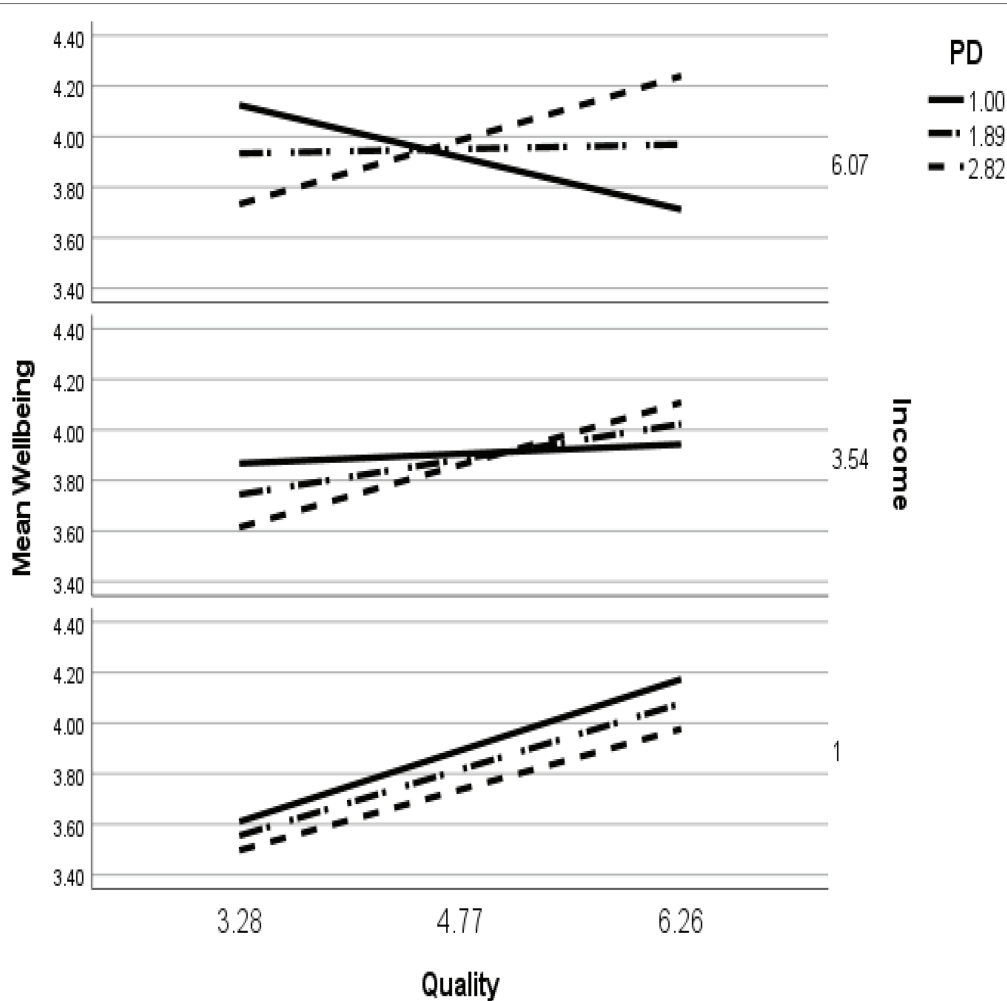


FIGURE 6 | Simple slopes of PQI predicting academic well-being for values of income and PD at 1 SD below the mean, the mean, and 1 SD above the mean for South African students.

to an unmeasured third variable, like high achievement. Next, only a few universities were sampled and so the results of this research may not be generalizable to the entire population of students in higher education in South Africa or the United States. Another limitation is that students were only asked about the overall quality of instruction that they had received since COVID-19, which may have obfuscated important distinctions between their perceived instruction in different classes. The primarily female composition of the sample was another limitation, and the results may be different if more males participated. For these reasons, replication of these results is needed.

Future directions could capitalize on these limitations by conducting similar research in additional countries and universities, by allowing students to distinguish between their PQI in different courses, and by ensuring more gender diversity in their samples. Researchers could also try to analyze these relationships in a more experimental setting or follow students over time to better establish causality.

CONCLUSION

Through high-quality instruction, students can become passionate about their studies and engage in learning behaviors that promote deep and critical thinking about the content which they are learning. Despite the many challenges that COVID-19 created in higher education, it is vital that instructors continue to provide students with classes that stimulate their learning, achievement, critical thinking, and that promote their academic well-being. Together, this can motivate students to continue in their degree persistence and flourish in their professions.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Northern Arizona University Institutional Review Board. The patients/participants provided their written informed consent to participate in this study.

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AUTHOR CONTRIBUTIONS

DD wrote the manuscript and conducted the analyses. JB edited the manuscript and provided key insights for the discussion. All authors contributed to the article and approved the submitted version.

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Tracing the Growth, Gaps, and Characteristics in Positive Education Science: A Long-Term, Large-Scale Review of the Field

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This large-scale quantitative review used publication data to track the presence of positive education terms over a 100+ year period across 35 psychology journals and education journals utilizing two analytical methods. First, computer-generated linguistic word count analysis identified that positive education terms have shown small but steady growth in psychology and education research for more than a century. From 1904 to 2016, positive education terms have risen consistently, with increases in 1952, 1982, 2010, and 2014 to over 4, 5, 6, and 7 percent, respectively. Four new terms were present in the top 20 most prevalent terms following the official launch of positive education in 2009: well-being, satisfaction, motivat*, and engag* (note: terms ending with an asterisk are word stems). Three terms also increased in rank order prevalence from 2009 onwards: emotion*; health; and goal*. The second analytical method involved in-depth human coding of a subset of positive education abstracts ($n=2,805$) by a team of five researchers¹ to identify trends pertaining to how positive education research has been conducted in terms of paradigms, designs, methods, tools, samples, and settings from 1950 to 2016. College students and students in secondary school make up the most common samples, with little research in the early childhood years. Quantitative, cross-sectional studies using self-report surveys have been the most common design and method used over the past six decades, suggesting room for growth in qualitative methods and the need for greater longitudinal and intervention designs. The human coding was also used to classify positive education variables into broader categories of research. Nine categories were identified: positive functioning; well-being; ill-being; strengths; agency; connection and belonging; identity and personality; school climate and outcomes; and demographics. By tracking positive education science over time, the current paper allows researchers to take stock of the field, identify gaps, outline areas of growth, and pursue fruitful topics for future research.

Keywords: student, education, mental health, well-being, positive psychology, positive education

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INTRODUCTION

Student mental health has become a global priority in education (WHO, 2013; UNESCO, 2015; WHO and UNESCO, 2021). The Organisation for Economic Co-operation and Development (OECD, 2015, p. 32) suggests that “[p]erhaps the ultimate goal of education policy makers, teachers, and parents is to help children achieve the highest level of well-being possible.” This aim is reflected in inter-governmental initiatives, such as “Focusing Resources for Effective School Health” (FRESH), developed through cooperation between WHO, UNESCO, the World Bank, and United Nations Children’s Fund (UNICEF) in 2000 (WHO et al., 2000; Wikipedia, 2021) and the “Health Promoting Schools” guidelines released as a joint collaboration by WHO and UNESCO (2018; United Nations, 2021).

While inter-governmental initiatives to promote student well-being have become more widespread over the past decade, these aims are not entirely new. Indeed, mental health interventions for students have been researched for more than a century (Witmer, 1897; Hildreth, 1930). The current review paper has four aims: (1) to investigate whether education-based mental health research has grown over the past century from 1904 to 2016; (2) to identify the top positive education terms that have received research attention from 1950 to 2016 and to examine trends in the proportion of these terms over time (i.e., *what* has been studied in positive education); (3) to identify the research paradigms, designs, tools, samples, and research sites most commonly used in education-based mental health research from the 1950s to 2016 (i.e., *how* has positive education been studied); and (4) to examine whether the official launch of positive education (Seligman et al., 2009) has led to a higher number of well-being-oriented, positively focused topics being studied compared to research prior to this time.

Student Mental Health Interventions: The Evolving Evidence Base

Broadly speaking, early educational mental health interventions were deficit-oriented and concerned with “treating the many difficult cases that resist the ordinary methods of the school room” (Witmer, 1897, p. 117). Over time, however, intervention programs have expanded beyond a focus on *targeted treatment* to also include *universal prevention* and, more recently, *mental health promotion* (Peterson and Park, 2003; Froh et al., 2008). Prevention programs initially targeted students at risk of developing mental disorders – that is, students identified as struggling and/or with subclinical symptoms (Herman et al., 2004). However, these were later expanded to include all students through universal approaches following the logic that prevention-oriented skills can serve as a potential “antidote to depression” for everyone (Seligman et al., 2009, p. 295). Universal mental health prevention programs are run with large groups of students regardless of risk factors or where they sit along the mental health continuum (Fenwick-Smith et al., 2018). These programs teach general skills designed to help students buffer against distress and stave off psychological illness (Jaycox et al., 1994; Pattison and Lynd-Stevenson, 2001).

Seligman et al. (2009, p. 295) argued that universal mental health interventions are not only means to prevent student distress but can also function as a “vehicle for increasing life satisfaction.” Their call formed part of a further evolution in the way educational institutions approached student mental health – this time through the adoption of *promotion programs*. Promotion programs emphasize creating curricula that bolster the positive end of the mental health curriculum as opposed to reducing the negative (Waters, 2011; Waters et al., 2017). A recent review of 221 universal positive psychology interventions (PPIs) in schools by Owens and Waters (2020) from 2010 to 2018 found prevention programs were slightly more prevalent than promotion programs (18 percent compared to 16 percent); however, they also found that the majority of programs had a dual aim of prevention *and* promotion (67 percent) by teaching skills that reduce ill-being, such as cognitive reframing, combined with skills that promote well-being, such as savoring and strengths use, and by seeking to reduce indices of ill-being (e.g., anxiety) and increasing aspects of well-being (e.g., life satisfaction).

In addition to looking at the target of programs being implemented (i.e., treatment, prevention, promotion), a brief review of the history of education-based mental health interventions reveals they have shifted through various psychological schools of thought (Dawood, 2013). For example, in the 1980s and 1990s, three notable approaches came to the fore: student coping programs (Stevens and Pihl, 1983; Schinke et al., 1987), social-emotional learning (SEL; Ladd and Mize, 1983; Creemers and Tillema, 1987), and resilience education (Stevens and Pihl, 1983; Schinke et al., 1987; Cowen et al., 1990). These approaches were primarily situated in the prevention space and aimed at helping students to reduce stress, anxiety, and depression (Reivich and Gillham, 2010).

Beginning in the early 2000s, there has been a notable growth in promotion programs aimed to increase the positive end of the mental health continuum (Keyes, 2002) and adopting positively oriented approaches, such as values education (Nielsen, 2005), character education (Berkowitz and Bier, 2005), civics education (Cogan and Morris, 2001), positive youth development (Larson, 2000), mindful education (Wall, 2005), and positive education (Seligman et al., 2009). While each approach has a slightly different orientation and focus (for an explanation of the emphasis and differences between each, see Waters et al., 2017), all can be grouped under the broad umbrella of positive psychology given that they aim to move beyond symptom amelioration to also focus on building universally applicable positive capacities in students.

Positive Psychology and Its Role in Education

Launched in the late 1990s as a way to counterbalance deficit-oriented research in psychology (Seligman, 1999), positive psychology (PP) calls for scientific inquiry into positive traits, states, processes, and capacities that help to strengthen mental health, maximize potential and cultivate pro-socialness (Seligman and Csikszentmihalyi, 2000; Sheldon and King, 2001). In line

with the view that a full state of mental health involves more than the absence of illness (Keyes and Lopez, 2002), PP focuses on the promotion of well-being – beyond the treatment of ill-being – and aims to assist people, groups, and institutions to flourish (Aspinwall and Staudinger, 2003; Gable and Haidt, 2005). Starting initially within the field of psychology, the call for positively oriented research soon spread to other fields such as business, sport, and education (Rusk and Waters, 2013; Donaldson et al., 2015).

In terms of education, PP can be seen to have played a significant role in shaping education-based mental health research since the 2000s in three key ways (Clonan et al., 2003; Salmela and Uusiautti, 2015). First, research from PP has been used to reshape treatment programs to also include a strength-based approach and adopt the premise that resilience and strengths can be unlocked in struggling students given the right support (Steck et al., 2003; Prout, 2009). Second, early findings coming from PP helped schools to expand their prevention-oriented programs to include lessons that promoted positive attributes and outcomes (Lubinski and Benbow, 2000; Akin-Little et al., 2003). Third, given that positive psychology could be taught to all students, not just those who are at risk or are in need of remediation, it widened mental health promotion programs to become whole-school approaches (Miller et al., 2009; Allen et al., 2018b). In these three ways, we can see how the arrival of PP in 1999 has shaped education-based mental health research since the 2000s.

Adding to the above, PP further consolidated its role in education-based mental health research through findings showing that aspects of PP (e.g., hope, character strengths, and gratitude, to name a few) were predictive not only of student mental health but also of academic achievement (Snyder et al., 2002; Austin, 2005; Froh et al., 2008). Moreover, and notwithstanding moderators of intervention effects that require further study, PP interventions can be applied across multiple student contexts and practiced outside of the school (e.g., Huppert and Johnson, 2010), making them relatively accessible and scalable (Chafouleas and Bray, 2003). Finally, PP was shown to be applicable to teachers and faculty (McGovern, 2011; Critchley and Gibbs, 2012), which is important given that teacher well-being is associated with a range of student outcomes, including well-being and academic results (Oberle and Schonert-Reichl, 2016). Finally, positive psychology research has also adopted ecological theories of well-being and organizational change models to inform whole-school and whole-university change (Hoy and Tarter, 2011; Oades et al., 2011a,b), thus further bolstering its place in shaping education-based mental health research.

The application of PP to education was given the name “positive education” by Seligman et al. (2009, p. 294), who argued that educational institutions should “teach both the skills of well-being and the skills of achievement.” More recently, Waters and Loton (2019) described positive education as a field that weaves contemporary knowledge from the science of well-being into educational practice.

While initial studies identified as positive education distinguished themselves from earlier education interventions by focusing on the teaching of specific PP skills, such as

gratitude or hope to promote the positive end of the mental health continuum (see Waters, 2011), the boundaries between positive education and other movements are often blurred (Kristjánsson, 2012). For example, Quinlan et al. (2014) conducted an intervention on character strengths that was published in the *Journal of Positive Psychology*. This intervention was situated within the positive education literature but is also clearly an intervention that falls within the field of character education. Similarly, Huppert and Johnson (2010) evaluated the impact of a mindfulness intervention on psychological well-being and published it in the *Journal of Positive Psychology*. This intervention is considered to be positive education because of its aim to promote well-being (many other mindfulness interventions focus on reducing anxiety and stress; see Waters et al., 2015 for a review of mindful intervention in education) but it is also clearly an intervention that falls within the mindful education movement. Moreover, while both of the interventions mentioned above were classified by the authors as positive education studies, they align closely to the positive youth development movement. Our intention with these examples is to show that the education-based mental health movements arising in the 2000s are more common than they are different and, for the purpose of the current review paper, rather than draw boundaries between these movements, we will adopt a broad net to include all education-based mental health research that is positively oriented as belonging to “positive education.”

Existing Positive Education Reviews

Positive education has been heralded as a fast-growing field of science (Shankland and Rosset, 2016; Chodkiewicz and Boyle, 2017). This expansion has motivated researchers to take stock of the field as a whole: the breadth, direction, key topics, and methods used. Review papers on positive education can provide a cumulative synthesis of knowledge on the conditions and processes that promote student well-being. Additionally, from the perspective of prioritizing future science, these reviews can be used to identify research trends and gaps in terms of the constructs studied and also in terms of research designs employed.

Prior to describing the current review, it is worthwhile examining the existing positive education reviews to learn about what the reviews focused on, how they were conducted and what scope and timelines have been used to ensure that a new review is adding additional knowledge. To date, there have been 17 reviews conducted on various facets of positive education published since its inception in 2009. These review papers align with Owens and Waters’ (2020) criteria that positive education research includes well-being skills and/or well-being indicators. The details of these review papers are outlined in **Table 1**.

The existing reviews on positive education provide useful data about the topics that have gained focus in positive education. To date, these include resilience, SEL, coping, mindfulness, strengths, gratitude, hope, emotions, emotional intelligence, positive relationships, school belonging, and

TABLE 1 | Existing positive education review papers.

Author and year	Focus	Type of review/ method used	Data source	Sample	Time span of review	Data set	Sample size (n = Articles)
Brunwasser et al. (2009)	Penn Resiliency Program	Meta-analysis	PsycINFO	Students	1990–2009 (10 years)	Published RCT studies	17
Durlak et al. (2010)	After-school SEL programs	Meta-analysis	PsycINFO plus three targeted journals	Students	1980–2007 (27 years)	Published intervention studies using RCT designs United States only	75
Durlak et al. (2011)	SEL programs	Meta-analysis	PsycINFO plus 11 targeted journals	Students	1970–2007 (30 years)	Published peer-reviewed intervention studies	213
Waters (2011)	School-based interventions covering resilience, gratitude, serenity, character strengths and hope	Qualitative review	PsycINFO	Students	2007–2011 (4 years)	Published peer-reviewed articles	12
Froh et al. (2011)	76 positive education constructs	Content analysis: text search using a list 76 positive psychology terms	Four targeted journals	Information not provided	1960–2008 (48 years)	Published peer-reviewed articles, intervention studies, basic research, applied research	1,168
Kristjánsson (2012)	Search for positive psychology topics in education	Critical review: text search	One targeted journal	Information not provided	2002–2012 (10 years)	Published peer-reviewed articles	Information not provided
Meiklejohn et al. (2012)	School-based mindfulness interventions	Systematic review	Information not provided	Teachers and students	2005–2010 (5 years)	Published peer-reviewed articles	Three teachers, 14 students
Waters et al. (2015a)	Contemplative education interventions (i.e., mindfulness, yoga, meditation)	Systematic review	Web of Science database	Students	1989–2011 (22 years)	Published peer-reviewed articles, intervention studies, and case studies	15
Taylor et al. (2017)	Positive youth development and SEL programs	Meta-analysis	PsychINFO, Dissertation Abstracts, and Medline + ten targeted journals	Students	1970–2014 (4 years)	Published peer-reviewed intervention studies and published reports	82
Maynard et al. (2017)	Mindfulness	Systematic review	Australian Education Index, British Education Index, CBCA Education, Education Complete, ERIC, MEDLINE, ProQuest Dissertations and Theses, PsycINFO, Social Science Citation Index, Social Service Abstracts, Sociological Abstracts, SPORTDiscus	Students	1990–2016 (26 years)	Published peer-reviewed articles, unpublished studies, conference abstracts and proceedings, and other gray literature	61
Shankland and Rosset (2016)	Brief school-based PPIs that focused on mindfulness: gratitude, strengths, and positive relationships	Conceptual review	Information not provided	Students	2005–2015 (10 years)	Published peer-reviewed papers, review papers, interventions studies, and cross-sectional studies	16
Allen et al. (2018a)	School belonging	Meta-analysis	PsycINFO and file drawer	Students	1993–2013 (20 years)	Published peer-reviewed articles and file correlational and longitudinal studies	51
Waters and Loton (2019)	School-based interventions covering strengths, emotions, awareness, coping, habits and goals	Systematic review	Scopus, Google Scholar, PsycINFO, Web of Science. ancestry method	Students	1987–2016 (29 years)	Published peer-reviewed intervention studies	75

(Continued)

TABLE 1 | Continued

Author and year	Focus	Type of review/method used	Data source	Sample	Time span of review	Data set	Sample size (n = Articles)
Kumar and Mohideen (2019)	Character strengths	Scoping review	EBSCO, JSTOR, PubMed, Google Scholar, ProQuest, and ScienceDirect	Students	2000–2018 (18 years)	Original published research or theses/dissertations	13
Owens and Waters (2020)	PPLs in schools	Qualitative review	PsycINFO, ancestry method; Google Scholar's forward search option ("cited by") was used to find newer articles that cited the older articles found	Students	2010–2018 (18 years)	Peer-reviewed articles	212
MacCann et al. (2020)	Emotional intelligence	Meta-analysis	ERIC, Google Scholar, ISI Web of Science, Medline, ProQuest Dissertations and Theses, PsycINFO, PubMed, ScienceDirect, and Scopus	Students	2004–2016 (12 years)	Published studies, unpublished data, test manuals, dissertation, and conference presentations	162
Lavy (2020)	Character strengths	Integrative overview	Google Scholar, Scopus databases; ancestry method using reference lists of strengths interventions and VIA Institute character strengths publications	Students	2011–2015 (4 years)	Published intervention studies using RCT designs	Four

habits and goals. Fifty-eight percent of the reviews conducted in positive education focused on single topics such as emotional intelligence (e.g., MacCann et al., 2020) or character strengths (e.g., Lavy, 2020); 27 percent reviewed multiple topics that were preset (e.g., Shankland and Rosset, 2016 reviewed mindfulness, gratitude, strengths, and positive relationships); and two reviews did not start with a predetermined set of topics, but instead searched with a broad net to find all positive education topics (Froh et al., 2011; Kristjánsson, 2012).

Beyond identifying core topics in positive education (i.e., topics that have had a large enough number of studies to warrant a review), the existing review papers also provide information about the samples, timelines, and scope used to provide a big picture of positive education. With regard to samples, 88 percent of the reviews focused on students, with one review also including teachers, and two studies not specifying. A look at timelines shows that the review periods ranged from 4 years to 48 years, with the majority of reviews looking at a period of 10 years or less (41 percent). With regard to the scope, the number of papers included in the review data sets ranged from four to 1,168 (mode = 17; median = 56; mean of 137.06 ± 283.54), with 75 percent of the review studies containing less than 100 papers. In terms of method of analysis used in the review papers, the three most common types of reviews were meta-analysis (35 percent), systematic reviews (24 percent), and qualitative reviews (12 percent). Of relevance to the current paper, two studies used the analytical method of text analysis (i.e., Froh et al., 2008; Kristjánsson, 2012) to

trace the growth of positive education over time and to identify the topics that have received focus.

The review papers conducted to date provide useful information about the growth and impact of positive education. This information is timely given the increased focus on student well-being in the past two decades and the impact of the COVID-19 (SARS-CoV-2) pandemic on student mental illness (Marques de Miranda et al., 2020). However, given that the bulk of the existing reviews focused only on a small range of preset specific topics or interventions, much of the field of positive education has not yet been represented in research syntheses. Add to that the reasonably small data sets (the majority contained less than 100 studies) and it is clear that previous review papers have been restricted from presenting a view of the full scope of positive education research. Finally, as existing reviews utilized relatively short timelines (the majority of reviews looking at time periods of 10 years or less), there has yet to be an analysis of how the earlier school-based mental health research has shaped the current science, how positive education research has (or has not) grown over time, and whether the official launch of positive education in 2009 triggered a higher rate of well-being-oriented, positively focused topics being studied. Further reviews are needed to provide a longer-term and more comprehensive oversight of this growing field.

These gaps have motivated the current review paper, which seeks to provide a long-term big picture overview of positive education. To accomplish this, a review method is needed that can sift through and synthesize the large array of research

TABLE 2 | Journals selected to form the database for current review paper.

Journal	Abstracts
Educational journals	
Journal of School Psychology	1,650
Psychology in the Schools	2,679
School Psychology Review	1,531
School Psychology	297
Educational Psychologist	756
Journal of Character Education	140
Educational Research Review	150
School Mental Health	184
Journal on Educational Psychology	233
Contemporary Educational Psychology	1,235
Educational Psychology	1,238
British Journal of Educational Psychology	2,180
Journal of Educational Psychology	8,854
Positive psychology/well-being journals	
Psychology of Well-Being	39
International Journal of Qualitative Studies on Health and Well-Being	286
The Journal of Positive Psychology	425
Journal of Happiness Studies	735
Child, adolescent and development psychology journals	
Applied Developmental Science	330
Journal of Applied Developmental Psychology	1,220
Developmental Science	1,294
Journal of Youth and Adolescence	2,003
Journal of Adolescence	2,207
Developmental Psychology	5,691
Child Development	7,204
Journal of Adolescent Research	855
Other	
Emotion	1,259
Journal of Consulting Psychology	2,614
Social Indicators Research	2,695
Psychological Science	3,496
Journal of Clinical Psychology	5,134
American Psychologist	7,725
Psychological Bulletin	7,963
Personality and Individual Differences	9,216
Journal of Consulting and Clinical Psychology	6,676
Journal of Personality and Social Psychology	9,485

topics and methods in positive education that have been studied over time. While the review methods that have most commonly been used in positive education to date are meta-analysis and systematic reviews, these methods use predetermined categories (i.e., meta-analysis starts with a preset lens on certain positive education interventions and/or specific outcomes to quantify their magnitude of impact *via* effect sizes) and are not able to handle very big data sets (e.g., findings from systematic analyses are typically researcher coded and, thus, utilize relatively small data sets). As such, we followed Froh et al.'s (2008) and Kristjánsson's (2012) use of the analytical method of text analysis – but did so with a much larger sample. The current review method combines language analysis of a large corpus of psychology and education journal articles to identify *what* is being studied in positive education with a more detailed human

analysis of a smaller but substantial subset of positive education abstracts to determine *how* positive education has been studied. The language analysis broadly aligns with bibliometric studies (see Donthu et al., 2021 for a guide), which have been used to examine very large fields of research, including PP (Rusk and Waters, 2013). Language analysis paired with machine learning is increasingly used to study varied aspects of well-being (D'Alfonso, 2020). The human analysis component aligns broadly with systematic reviews, especially those that focus on abstracts to identify study design characteristics (see, for example, Acosta et al., 2001).

MATERIALS AND METHODS

Step 1: Sample

The current study followed the method used by Durlak et al. (2010, 2011), Froh et al. (2011), Kristjánsson (2012), and Taylor et al. (2017) of selecting targeted journals to create the database.² The researchers above identified specific journals in a range of fields, including education, school psychology, child psychology, adolescent psychology, developmental psychology, prevention psychology, clinical psychology, and community psychology. The same method was used in the current study to identify the data set from within which the abstracts could be reviewed to investigate research trends in positive education. The first step was to review the journals used by the above authors and determine which of those were to be included in the current database. From the existing review papers, we included the *Journal of Consulting and Clinical Psychology*, *Child Development*, *Journal of Adolescent Research*, *Journal of School Psychology*, *Psychology in the Schools*, *School Psychology Review*, *School Psychology*, and *Educational Psychologist*. The next stage was to expand the list by going through the references of review papers outlined in **Table 1** to determine whether there were any other journals that were frequently mentioned by these positive education reviews. Following this, relevant journals from the newer fields of PP and well-being science were also included.³ Finally, the draft journal list was sent to five positive education experts⁴ who were asked to review the list and recommend addition journals. In total, 35 journals formed the database for this study (see **Table 2**).

²As shown in Table 1, the use of targeted journals to find relevant papers was used by 29 percent of former positive education review papers.

³Journals from the broader fields of positive psychology and well-being science were not included by Froh et al. (2011), who used four school psychology journals; Kristjánsson (2012) reviewed one journal – the *Education Psychologist*; Durlak et al. (2010, 2011) as well as Taylor et al. (2017) focused more specifically on SEL as opposed to the broader field of positive education and while their databases also included some prevention-oriented journals there was no inclusion of promotion-oriented positive psychology and well-being journals. We rectified this in our list by adding positive psychology and well-being journals to the database.

⁴Two experts were known by their publications in top-ranked journals: two were editors of positive psychology or education journals and one was the chair of the Positive Education Division of the International Positive Psychology Association.

Following the finalization of the journal database, abstracts from each of the 35 journals were downloaded dating back as far as the journal's inception. The earliest year in the database was 1904 for *Psychological Bulletin*. Abstracts were downloaded for all 35 journals through to end of 2016. If a journal changed its name, the contemporary title was also included to ensure all abstracts were coded as belonging to that journal over time (e.g., *Journal of Research in Character Education* became *Journal of Character Education*; *Professional School Psychology* became *School Psychology*). We encountered a number of duplicated abstracts throughout the data set that were removed ($n=1,003$). Abstracts with no valid year or date of publication, or journal title, were also removed ($n=14$). The final data set consisted of $n=98,571$ abstracts across the 112-year period.

Step 2: Key Search Terms

After establishing the database, a list of key terms was formed to identify the presence of positive education studies across the 35 journals. A positive education dictionary of terms was built by reviewing eight prior studies that had developed positive education and PP term lists. Prior terms in positive education that were included in the current list included Froh et al.'s (2011) full list of 76 positive terms in school psychology (e.g., flow, mindfulness, savoring, and purpose), a selection of terms from Allen et al.'s (2018a) meta-analysis on school belonging and well-being (e.g., school bonding, teacher, and performance) and a selection of search terms from the SEL meta-analyses by Durlak et al. (2011) and Taylor et al. (2017; e.g., academic achievement, emotions, regulation, and social skills). Beyond the education-specific studies, the VIA Institute on Character's list of 24 character strengths was included (Peterson and Seligman, 2004; e.g., curiosity, love of learning, kindness), as was the list of PP terms generated by Lopez et al. (2006; e.g., empathy, coping, self-efficacy, optimism, and vitality)⁵ and the full list of 233 PP terms developed by Rusk and Waters (2013) in their bibliometric review of PP (e.g., meaning, flourishing, resilience, autonomy, hardiness, and self-awareness). In the case where a term overlapped across the various lists above, the term was included only once in the current dictionary. The draft dictionary was then sent to five experts in the field who reviewed the list and made suggestions for additional terms. The final list of positive education terms totaled 291 and comprised two sublists: one for education and one for PP (see Table 3).

Step 3: Filtering the Larger Data Set for Positive Education Abstracts

To be confident that the abstracts included in the final analysis were focused on positive education (as opposed to PP/well-being research not done in education or education research that did not focus on positive topics/well-being), we filtered the data set to include abstracts that had at least one word or word stem from the PP dictionary *and* from the education dictionary (see Table 3). This step took the data set from 98,571 abstracts to 74,496.

⁵The Lopez et al. (2006) list was also included in Froh et al. (2011).

Analysis Method Part 1: Linguistic Analysis

Linguistic Inquiry and Word Count (LIWC) software was used to generate a proportion of each abstract made up of key terms from the positive education dictionary. LIWC software calculates both a total proportion of the abstract made up of any of the terms in the positive education dictionary, as well as the prevalence for the individual terms comprising the education dictionary, after excluding punctuation (see Pennebaker et al., 2007).

Analysis Method Part 2: Human Coding

While the linguistic analysis will examine *what* topics have been studied in positive education over time, we also aimed to examine *how* positive education is being researched. Data were collected on the types of study designs used in positive education (e.g., cross-sectional, longitudinal, and intervention) as well as samples (e.g., students, teachers, and school leaders), research tools (e.g., survey, interview, and classroom observation), the way variables were classified (correlational, independent, and dependent), and settings within which positive education has been conducted. These types of data required detailed human coding. The sample size of 74,496 exceeded the capacity of the researchers to code and, as such, a smaller subset of abstracts was coded. We decided to code the top 2,000 abstracts containing the highest proportion of positive education keywords. In the end, the budget set aside to enable human coding covered slightly more than 2,000 abstracts and the total number of abstracts coded was 2,805. All abstracts were confirmed by coders to have been conducted with student samples and/or in an educational setting (e.g., kindergarten, school, classroom, after-school program, and college/university) and all studied PP topics (note: the abstracts could also contain deficit-based concepts – for example, a study that measures depression together with happiness). At the start of this human coding process, a subsample of 120 abstracts were dual-coded, which involved the second author also coding the same abstracts of a number of all four other coders. This multi-rate data set was the basis for testing inter-rater reliability. Percentage agreement across key nominal research design characteristic variables ranged from 97.7 percent to 100 percent: Cohen's (1960) kappa ranged from $\kappa=0.66-1$. Continuous variable agreement was assessed using a two-way mixed, absolute single measures intra-class coefficient (ICC; McGraw and Wong, 1996), and ranged from ICC=0.95 to 0.99, indicating very high agreement.

RESULTS

Analysis of Positive Education Term Frequency Over Three Time Frames

The analyses for this review paper focused on three key time frames. First, the data set from 1904 to 2016 was used to track the overall prevalence of aggregated positive education terms in the education and psychology journals for the 112-year period ($n=74,496$). This was done to discover the historical roots of positive education and to examine growth trends in positive education for over a century of research. Researching the overall prevalence of positive education terms across this long time frame provides a big picture of the field.

TABLE 3 | Words and word stems forming the positive education dictionary.

Education Dictionary		Positive Psychology Dictionary							
academ*	middleschool*	accept	benefi*	concentrat*	energ*	gratitude	judgment	organis*	purpose
adolescen*	numeracy	acceptance	blessing	confidence	engag*	grit	judgment	organiz*	pursuit*
child*	postgrad*	accomplish*	bounce	confident	enhanc*	growth	kind	original*	pwb
class	preschool*	achiev*	brave*	connect	enlighten*	habit*	kindhearted	passion*	qi gong
classmate*	primary	adaptiv*	breathe	connected	ethic*	happier	kindness	pathway*	quality
classroom*	principal	adjusted	broaden*	connection*	eudaemon*	happiness	leader*	patience	rational*
college*	principals	adjustment	buoyan*	conscientious*	eudaimon*	happy	love	patient	reapprais*
curricul*	professor*	admir*	capabilit*	constru*	exceptional*	hardiness	loving*	peace*	recover
educat*	pupil	affect	capital	contemplat*	existential	health	master*	peak	recovery
elementary	pupils	affective	care	control	expecta*	hedonia	meaning*	perfect*	reflect*
faculty	read	affects	caring	cooperat*	extrinsic	hedonic	meditat*	perform*	refocus*
freshman	reader	affirm*	change	cope	fair*	honest*	mental	persever*	refram*
freshmen	reading	agency	character	coping	faith*	honor	mentor*	persist*	regulat*
freshwoman	scholar*	agentic	charit*	counsel*	feeling*	hope*	merciful*	perspective*	relatedness
freshwomen	school*	altruis*	citizen*	courag*	flourish*	humble*	mercy	plan	relational
GPA	secondary	apprais*	civic*	creativ*	flow*	humility	metta	planner	relationship*
grade	senior	appreciate	climate	critical	forgiv*	humor*	mind	planning	resilien*
grades	sophomore	appreciation	coach*	curio*	friend*	identi*	mindful*	plans	resource*
grammar	student*	appreciative	cognitive*	dependab*	fulfil*	imagin*	mindset*	play	respect*
headmaster*	studies	approach	coheren*	determination	fun	includi*	mission*	playful*	responsive
instruc*	study*	attachment	coherence	determined	functioning	incremental	modest*	positiv*	salutog*
junior	teach*	attent*	cohesion	dilligen*	game*	industr*	mood	posttraumatic	satisfaction
kinder	tertiary	attribut*	cohesive	discipline*	gamifi*	ingenu*	moods	post-traumatic	savor*
kindergarten*	tutee	authent*	collaborat*	discover*	genero*	insight*	moral*	prayer	sel
kindergartner*	tutor*	autonom*	communal	discretion	genuine*	integrity	motivat*	prosocial*	self*
kindy	undergraduate	aware	communicat*	disengag*	gifted*	intention	noncognitive	pruden*	service*
learn*	universi*	awareness	communities	efficacy	giver	interest*	non-cognitive	psychological	sharing
literacy	upperclass*	beauty	community	effort*	giving	interpersonal*	openminded*	psycho-social	sincer*
literate	varsit*	belief*	compassion*	emotion*	goal*	intrinsic	open-minded*	psycho-social	sisu
math*	young	believe	competenc*	empathy	grateful*	involve*	optimal*	psychotherapy	social*
middle	youth	belong*	competent	empower*	gratifi*	joy*	optimis*	ptg	spiritual*

Terms ending with an asterisk are word stems. All words beginning with the prefix before the asterisk are counted as an instance of that word, regardless of the suffix. For example, sincerity and sincere would both be counted as an instance of sincer.*

Once the long-term aggregated prevalence of positive education terms was identified, the next step was to engage in a more granulated analysis of the specific terms that have gained the most research attention in the field. To make this analysis, the time frame was adjusted to focus on 1950 onwards. The years prior to 1950 were removed owing to the smaller numbers of abstracts from 1904 to 1949 relative to the 1950s onwards, when science in mental health showed a continuous growth. For example, the average number of abstracts per year between 1950 and 1960 was $M=361.50$ ($SD=37.69$), which had increased to $M=1,902.70$ ($SD=299.70$) by the years 2000–2009. Together with the growth in mental health science from the 1950s onwards, the variation in prevalence of key terms from year to year also reduces. Prior to 1950, larger fluctuations in positive education term prevalence across each year in the data are generally evident (refer to the bold, linear trend line in **Figure 1**), thus making it difficult to establish meaningful and sustained trends prior to 1950. While the smaller numbers and larger variation prior to 1950 allowed for an analysis of aggregated positive education terms, the fine-tuned analysis on specific education terms requires the more consistent data emerging from the 1950s onwards.

When analyzing positive education terms used from 1950 onwards, the data were further split into two segments:

1950–2008 ($n=50,938$) and 2009–2016 ($n=17,703$). This decision was made due to the official coining of the term and launching of the field of “positive education” by Seligman et al. (2009). By separating the data into these two time frames, insights can be gained as to whether there were any prevalent changes in research topics and directions before and after the official launch of positive education.

Finally, given that the focus of this review paper was on growth in positive education, the analysis for all data from 1950 onwards concentrated on the top 20 most prevalent positive education terms as we reasoned that it these that are reflective of growth in the field. This filtering also allowed the large data set to be manageable within the confines and word limits of a peer-reviewed journal article.

Time Frame 1: 1904–2016

The first aim of this review paper was to gain a big picture view of positive education research over the past century. The proportion⁶ of positive terms, both in total (i.e., any term in the dictionary; see **Table 3**) and in specific terms relative to

⁶The *proportion*, rather than the *raw number*, of positive terms was calculated to control for the trend of growing research output (i.e., the increasing numbers of abstracts in the data set for each passing year).

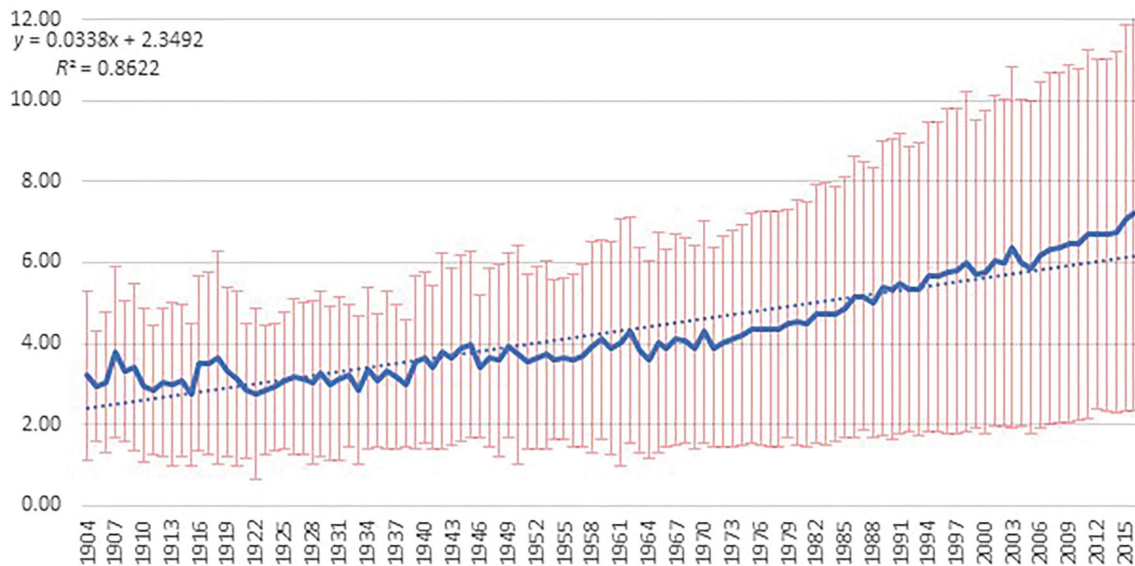


FIGURE 1 | Yearly prevalence of all positive education terms in the complete data set.

others, were examined across the time frame 1904–2016 ($n=74,496$ abstracts). More specifically, LIWC software generated the proportion of every individual abstract made up of any term in the positive dictionary (the total positive education terms in the abstract) and each specific term, after discounting punctuation terms (Pennebaker et al., 2007). To examine trends over time, mean prevalence for the total and specific terms was calculated for each year in the data set. Then, the mean for each term across all years was generated (i.e., a mean of means). This allowed examination of trends in the psychology and education journals that formed our database across a 112-year period.

As can be seen in **Figure 1**, the prevalence of positive terms has had a small but steady growth for more than a century. From 1904 to 2016, the linear trend line shows a consistent upward trajectory, explaining 85 percent of variance over time (intercept=2.35; $b=0.02$). The linear trend (dotted horizontal line) shows that by 1952, the prevalence of positive terms consistently sat above the 4 percent mark. From 1982 onwards, positive terms continuously occupied 5 percent of the proportion of research relative to other terms. By 2010, the linear line rose to be consistently above 6 percent. The yearly prevalence line provides further information about how positive terms vary across individual years, and it can be seen that by 2013, the proportion of positive terms in research had climbed above 7 percent. Recall that LIWC produces a proportion and hence controls for the growing corpus of text and suggests more of a growing focus within that larger body of work on positive terms.

Time Frame 2: 1950–2008

After gaining a big picture overview of the growth of positive education terms studied in the literature across more than a century of research, we focused the next analyses from 1950

onwards. In order, from most to least prevalent, the top 20 positive education terms studied from 1950 to 2008 were self*; social*; relationship*; perform*; positiv*; emotion*; identi*; control; cognitive*; achiev*; well; health; strateg*; mental; goal*; attent*; motivat*; involve*; change; and affect. **Table 4** provides the means and standard deviations for these top 20 positive education terms across this time period.

As well as identifying the mean prevalence, rank order, and relative proportion of the top 20 terms from that time period, we also traced the growth patterns of each of these 20 terms across the 58 years. **Figures 2A–D** present the trends in growth across each term over time. Self* was the only individual term to reach a prevalence above 4 percent. The following four terms started high in the 1950s but there was an observable decline in research from the 1960s onwards: perform*; well; mental; and achiev*. Control was also a term that became less prevalent from the 1990s onwards. All other positive education terms that were in the top 20 from 1950 to 2008 increased over time. **Figures 2A–D** show that three terms had considerable variability in research prevalence over the 68 years: health; motivat*; and change. Research into self and emotion showed a sizeable increase in prevalence in the late 1980s.

Time Frame 3: 2009–2016

After analyzing the prevalence and growth of positive education from 1950 to 2008, we focused the next analyses for the period that marked the official launch of positive education by Seligman et al. (2009). The top 20 terms for the period 2009–2016 were self*; social*; relationship*; emotion*; positiv*; identi*; perform*; health, cognitive*; control; achiev*; well-being; goal*; satisfaction; motivat*; well; engag*; strateg*; attent*; and affect. **Table 4** provides the means and standard deviations for these top 20 positive education terms. **Table 4**

TABLE 4 | Mean and standard prevalence of top 20 terms 1950–2008 and 2009–2016.

1950–2008		2009–2016		Rank order changes for 2009–2016 compared to 1950–2008
Term	Mean and SD	Term	Mean and SD	
self*	0.29 ± 0.84	self*	0.39 + 1.00	–
social*	0.28 ± 0.78	social*	0.34 + 0.85	–
relationship*	0.18 ± 0.58	relationship*	0.28 + 0.67	–
perform*	0.21 ± 0.59	emotion*	0.26 + 0.84	Increased by three places
positiv*	0.16 ± 0.42	positiv*	0.26 + 0.62	–
emotion*	0.15 ± 0.65	identi*	0.17 + 0.11	–
identi*	0.13 ± 0.50	perform*	0.17 + 0.11	Decreased by five places
control	0.12 ± 0.48	health	0.14 + 0.53	Increased by five places
cognitive*	0.11 ± 0.45	cognitive*	0.13 + 0.45	–
achiev*	0.11 ± 0.50	control	0.13 + 0.49	Decreased by two places
well	0.08 ± 0.26	achiev*	0.12 + 0.50	Decreased by one place
health	0.07 ± 0.45	well-being	0.11 + 0.50	New term
strateg*	0.07 ± 0.42	goal*	0.11 + 0.61	Increased by two places
mental	0.07 ± 0.36	satisfaction	0.11 + 0.52	New term
goal*	0.07 ± 0.38	motivativ*	0.10 + 0.46	New term
attent*	0.07 ± 0.42	well	0.09 + 0.26	Decreased by five places
motivativ*	0.07 ± 0.42	engag*	0.09 + 0.42	New term
involve*	0.05 ± 0.39	strateg*	0.08 + 0.39	Decreased by five places
change	0.05 ± 0.52	attent*	0.08 + 0.40	Decreased by three places
affect	0.05 ± 0.65	affect	0.08 + 0.40	–

* = word stem.

also shows the rank order differences in terms as they appeared in the time frame of 2009–2016 compared to the earlier time frame of 1950–2008. Four new terms were present in the top 20 most prevalent terms following the official launch of positive education in 2009: well-being; satisfaction; motivativ*; and engag*. The following terms increased in rank order status from 1950–2008 to 2009–2016: emotion*; health; and goal*. It is also of interest to note that for the positive terms that remained in the same rank order between the two time periods, the mean prevalence was consistently higher in 2009–2016 compared to 1950–2008. For example, the mean prevalence rate for self* increased from 0.29 in 1950–2008 to 0.39 in 2009–2016; social* went from 0.28 to 0.34; relationship* from went from 0.18 to 0.28; positiv* went from 0.16 to 0.26, and so on. The following terms decreased in the rank order status across the two time frames: perform*; control; achiev*; well; strateg*; and attent*.

The growth patterns of each of the top 20 terms in positive education in 2009–2016 can be seen in **Figures 3A–D**. Self* was the only term that hit a prevalence level of above 4 percent but by 2016, social* came very close, with a prevalence of 3.9 percent and the trend line for social* suggests that it will continue to grow. Ten variables showed slight declines in prevalence in 2009–2016: emotion*; achiev*; well, attent*; mental; motivativ*; attrib*; involve*; change; and attribut*. The remaining ten variables showed slight increases in prevalence from 2009 to 2016: self*; social*; relationship*; perform*; positiv*; ident*; goal*; strateg*; health; and affect.

While the focus of this paper is on growth in positive education, it seems worthwhile to also identify under-examined terms in the field. To do this, we combined the two time

frames above to create a data set for the period 1950–2016 to identify the terms that had a prevalence of less than 0.001. There were 37 positive education terms that met the baseline cutoff: appreciative; blessing; bounce; brave*; breathe; diligen*; discretion; enlighten*; eudaemon*; gamifi*; giver; hedonia; honor; humble*; ingenu*; kindhearted; merciful*; mercy; metta; non*cognitive; noncognitive; open*minded*; openminded*; patience; planner; psycho*social*; qi.gong; refocus*; savor*; sisu; tai.chi; tai*chi; tenac*; thankful*; valor*; vigor; and zest. The results of this final analysis from the LIWC point to under-investigated topics in the field of positive education and highlight some areas for potential growth in future research.

Human-Coded Analysis of Research Design Trends in Positive Education Research for the Period 1950–2016

The language analysis above made use of three large data sets and used computer-generated coding to identify the growth and decline of topics studied in positive education over time. By detecting the presence of positive terms since 1904 and discovering the top 20 terms studied in positive education in 1950–2008 and 2009–2016, we can gain a picture about *what* has been studied in positive education. The second phase of the analysis aims to review *how* positive education has been researched over time. To gather accurate data about research designs used in positive education, the analytical method needed to shift from computer-generated analysis to human coding. The abstract data set, which had already been filtered to records that include at least one term from the education and positive dictionaries and from 1950 onwards, was then ordered by the

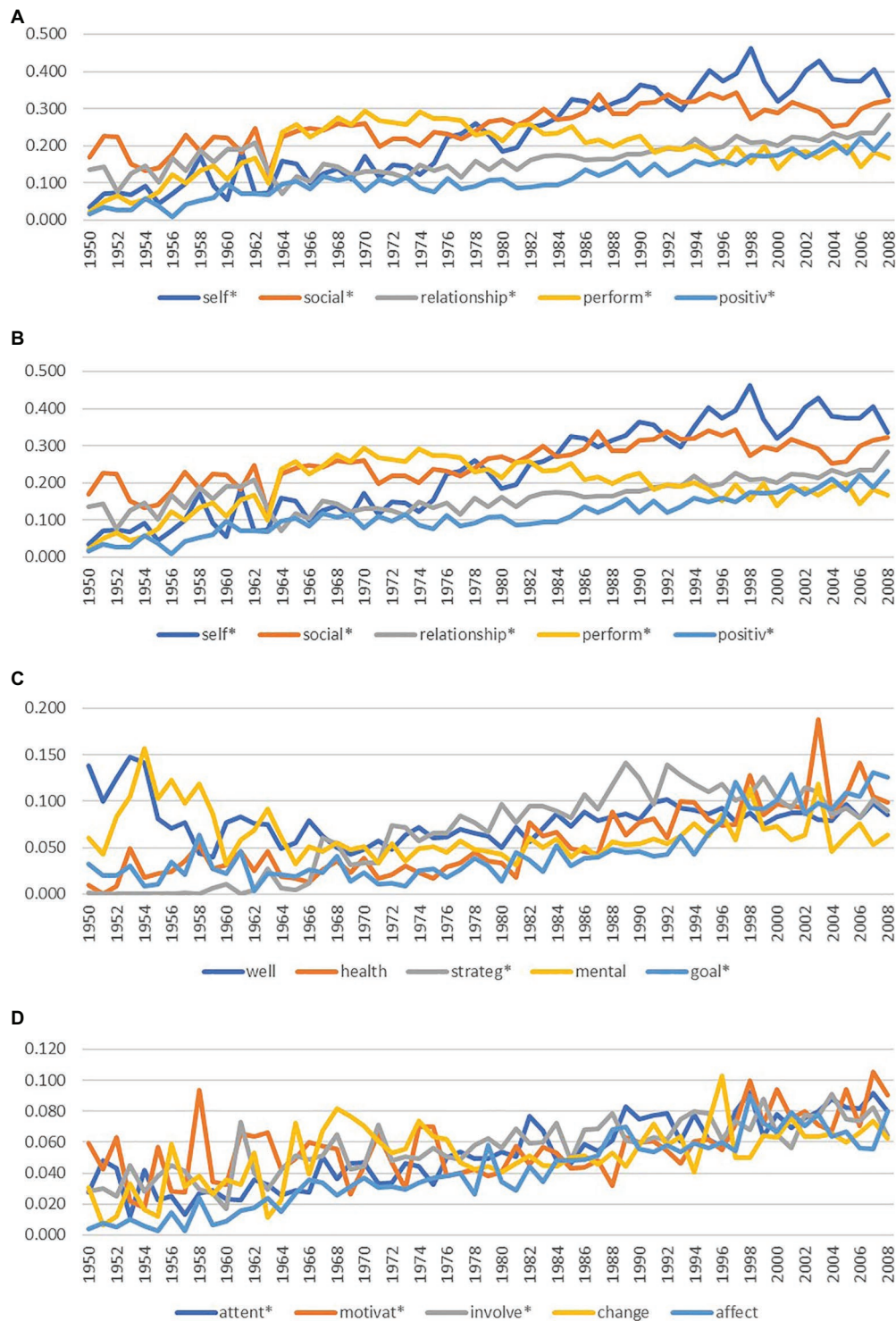
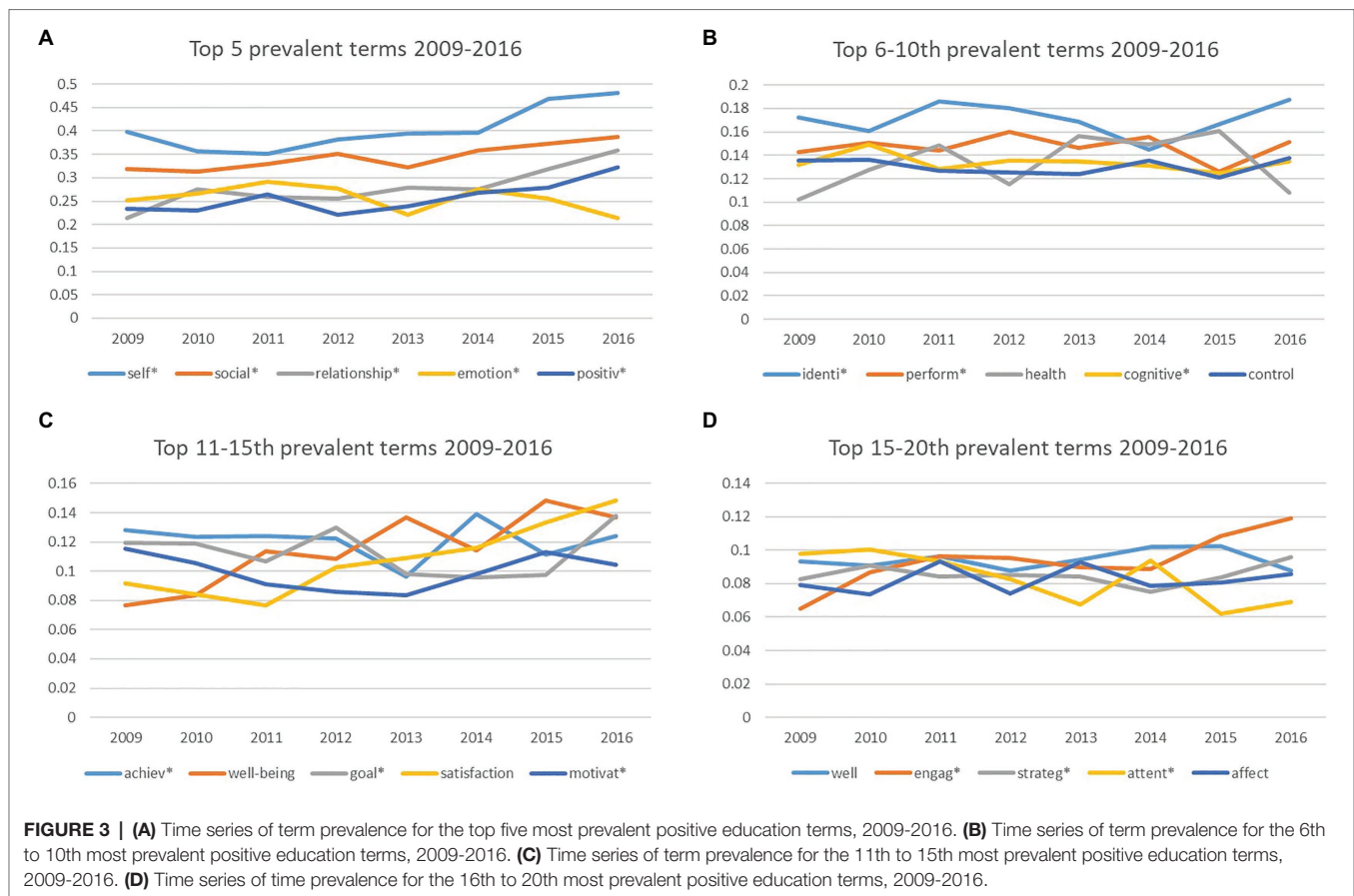


FIGURE 2 | (A) Time series of term prevalence for the top five most prevalent positive education terms, 1950–2008. **(B)** Time series of term prevalence for the 6th to 10th most prevalent positive education terms, 1950–2008. **(C)** Time series of term prevalence for the 11th to 15th most prevalent positive education terms, 1950–2008. **(D)** Time series of term prevalence for the 16th to 20th most prevalent positive education terms, 1950–2008.

highest prevalence of positive dictionary terms. Five coders then read and identified key research design characteristics in 2,805 abstracts that were confirmed as positive education (2,078

abstracts that focused exclusively on positive topics + 727 studies that involved both positive and deficit-oriented concepts). The research team coded the following: type of paper, research



paradigm, design used, tools utilized, samples, research site, research focus, and broad themes.⁷

With regard to the type of positive education paper, the majority were empirical studies (86.3 percent) followed by theoretical papers (12.4 percent), review papers (0.8 percent), policy analysis (<0.3 percent) and “other” (0.2 percent). Within the empirical studies, the dominant paradigm was quantitative (94.9 percent), with 1.8 percent qualitative and 3.3 percent mixed paradigm (i.e., quantitative and qualitative). There was a variety of research tools used to collect data within the empirical studies, as shown in **Figure 4**. The three most frequently used tools in positive education from 1950 onwards are self-report, standardized testing, and other-report.

Within the quantitative studies, 88.8 percent were classified as observational, generally correlational studies, where variables were measured and analyzed without researchers attempting to make a change (e.g., an intervention condition). The vast

majority of empirical studies were identified as cross-sectional (82.4 percent) with data collected only at a single time point; 26.12 percent were identified as longitudinal designs with data collected more than once; and 8.5 percent were coded as having both a single time point and longitudinal component to the design (some abstracts reported multiple substudies). A wide variety of longitudinal data collection time periods and waves were reported, spanning from a minimum of 1 month to multi-year studies spanning the full age period of adolescence. Intervention designs accounted for 11.3 percent of the empirical studies, and within the category of intervention studies, 36.3 percent collected pre-test and post-test data while 40.3 percent included only post-test data.

Continuing with the analysis of quantitative studies, we sought to explore the broad areas that positive education studies were focusing on. As can be seen in **Figure 5**, the two most frequent areas of focus in correlational studies were student characteristics (e.g., student motivation, emotional intelligence, self-efficacy, self-esteem, adaptive development, mental illness symptoms, life satisfaction, and coping style) and student learning outcomes (e.g., academic grades, academic self-efficacy, academic goal orientation, engagement, and satisfaction with school). The two most frequent areas of focus for intervention research were student characteristics (e.g., evaluating whether strengths use goes up following an intervention; testing if an intervention can make students more mindful) and curriculum (e.g., assessing

⁷As outlined in the “Materials and Methods” section, the abstracts selected for part 2 of the data analysis were those identified with the highest prevalence of positive education terms. To identify common trends in how positive education research has been conducted since 1950, it was important to ensure the data set represented the abstracts that had the highest prevalence of positive education terms rather than the abstracts that had fewer positive education terms. If the research had more funding, it would have been interesting to also code the lowest 2,000 abstracts to see whether there were differences in research paradigms, designs and so on compared to the abstracts high on positive education.

the outcomes of a well-being curriculum). School culture, school policy, pedagogy and government policy were underrepresented areas of focus.

Across all papers, students made up the largest sample group (96.5 percent), followed by teachers/school staff (5.0 percent) and parents (3.6 percent) (note: these percentages add up to more than 100% because some studies doubled up on samples, for example a study that included students and parents). Within the studies using student samples, sample sizes ranged from one to 50,000,000 (mode=90; median=1,025; mean=128,035±177,894.8). Age ranged from birth to age 20 (mean=14.19±6.38; only two studies were from birth, one from birth to 54 months of age, another from birth to sixth grade), and gender was roughly even (52.96 female; please note: data on nonbinary and trans categories were not provided in the abstracts).

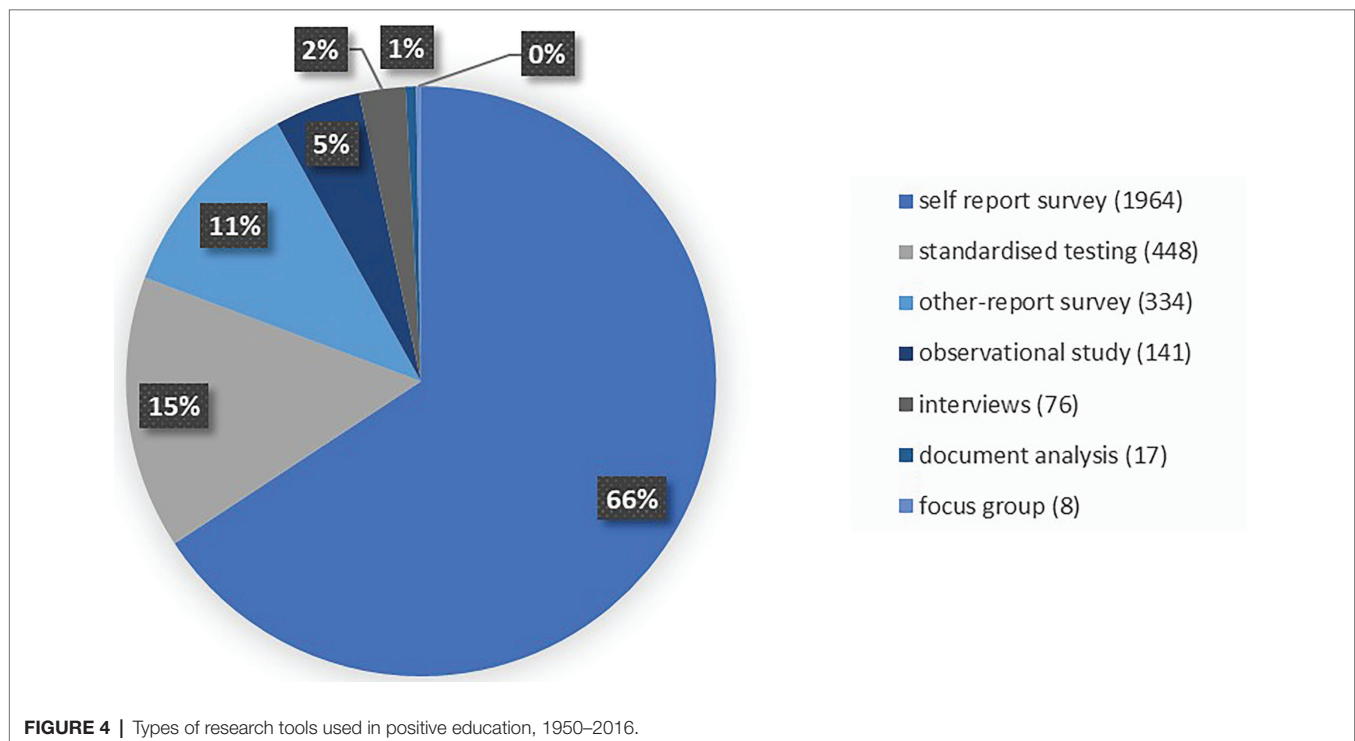
Many abstracts reported a year level as proxy for age. These were coded using the following categories: early learning (ages 0–5), primary (ages 5–12), secondary (ages 13–18), higher education (18+, college/university students), and post-secondary (16+, vocational education and training/apprenticeships/adult education). The results of these categories are presented in **Table 5**.

Abstracts were also coded by whether the students formed an integral part of the study (e.g., a targeted student intervention; a study that was specifically looking at the role of positive education in certain age groups; a study examining positive education variables in specific student samples, e.g., students on the spectrum) or whether the students were used merely as a convenience sample. Notably, 843 of the 2,805 abstracts (40 percent) were classified as positive education through the

initial filtering process because they studied positive constructs with student samples, but upon human coding, these studies were deemed to be convenience samples because the only educational aspect was the fact that the participants were students. Regardless of whether the sample was targeted or convenient, there is a paucity of research in early learning and post-secondary sector students (adult education, vocational education). As seen in **Table 5**, the predominance of studies was conducted in higher education (35.76 percent) and secondary schools (33.25 percent) for both the targeted and convenience samples.

Abstracts very rarely identified the school sector or type of school, but where that information was provided, three education sectors were identified: public/government schools were most frequent (0.9 percent), followed by public/independent (0.2 percent) and faith-based schools (0.1 percent). The studies using targeted school students were done in a variety of settings, including the classroom (90 percent), sports field (5 percent), after-school programs (3 percent), and the playground (2 percent).

For the final aspect of the human-coded sample, the two authors of this review paper (who also formed part of the team of five coders) conducted a thematic analysis on all the variables identified in the quantitative empirical studies (3,349 variables total). Due to the very large number of unique variables, a subsample of the most common variables was thematically analyzed to enable exploration of broad areas of focus that have occupied positive education research attention. Thematic analysis of the human-coded data set extends and complements the computer-generated linguistic analysis done on the top 20 positive education terms in the



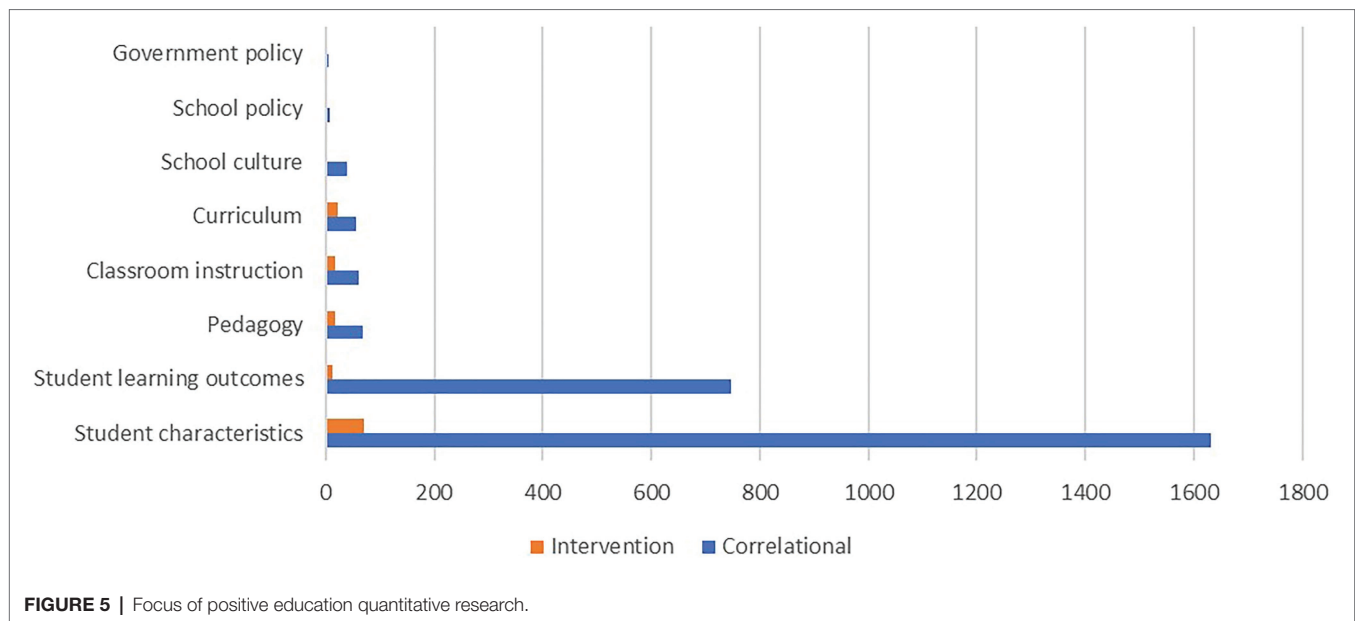


TABLE 5 | Types of student samples studied from 1950 onwards in positive education.

Educational level	Overall sample (%)	Targeted sample (%)	Convenience sample (%)
Early learning	7.34	5.87	1.47
Primary	23.02	19.04	3.99
Secondary	33.25	25.33	7.92
Higher education	35.76	20.82	14.94
Post-secondary	0.63	0.47	0.16

Percentage denominator is all studies that reported an educational stage.

larger data set. Thematic analysis involved grouping similar variables together into broader themes (e.g., “self-esteem” and “domain-specific self-esteem”; or “teacher instruction” and “teacher instruction of behaviors”). Nine broad themes were identified: positive functioning; well-being; ill-being; strengths; connection and belonging; agency; identity and personality; school climate and outcomes; and demographics. **Table 6** lists the nine broad themes and provides examples of variables that were placed within each category together with the relative percentage of the themes present in the research since 1950. The three most common themes that have been studied in positive education are school climate and outcomes; identity and personality; and agency. The role of demographics in positive education together with the theme of connection and belonging were the two themes with the lowest percentages.

The coding rubric asked coders to identify variables as either correlates (no directionality specified), predictor variables (e.g., used as independent variables), or outcome variables (e.g., used as dependent variables), where possible. Interesting trends can be seen in **Table 7**, including the fact that school climate and outcomes, identity and personality, agency, connection and belonging, and demographic variables were more likely to

be used as predictors in positive education research than as correlates or outcome measures. Positive functioning and ill-being were more likely to be used as outcome variables. Strengths were more likely to be studied as correlates, while well-being had an equal percentage use as a correlate and an outcome.

DISCUSSION

Summary of Main Findings

Student mental health has become a priority for many schools across the globe (Seligman and Adler, 2018) and is featured as an explicit goal in educational policy endorsed by key international associations, including WHO, UNICEF, UNESCO, and OECD (WHO et al., 2000; WHO, 2013; OECD, 2015; UNESCO, 2015; WHO and UNESCO, 2021). The COVID-19 crisis has further heightened the importance for schools to find ways to protect and build the mental health of students (WHO, 2020), faculty, and staff given the sharp rise in youth psychopathology (Guo et al., 2020; Marques de Miranda et al., 2020) and teacher stress resulting from the global pandemic (Alves et al., 2020; MacIntyre et al., 2020).

To successfully embed mental health approaches in schools, a robust evidence base is required. Thankfully, this topic has received more than a century of scholarly research. While research into student mental health was initially concerned with the remediation of illness, disorders, and problem behaviors in targeted student samples (Peterson and Park, 2003), the focus has expanded over the decades to also include universal approaches for all students that adopted a prevention orientation in the 1980s and 1990s (Herman et al., 2004) and school-wide initiatives that have adopted a promotion orientation from the 2000s onwards (Waters, 2011).

The advent of PP in the late 1990s has had a valuable input into reshaping remediation approaches, informing

prevention approaches, and designing promotion approaches (Shankland and Rosset, 2016; Chodkiewicz and Boyle, 2017). Additionally, PP research has been used to expand the focus beyond students to also include faculty and staff in schools (Kern et al., 2014) and to investigate broader organizational-level approaches that can help schools to create positive systems in classrooms (Allison et al., 2020) and become positive institutions (Waters et al., 2012; Waters and White, 2015). In the current paper, we have included all these approaches within the umbrella term of positive education, and we have argued that education-based mental health research that is positively oriented has existed well before the official launch of the field of positive education in 2009 (Seligman et al., 2009).

This long-standing research history and large evidence base is an asset to schools who are seeking to embed mental health approaches and wish to do so in science-informed ways. An exploration of the large research corpus also provides important information to contemporary positive education researchers about what has been studied and what gaps remain. However, the sheer magnitude of published studies over the past century can make the field difficult to navigate. This is where review papers become valuable because they provide researchers and practitioners with synthesized findings from the field.

Following the official launch of positive education in 2009 (Seligman et al., 2009), 17 review papers have been published that have focused on positively oriented outcomes. These papers have provided important findings and guidance to the field. However, as argued by Chodkiewicz and Boyle (2017, p. 72), “there have been only a limited number of *comprehensive* large-scale reviews to date” (added emphasis). The existing reviews lack comprehensiveness in a number of ways. First, because the vast majority of the existing reviews focused exclusively on intervention studies, information about other types of research designs (e.g., cross-sectional and longitudinal) and inclusion of theory and policy papers is missing. Second, given the small sample sizes drawn upon in the existing positive education reviews – for example, 75 percent contained less than 100 studies; 65 percent contained less than 50 studies; and 41 percent contained less than 20 studies – trends about the larger research patterns have not yet been presented. Third, given that the existing reviews utilized relatively short timelines (the majority of reviews looking at time periods of 10 years or less), an understanding of research patterns over longer time frames has not occurred. Finally, the focus of these reviews on single topics and/or a small number of preset topics (constituting 83 percent of the review papers) has resulted in a restricted view of the full scope of positive education research. These gaps have motivated the current “big picture” review study.

We sought to provide a large-scale and long-term “bird’s-eye” view of positive education using significantly bigger samples than prior education reviews (n for 1904–2016 = 74,496; n for 1950–2008 = 50,938; n for 2009–2016 = 17,703) over a time frame that is markedly longer than prior reviews (i.e., 112 years). We opted not to focus on preset topics but instead used the data to identify what topics of study have been the most predominant from the 1950s onwards. Furthermore, we cast a broad net to ensure inclusivity of a large range of

TABLE 6 | Thematic categories studied in quantitative positive education research.

Theme	Exemplar variables	%
Positive functioning	Adaptive development, adjustment to life educational stage, coping style	12.28
Well-being	Positive affect, life satisfaction, happiness, well-being	8.77
Ill-being	Negative affect, aggression, psychopathology symptoms, most commonly anxiety, depression and distress	10.53
Strengths	Persistence, self-regulation, optimism, hope	8.77
Connection and belonging	Parental style, parenting quality, emotional intelligence, empathy	5.26
Agency	Self-efficacy, autonomy, attribution style	14.04
Identity and personality	Self-esteem, Big Five personality factors, attachment style	17.54
School climate and outcomes	Academic achievement, assessment results, cognitive tests, autonomy-supportive teaching, learning goal orientations	17.54
Demographics	Age, gender, stage of education	5.26

TABLE 7 | Thematic categories classified as correlates, predictor variables, or outcome measures.

Theme	Correlates	Predictor	Outcome
	% of top 20 variables		
Positive functioning	5.26	10.53	15.79
Well-being	21.05	0.00	21.05
Ill-being	10.53	0.00	26.32
Strengths	15.79	5.26	5.26
Connection and belonging	0.00	10.53	5.26
Agency	15.79	21.05	15.79
Identity and personality	21.05	26.32	5.26
School climate and learning	5.26	15.79	5.26
Demographic	5.26	10.53	0.00

education-based mental health movements. To balance the breadth of data and associated language analysis of key terms, this review also employed human coding for a more granular analysis of research paradigms, designs, tools, samples, and research sites. By balancing the breadth of language analysis with the depth of human coding, this paper provides robust new insights about *what* has been studied in positive education, and *how* the knowledge has been generated, over a large and historical data set.

The first key finding is that positive education research has existed in some form for more than a century. The start date for analysis in this review paper was 1904, and it can be seen that, even at that time, there were papers being published that contained terms coming from the positive education dictionary. This finding is consistent with Froh et al.'s (2011, p. 119) review of school psychology journals from 1963 to 2008, where they concluded that there has been “a long history of some attention to the study of adaptive and/or optimal development.”

The second key finding arising from the data set is that positive education research has had a slow but steady increase over the course of the 20th century and into the start of the 21st century. The prevalence of positive education terms in peer-reviewed articles rose from 2.9 percent in 1904 to 7.2 percent in 2016. The year 1952 is the point where positive education began to consistently account for 4 percent of research abstract content. This might be a function of the rise of humanistic psychology in the 1950s through to 1970s (Maslow, 1971). Indeed, it was in 1954 that Maslow coined the term “positive psychology” and called for researchers to study positively oriented topics and human potential (Maslow, 1954).

The next notable shift occurred in 1982 when the prevalence of positive education began to steadily account for 5 percent of the published research abstract content. This trend aligns with the rise in the 1980s–1990s of what Kristjánsson (2012, p. 87) refers to as “adaptability psychologies,” such as coping psychology, SEL, and resilience education (Stevens and Pihl, 1983; Creemers and Tillema, 1987).

The third shift occurred in 2010 when positive education began to consistently account for 6 percent of abstract content. This increase occurred the year following the official launch of the field of positive education (Seligman et al., 2009) and was likely influenced by the rise in the 2000s of positively oriented movements in education such as values education (Nielsen, 2005), character education (Berkowitz and Bier, 2005), civics education (Cogan and Morris, 2001), positive youth development (Larson, 2000), and mindful education (Wall, 2005).

It appears that the official launch of positive education in 2009 (Seligman et al., 2009) may have functioned as a catalyst for research growth. For example, while it took 30 years for the prevalence of positive education research to jump from 4 to 5 percent (from 1952 to 1982) and 28 years for it to jump from 5 to 6 percent (1982–2010), the jump to 7 percent occurred within 5 years, in 2015, as shown in the yearly prevalence line of **Figure 1**. Of course, it could be that the 7 percent prevalence does not remain steady from this point onwards, and future data will be needed to determine whether the upward trend continues, accelerates toward an exponential trend, stabilizes, or declines. However, the fact that the yearly prevalence line consistently sits above 6.5 percent from 2010 onward, rises to above 7 percent for 2015 and 2016 and does not show any backsliding from 2009 onwards, points to the idea that the launch of positive education as a formal field has functioned as a catalyst for research growth. Further support for this idea can be seen in the review findings of Rusk and Waters (2013), who conducted a large bibliometric analysis of the broader field of PP (launched in 1999) and found in the

subsample of education journals that positive education papers had tripled.

Differences in topics studied prior to and after the official launch of positive education also point to the launch as a catalyst. Comparison of the top 20 most widespread terms from the period 1950–2008 to the period 2009–2016 shows that after the official launch of the field, four new positively oriented topics gained prominence: well-being; satisfaction; *motivat**; and *engag**. Additionally, three positively oriented terms that were being studied prior to the launch rose in prevalence and rank order after 2009: *emotion**; *health*; and *goal**. Moreover, for the positive terms that were equally ranked across both time periods, the mean prevalence was consistently higher in 2009–2016 compared to 1950–2008 (e.g., see the mean increases for *positive**, *relationship**, and *social**) showing that more research was being conducted on these positively oriented topics and that they accounted for a higher proportion of the overall literature.

Such trends point to the idea that the official launch of positive education as a field may have helped to mobilize the growth of positively oriented education research and to place attention on some of the newer PP constructs. Oades et al. (2011a), Vella-Brodick (2011), and Shankland and Rosset (2016) have also made this claim. It is important to note that the rise of new positive topics since the launch of positive education is not at the expense of some of the time-honored mental health and education research topics, such as affect, self, health, and achievement, all of which have remained predominant from the 1950s through to 2016. The ongoing research emphasis on some of these longer-term constructs led Kristjánsson (2012, p. 86) to ponder whether positive education is merely “old wine in new bottles” but it is probably more apt to think about this as an enlargement of the wine cellar that is stocked with older, more established labels and has added a new range of wines.

It is important to make clear that we do not seek to nullify earlier education movements that have been positively oriented by suggesting that the official launch of positive education has been a catalyst. We do not suggest that it has been the sole catalyst – merely that it has been a supporting factor (just as humanistic and adaptive psychologies seem to have prompted further lines of topical literature). Indeed, as stated above, the data reveal that mental health and positively oriented research in education have been around for a very long time in many different forms. We have reasoned that this research can retrospectively fall under the umbrella of positive education. In this way, we have suggested that positive education had a history before Seligman et al. (2009) labeled it. It is this history and long research momentum that set the stage for the official launch of the field by Seligman and his colleagues. Based on the rising mean prevalence of positive topics within education-oriented abstracts, this launch poised researchers to place a greater focus within scientific publications on positive education topics and widen the scope of study to new positively oriented topics. In other words, by providing a label and a mission, the official launch of positive education seems to have accelerated what already existed and triggered a greater focus and breadth of research in education-based mental health.

Stepping back to look at the big picture, one can see that the percentage of positive education research present across the 35 education, psychology, and well-being journals reviewed in the current paper is still reasonably small (7 percent), as is the mean prevalence of the top 20 terms in the field, despite the steady increases in proportion. There is still room for considerable growth in positive education and the broader impact it can have across the fields of education, psychology, and well-being.

One finding of interest was the sizeable number of constructs that have been the focus of study in the broader PP literature over the past two decades that have not yet received attention within education. Indeed, there were 37 terms from the positive education dictionary that had a mean prevalence of less than 0.001, including several of the VIA character strengths such as bravery, zest, and forgiveness (mercy). This was also the case for many terms pertaining to mindfulness (e.g., breathe, refocus, openminded, and savor), and several pro-social terms (e.g., giver, kindhearted, and psycho*social). Froh et al. (2011, p. 119) found the same results in their school psychology review and concluded that there has been “inattention to many relatively new PP constructs that have been shown to be of importance to the well-being of adults and children.”

Within the positive education areas that have been studied, the language analysis revealed what terms were most often studied. To complement this, the human coding phase of this review sorted the study variables into nine broad research themes that have been present in positive education research since 1950. Again, these results show a blend between the more established “stalwart” topics in the field, such as agency, identity, and personality with the addition of newer foci such as well-being and positive functioning. As with the language analysis that showed that pro-social constructs had low prevalence in positive education, the theme of connection and belonging was equal lowest in the human-coded results (together with demographics) suggesting that this is a fruitful area for growth in the field. Strengths is another area that came out to be reasonably low in the human-coded themes, with some strengths also featured in the terms that had a prevalence of less than 0.001 percent of the data set.

In addition to identifying *what* has been studied in the field of positive education over time, the current review paper also shed light on *how* positive education has been studied by analyzing the types of paper, research paradigms, designs, tools, samples, and research sites from 1950 onwards (human-coded sample; $n=2,805$ abstracts). Analyzing the research trends in how positive education research has been conducted, where it has been conducted and who it has been conducted with highlights gaps in the field. It also provides important information that can be used to understand the common findings as well as put caveats in place on the overarching claims being made about positive education. For example, the fact that comparatively little research has been conducted in the early learning years means that claims about the effectiveness of positive education cannot yet be extended to younger children. Additionally, the fact that the impact of demographic factors were the equal lowest area of focus in positive education, and considering that we did not find any abstracts

allowing for nonbinary gender categories, suggest that that caution is required when assuming that the general positive education findings will apply to minority groups (e.g., racial minority, gender and sexual minority, low socio-economic status, regional versus metro, and so on).

Of the types of papers published in positive education, empirical studies were by far the most common (79.5 percent) and this is consistent with the initial calls from founders in PP for the field to distinguish itself from other earlier positively oriented movements by focusing on empirical science (Seligman and Csikszentmihalyi, 2000; Peterson, 2006). Yet, the bird's eye view provided by the current analysis could be used to suggest that the pendulum has swung too far and that there is a need for more theoretical papers to help the field grow and expand. Moreover, given that review papers and policy analysis accounted for only 1 percent of the publications, there is room for growth with these two types of contributions. Of course, these results could be a reflection of the 35 journals that formed the database, and a different journal selection may have resulted in a higher proportion of theoretical, review, and policy papers being found. However, given that the vast majority of the 35 journals had been utilized by former review papers (albeit with smaller subsamples), and the well-being/PP journals were also endorsed by the five experts consulted, it is likely that these journals well represent the types of positive education papers being published. As such, the trend of few theoretical, review, and policy papers is most likely valid and, while it is somewhat expected, expansion of these methodologies may help enrich the field.

It is interesting to note that the majority of positive education review papers published since 2009 have focused on intervention studies (76 percent; see **Table 1**) and yet intervention studies only accounted for 11.3 percent of the papers published in the field. Interventions were most often conducted in the classroom (90 percent) but were also implemented in after-school programs, the playground and the sports field – the latter three indicating that positive education has a role to play in shaping the broader contexts and culture of schools beyond the classroom.

That said, context did not feature heavily as a research focus in the positive education data set. As shown in **Figure 5**, within the quantitative research, student characteristics, an individually oriented topic, were the area of focus that received the highest percentage of research in both the correlational (62.5 percent) and intervention research (49.65 percent). Student learning outcomes, another individually oriented area, received the highest percentage of research in correlational research (28.6 percent). The more contextually oriented areas of study, such as policy, culture, and classrooms, had a much lower percentage in the quantitative positive education research. These results point to a criticism that positive education is too often decontextualized (Ciarrochi et al., 2016) and supports calls to extend beyond intra-individual factors to contextual, cultural, and system factors that shape positive outcomes for individuals, groups, and institutions (Waters et al., 2015b; Roffey, 2017; Owens and Waters, 2020). Allen et al. (2016) argue that schools operate as nested systems that incorporate many levels of

influence. Ecological models suggest that context affects well-being at distal and proximal levels (Bronfenbrenner, 1977). Distal aspects of context can include school climate and school policy – both of which are pointedly underrepresented in the positive education literature in the current data set. Proximal contextual factors include the classroom environment (teacher pedagogy and instruction as well as the curricula taught in class) and significant relationships (friendships, parent-child relationships), which, again, did not feature strongly in the data set. Contextual ecological models of well-being in schools have recently received research attention (see Waters et al., 2019, 2021a; Allison et al., 2020; Kern et al., 2020), but these papers were published after 2016 and, thus, were not part of the data set used in the current paper. While the criticism of decontextualization is beginning to be addressed, more attention is needed to context in positive education.

Stepping beyond research at the individual level to investigate context and systems requires “epistemological broadening, both in terms of scope and methodologies” (Lomas et al., 2020, p. 2) particularly the use of qualitative and/or mixed-methods research approaches – both of which were scant in the positive education data set. The neglect of qualitative paradigms in positive education aligns with a criticism directed toward the broader field of PP (Hefferon et al., 2017; Lomas et al., 2020). Qualitative research opens up inductive approaches that play an important role in theory building. For example, Brunzell et al.’s (2016, 2018) qualitative study on the way teachers find meaning when working with traumatized students led to the Trauma-informed Positive Education (TIPE) model. Moreover, by asking different questions of established educational phenomena, qualitative research opens a portal to new and extended understandings of existing positive education constructs. For example, Howells’ (2014) qualitative research on gratitude in schools as an “action” expanded the existing quantitative approaches on gratitude in schools as an emotion, thereby opening the door to a wider range of action-based gratitude interventions. The field would benefit from a higher proportion of qualitative research and by using a more diverse set of research tools, such as case studies, interviews, focus groups, and document analysis (which currently only account for 7 percent of the research tools used). Other diverse methods such as Delphi studies (Elmendorf and Song, 2015), implicit approaches (Williams et al., 2017), and the use of student drawings (Waters et al., 2021b) are making their way into positive education, indicating that the field is slowly extending its boundaries beyond quantitative methods that focus on individual-level research to qualitative approaches that embrace context and greater complexity.

Study Limitations

The findings discussed above must be considered within the limitations of the current review study. To address the gaps that exist in other positive education review papers, we designed a study that used large data sets, with no predetermined topics, over very long time periods. The strength of large data sets is that of generalization, but this also presents a challenge in

how to find ways to meaningfully synthesize copious volumes of information. To trace whether positive education had grown over time and identify the most prevalent topics, computer-based language analysis was applied. This allowed a big picture view to be provided on an analysis of terms. However, the gains in breadth from language analysis are counterbalanced by the lack of detail. An abstract may have contained a term from the positive education dictionary – for example, hope – but the prevalence analysis could not tell us whether that term was the focus of the study or was more of an “incidental” or nonessential word used in the abstract. For example, it could be that the authors ended the abstract with a sentence stating that they *hoped* the research inspired future studies. To try to address this limitation, for the human coding component we filtered the data from 1950 onwards and sorted by abstracts that contained the highest proportion of positive education terms (i.e., the abstracts contained multiple positive education terms), thus reducing the risk of including abstracts that contained one-off, spurious positive education terms.

The decision to focus on the abstracts with higher numbers of positive terms was also made because the focus of the current paper was on growth in positive education. To identify common trends in how positive education research has been conducted since 1950, it was important to ensure that the data set represented the abstracts that had the highest prevalence of positive education terms rather than the abstracts that had fewer. If this project had more funding, it would have been interesting to also code the abstracts that had the lowest proportion of positive education terms to see whether there were differences in research paradigms, designs, topics, tools, settings, and so on – this set of abstracts may be examining different topics, using more varied research designs, and derive from a higher proportion of nonempirical papers.

We aimed to offset the limitations of language analysis by also conducting human coding on a relatively large sample of 2,805 abstracts. The inter-rater reliability statistics across the team of five coders was high. Human coding allowed for more detail to be identified about how positive education has been conducted since 1950. These results provided valuable information but also identified some findings that conflicted with those identified in the language analysis. For example, word count analysis showed that the terms *social** and *relationship** were among the highest terms present in the data set from 1950 onwards. Moreover, the term *social** was trending to reach 4 percent in the 2009–2016 data set. Yet, when variables identified were categorized into broader themes, the theme “connection and belonging” was the least prevalent. Term prevalence analysis results seemed to differ then from the human-coded identification of variables most studied. This shows how different subsamples within the larger data set provide unique results given that the term analysis was completed on the large LIWC data set, while the theme analysis was performed on a smaller human-coded subsample of abstracts. This also shows how the level of detail used can influence the results found and reminds the reader to consider the limitations of this review (and of other review papers) when drawing conclusions about the field.

One criticism that has been directed at educational, development, and psychology research is the over-reliance on convenience samples (Nielsen et al., 2017; Zhao, 2020). This is also the case in positive education, where 40 percent of studies using student samples coded by the research team were identified as convenience student samples rather than purposeful samples. This could certainly be seen as a limitation of the current review paper and a limitation that is reflective of the broader body of positive education and, indeed, psychological science. It also begs the question of what constitutes positive education. Is positive education any positively oriented/mental health research that includes student samples or must it use a purposeful student sample that occurs within educational contexts?

Finally, as already outlined, the data set of journals used may be considered a limitation. The choice to use selected journals rather than a science database (e.g., PsychLIT, or ERIC, Web of Science) was made because the topic – positive education – straddles the intersection between two broad fields and, thus, the use of selected journals allowed for a more targeted database. We followed the protocol of other researchers who had conducted reviews on positive education by using selected journals to form the database (Durlak et al., 2011; Froh et al., 2011; Kristjánsson, 2012; Taylor et al., 2017), and we double-checked the list of 35 journals with five experts in the field. However, if we had selected different journals, the results may have changed. This brings us back to the point of making methodological decisions that allowed for insights to come from a very large data set while not making the data so large that it is unmanageable. Along similar lines, the analysis focused on abstracts rather than the full papers to allow for manageability. Using the full paper may have generated higher term prevalences for **Figure 1** and would have shown a higher proportion of terms. Thus, by using only the abstracts, the growth statistics calculated in this review are likely to be a conservative estimate. It could also be that using the full papers may have generated a different list of the top 20 terms. However, we reasoned that it is the abstracts that provide the most focused text of the paper and, thus, provide the most accessible and succinct view of what the study is researching.

These findings also add to calls for researchers to report studies comprehensively and succinctly in abstracts. A recent review benchmarked the completeness of randomized controlled trials (RCTs) in oncology abstracts against Consolidated Standards of Reporting Trials (CONSORT) reporting requirements (Sivendran et al., 2015) and found they included a median of nine of 17 key details, with certain features with excellent coverage (eligibility criteria, interventions, endpoints), and others more poorly represented (trial design description, blinding, registration). We were unable to find an equivalent to Sivendran et al.'s (2015) benchmarking review paper that has performed an analysis of abstract completeness

in the fields of PP or education, but it would be fair to say that there were abstracts in the current data set that were not fully comprehensive, and this may have shaped the findings we obtained. As such, we call for researchers in positive education to be as comprehensive as possible in their future publications. As noted by Sivendran et al. (2015), this is critical given that abstracts are often publicly available where full manuscripts are not and, as such, are likely to inform evidence-based practice.

CONCLUSION

Positive education has great potential to improve the lives of students and others involved in education systems, in its aim to foster capacities needed to maintain mental health promote and well-being across the lifespan. The long-term presence of research in this field together with its more recent growth, both in size and breadth, has contributed much knowledge. The current review shows that positive education research is indeed growing. However, our findings also suggest that this growth is limited in some respects by a lack of diversity in certain paradigms, research designs, samples, methods, and settings. This large-scale review identified certain “blind spots” in positive education research, such as an over-reliance on observational, cross-sectional, self-report survey designs with high school and university students (often using convenience samples) and a relative absence of research in the early years and primary-aged students. Future positive education researchers are advised to consider the unique potential contribution to knowledge by using studies that are intervention-based with longitudinal designs and that are undertaken with purposeful samples. Moreover, qualitative research and studies that investigate context and systems in positive education will help to expand the field.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

LW and DL worked together on this paper in a 50/50 contribution, co-designed the methodology, and worked on multiple drafts of the full and final paper. LW conceived of the idea for a large scale bibliometric review of the field of positive education and led the introduction and discussion section. DL led the data management, statistical analysis and results section of the paper. All authors contributed to the article and approved the submitted version.

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Nursing Students' Emotional State and Perceived Competence During the COVID-19 Pandemic: The Vital Role of Teacher and Peer Support

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Background: The COVID-19 pandemic has led to the shutdown of society and created sudden and long-lasting changes in teaching practices, forcing many nursing students to study remotely at home. These students' relatedness with their teachers and peers has been limited and mainly online. Several studies have indicated that students' emotional states and mental health have been negatively affected by the pandemic, representing a serious challenge for many countries. Because they use only digital tools, online students have perceived a decline in teacher and peer support. Likewise, these students have reported feelings of sadness, loneliness, anxiety, and stress, affecting their learning and competence development.

Aims: To investigate the associations between peer support, teacher support, emotional state, and perceived competence in nursing students during the pandemic.

Methods: This cross-sectional study collected quantitative survey data from 329 nursing students at a large university in Norway. Structural equation modeling (SEM) was used to test seven associations among peer support, teacher support, emotional state, and perceived competence.

Results: Teacher support had a significant direct effect on perceived competence, while peer support almost had a significant direct effect. However, the emotional state was directly affected by peer support and had a direct impact on perceived competence. Hence, teacher and peer support is important to nursing students' perceived competence.

Conclusion: During the COVID-19 pandemic, both peer and teacher support can significantly support students' competence development. Therefore, students should utilize the support of their teachers and peers in a structured manner to bolster their competence development.

Keywords: COVID-19 pandemic, digital learning, teacher support, peer support, perceived competence, emotional state

INTRODUCTION

Globally, the COVID-19 pandemic has led to the shutdown of societies and created sudden and long-lasting changes in universities' teaching practices: universities have closed their campuses, and much teaching has been online. Regardless of the subject and country, all university students have been impacted. Research indicates that students' emotional states and mental health have been negatively affected by the pandemic situation. Crucially, rates of depression, anxiety, sadness, and loneliness have increased among young university students (e.g., Islam et al., 2020; Kaparounaki et al., 2020; Loades et al., 2020; Commodari et al., 2021; Idoiaga Mondragon et al., 2021; Kakuchi, 2021; Sivertsen, 2021; Suresh et al., 2021). The proportion of Norwegian university students struggling with serious mental illness has increased from 32% in 2018 to 45% in 2021. Likewise, the proportion of students longing for company with others (e.g., feeling excluded or isolated) has increased from 30% in 2018 to 54% in 2021 (Sivertsen, 2021). Studies on nursing students have reported similar results (Labrague et al., 2020; Gao et al., 2021; Miao et al., 2021; Patelarou et al., 2021).

Moreover, recent studies indicate that nursing students' perceived stress and anxiety have increased in response to the pandemic; for example, many nursing students are worried about the risk of infection (Aslan and Pekince, 2020; Savitsky et al., 2020; Fitzgerald and Konrad, 2021). Registered nurses (RNs) and nursing students have experienced severe stress caused by increased work schedules (Gómez-Ibáñez et al., 2020; Shaukat et al., 2020). Conversely, during their nursing education, many students have part-time jobs at the hospital, nursing home, etc., alongside their studies, which contributes to necessary income. However, due to COVID-19 restrictions, many nursing students have had to stop their part-time work, which subsequently has led to economic uncertainty (Gómez-Ibáñez et al., 2020; Swift et al., 2020). In addition, nursing students' stress and anxiety levels have been influenced by worries about completing their programs on time, handling new software and applications, dealing with academic workloads (e.g., new assignments), and receiving online assessments in response to lockdowns and new restrictions (Gallego-Gómez et al., 2020; Swift et al., 2020; Amerson et al., 2021; Fitzgerald and Konrad, 2021).

Although the pandemic has impacted all university students, this study focused solely on nursing students. Nursing students are particularly vulnerable to the pandemic, signifying the need for support. First, studies indicate that clinical training is a highly stressful component in nursing curricula (e.g., Shaban et al., 2012; Alzayyat and Al-Gamal, 2014). In contrast to other university studies, 50% of nursing education comprises clinical studies; that is, nursing students work at different hospital wards and in the municipality health care, including nursing homes, etc., requiring close contact with vulnerable individuals. During the pandemic, this is still the case. Accordingly, these students are more prone than the general student body to being infected by the virus, spreading it, and unwillingly being a reason for another person's illness and potential death. It is rational that young, inexperienced students find this situation stressful and concerning. Second, nursing students' educational

situations during the pandemic have been extraordinary; while accomplishing their educational demands, they have also been prone to being infected, accompanied by the anxiety of spreading the virus to their patients, family, and friends. In this demanding situation, their clinical competence has been assessed and graded as pass or fail by their clinical study. Moreover, since the campuses worldwide have periodically been closed, nursing students' have had limited access to simulation centers to practice their clinical skills. Plausibly, this embodies a sense of intensified pressure and tension. Third, previous research highlights that nursing students generally report high stress levels (Alzayyat and Al-Gamal, 2016; Labrague et al., 2017) and higher stress levels than other health students (Stecker, 2004), as well as the general student population (Barlett et al., 2016).

During the COVID-19 pandemic, nursing students' relatedness with their teachers and peers has been limited and mainly digital; teachers worldwide have made extensive use of digital teaching tools (Daniela and Visvizi, 2021). Hence, both perceived teacher and peer support have declined. Over the decades, the literature has provided strong evidence that support from teachers and peers is essential for students' motivation, adaptive learning strategies, perceived competence, mental health, and wellness (e.g., Wentzel, 2009, 2017; Federici and Skaalvik, 2014; Ryan and Deci, 2017; Suresh et al., 2021). During the COVID-19 pandemic, the literature identified social support as a protective factor against loneliness among nursing students (Labrague et al., 2020). Moreover, nursing students who reported good or excellent teacher support showed fewer symptoms of anxiety and stress and were less concerned about being on track to graduate compared to students reporting poor teacher support. In addition, students with peer support were likelier to approve of their teacher's response and approach to their education (Fitzgerald and Konrad, 2021). In this context, this study evaluates how perceived teacher and peer support relate to nursing students' emotional states and perceived competence.

Typically, studies on support in educational settings target emotional and instrumental support (Semmer et al., 2008; Wentzel, 2009; Federici and Skaalvik, 2014). Emotional support is characterized by empathy, friendliness, respect, encouragement, and caring, whereas instrumental support is typified by tangible support. For instance, when teachers provide guidance, they can also provide instrumental support by helping their students understand the content or manage technical issues (Federici and Skaalvik, 2014; Skaalvik and Skaalvik, 2015). Students' perceptions of emotional support relate to their feelings of belonging, relatedness, and connectedness (e.g., Ryan and Deci, 2017). For instance, Fedesco et al. (2019) measured students' sense of belonging and relatedness using items that assessed their sense of being accepted and appreciated by their teachers and peers. In this study, we used two subscales of peer relatedness and teacher relatedness to measure nursing students' sense of relatedness.

Fedesco et al. (2019) showed that teacher relatedness was the most predictive factor of college students' interest in the course and self-reported effort. Conversely, peer relatedness did not significantly predict any outcome variables. Similarly, Beachboard et al. (2011) explored how learning communities

improve higher education learning outcomes and found that relatedness with peers and faculty was a strong predictor of academic development and job preparation. In addition, Ebert et al. (2019) identified the importance of developing a sense of connectedness in both on- and off-campus learning for nursing and midwifery students. They found that a sense of connectedness with academic staff positively influenced students' socialization and learning. Moreover, participants expressed a preference to learn from those with whom they had formed connections and relationships and a concern about the increase in online teaching. Nursing students experienced a diminished sense of connectedness due to an overreliance on self-directed learning undertaken in isolation from their peers and teachers.

While relatedness is concerned with how students feel when they interrelate with their teachers and peers, instrumental support typically addresses students' perceptions of being provided with instrumental resources and adequate practical help (Skaalvik and Skaalvik, 2015). Instrumental aspects are characterized by tangible support. Therefore, nurturing and action-facilitating support may be distinguished from each other (Semmer et al., 2008; Federici and Skaalvik, 2014). To assess peer guidance and teacher guidance, we adapted two subscales of instrumental support developed by Federici and Skaalvik (2014). Research has shown that motivational constructs significantly, directly, or indirectly relate to nurturing students' relatedness and instrumental aspects, such as help with practical problems and direction on how to perform different tasks. Instrumental support demonstrated the strongest relationship with students' motivation and predicted lower levels of anxiety (Federici and Skaalvik, 2014). Furthermore, Lee et al. (2021) focused on graduate nursing students and showed that peer support, including subscales of both peer relatedness and guidance, was positively related to emotions of positive achievement and learning satisfaction and negatively associated with negative emotions. In addition, positive emotions were positively related to learning satisfaction, whereas negative emotions were negatively associated with learning satisfaction.

Finally, perceived competence is essential for students to reach their educational goals. Within self-determination theory (SDT), perceived competence, autonomy, and relatedness are assumed to be the three fundamental psychological needs. With respect to an activity or domain, the sense or perception of being competent is important because it facilitates an individual's goal attainment and provides them with a sense of need satisfaction from engaging in an activity at which they feel effective. Numerous studies have demonstrated that basic psychological needs satisfaction significantly relates to human well-being and wellness (Deci and Ryan, 2000; Ryan and Deci, 2017).

In summary, being a nursing student is usually stressful with or without a global pandemic (Stecker, 2004; Alzayyat and Al-Gamal, 2016; Barlett et al., 2016; Labrague et al., 2017; Amerson et al., 2021; Fitzgerald and Konrad, 2021). On a global scale, however, the pandemic has introduced new types of challenges affecting students' emotional states, mental health, and learning. Due to the extensive use of digital tools, perceived teacher and peer support has declined. Critically, nursing students have experienced sadness, loneliness, anxiety, and stress, harming

their emotional state, well-being, learning, and competence development. At the same time, the healthcare system in many countries, including Norway, has a shortage of registered nurses. The fourth wave of COVID-19 intensified the ongoing crisis and led to burnout for many nurses. As a result, a considerable number of nurses are resigning (Falatah, 2021; NSI Nursing Solutions, 2021). Consequently, in light of the aging population globally, the COVID-19 pandemic, and possibly new pandemics, finding ways to encourage and support young people to complete their nursing education is significant. Therefore, this study focuses on nursing students' perceived competence in relation to emotional state and perceived teacher and peer support.

Aims

Hence, by using structural equation modeling (SEM), this study aims to provide novel knowledge about nursing students' perceived competence, their emotional state, and their perceived teacher and peer support. The research questions are as follows:

1. Does perceived teacher and peer support directly affect nursing students' perceived competence?
2. Does perceived teacher and peer support indirectly affect nursing students' perceived competence due to the mediation of their emotional state?

Based on the theoretical and empirical knowledge of the associations between perceived competence, emotional state, and perceived teacher and peer support, we hypothesized that support by a teacher (Wentzel, 2009, 2017; Skaalvik and Skaalvik, 2015; Ryan and Deci, 2017) would directly and indirectly affect nursing students' perceived competence (H_1 and H_6), highlighting the importance of relatedness, practical help, and guidance. Furthermore, in this specific situation, while teaching was digital, the teachers aimed to set students together in different learning teams collaborating on their learning. Accordingly, it is plausible that students supported each other's learning by caring about each other, establishing friendships, and helping to solve technical problems (Wentzel, 2009, 2017; Skaalvik and Skaalvik, 2015; Ryan and Deci, 2017), all of which affected nursing students' perceived competence (H_2 and H_7). Based on SDT theory (Ryan and Deci, 2017), we also hypothesized a positive direct effect of teacher and peer support on nursing students' emotional state (H_4 and H_5). However, we do not know how this works when teaching becomes primarily digital. Finally, the students' handling of stress, loneliness, sadness, and anxiety will have better conditions for learning and thereby experience perceived competence (H_3). Hence, we proposed the following hypotheses, which are portrayed in **Figure 1**:

1. *Hypothesis 1 (H_1):* Teacher support directly affects perceived competence.
2. *Hypothesis 2 (H_2):* Peer support directly affects perceived competence.
3. *Hypothesis 3 (H_3):* Emotional state directly affects perceived competence.
4. *Hypothesis 4 (H_4):* Teacher support directly affects students' emotional states.
5. *Hypothesis 5 (H_5):* Peer support directly affects students' emotional states.

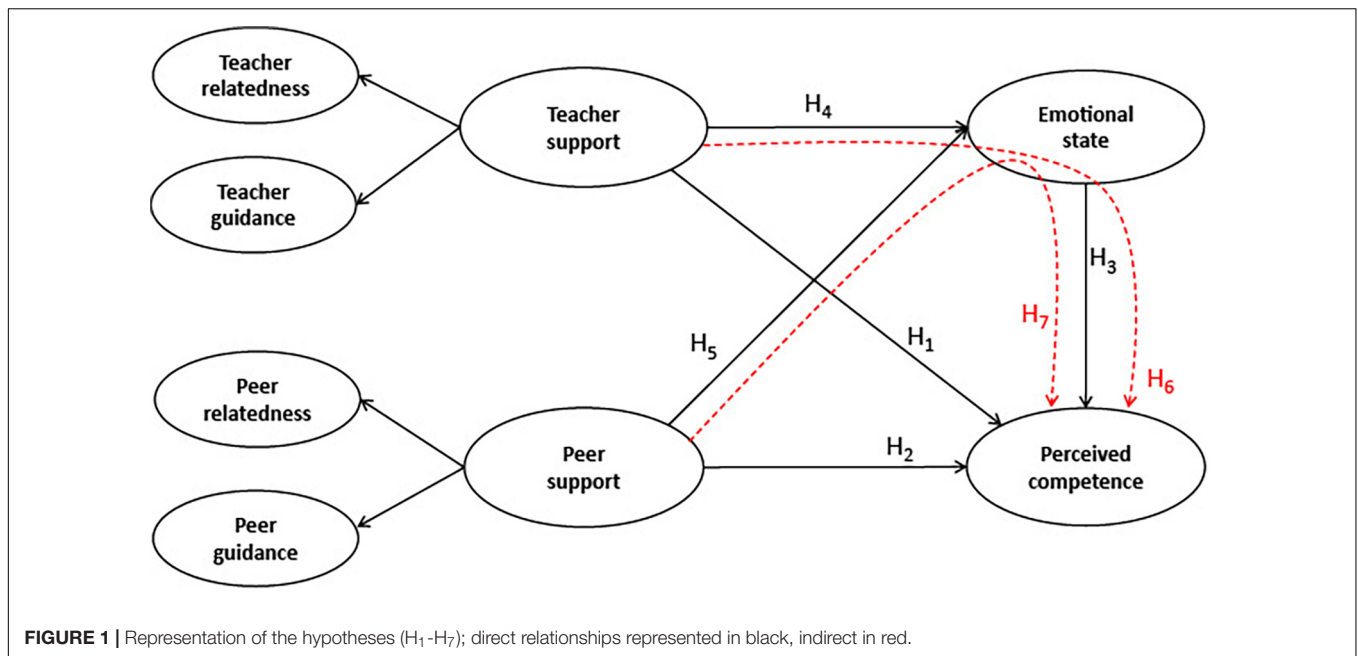


FIGURE 1 | Representation of the hypotheses (H₁-H₇); direct relationships represented in black, indirect in red.

- 6. *Hypothesis 6 (H₆)*: Teacher support indirectly affects perceived competence.
- 7. *Hypothesis 7 (H₇)*: Peer support indirectly affects perceived competence.

- (2) peer support (including peer relatedness and peer guidance),
- (3) emotional state, and (4) perceived competence.

MATERIALS AND METHODS

Participants and Procedure

This study is part of a wider Norwegian study on nursing education that focused on student-active learning methods and students’ study effort, emotional state, motivation, and perceived competence. The wider study included the nursing education program at a large university in Norway, and the university’s management unit gave permission to conduct it. In spring 2020, this cross-sectional study collected survey data on all nursing students, including first-, second-, and third-year students. In autumn 2020, all new first-year students were invited to participate in the survey. The inclusion criteria were thus (1) all nursing students at the actual university and (2) those willing to participate. There were no exclusion criteria.

All nursing students received information about the study via e-mail and announcements on their learning platform (Blackboard), with three reminders to participate. In total, 329 students responded to an online questionnaire. All participation was voluntary, guaranteed to be anonymous, and not compensated. The total sample contained 329 (37%) out of 883 viable students. Missing data were handled listwise, giving an effective sample of 305 students.

Measures

The scales were included and assessed in the following order: (1) teacher support (including relatedness and guidance subscales),

Teacher Support

Teacher support consists of two subconcepts, teacher relatedness and teacher guidance. The subconcept of teacher relatedness was assessed using five items from the Adapted Basic Satisfaction Needs at Work scale (Fedesco et al., 2019). This scale reflects the level of connection that students experience in their interactions with their nursing teachers. Teacher relatedness is characterized by empathy, friendliness, affiliation, and caring, all of which are recognized as important requirements for a sense of belonging, relatedness, and connectedness (Deci and Ryan, 2000; Ryan and Deci, 2017). The items for teacher relatedness included “I get along with the teachers in the course” and “The teachers in the course care about me.” A previous study reported a Cronbach’s alpha of 0.86 for teacher relatedness (Fedesco et al., 2019).

The teacher guidance subscale featured three items on instrumental support (Wentzel, 2009; Federici and Skaalvik, 2014). Federici and Skaalvik (2014) developed and validated an instrumental support measurement that we adapted to the context of homebound nursing teaching. In the present study, we determined the tangible support that teachers and peers can provide in a digital environment. The items for teacher guidance included “The teachers help me so that I understand what I should focus on in the actual course” and “When technical problems emerge, the teachers help me solve them.”

Peer Support

Two subscales on peer relatedness and peer guidance examined peer support. The peer relatedness subscale contained five items from the Adapted Basic Satisfaction Needs at Work scale (Fedesco et al., 2019). Items for peer relatedness included “I get along with the peers in the course” and “The teachers in the course

care about me.” A previous study reported a Cronbach’s alpha of 0.80 for peer relatedness (Fedesco et al., 2019). The peer guidance subscale featured three items on instrumental support (Federici and Skaalvik, 2014) that were adapted for this study. Items for peer guidance included “*The students help me so that I understand what I should focus on in the actual course*” and “*When technical problems emerge, the students help me solve them.*”

Emotional State

This study developed four items to assess students’ emotional states, measuring whether they agreed with different statements concerning their emotional states. The items included “*I have felt more stressed than before*” and “*I have felt sadder than before.*”

Perceived Competence

Finally, perceived competence was measured with three items from the Perceived Competence for Learning scale (Center for Self-Determination Theory, 2021). The items are concerned with feelings or perceptions of competence with respect to an activity or domain. In this study, the activity or domain was nursing education during the COVID-19 pandemic. The items included “*I feel confident in my ability to learn the materials in the course*” and “*I am able to achieve my goals in the course.*” The perceived competence for the learning scale has high internal consistency, with an alpha measure of 0.80 (Williams and Deci, 1996). All response categories were accompanied by a seven-point scale that ranged from “*Absolutely disagree*” (1) to “*Absolutely agree*” (7) with a midpoint of “*Neither*” (4). **Appendix Table 1** demonstrates the concepts and their indicators, along with some additional values (i.e., mean, standard deviation, skewness, and kurtosis).

Statistical Analysis

The data were analyzed with descriptive statistics using IBM SPSS version 27 (SPSS, 2021). The respective hypothesized relations between the latent variables of teacher support, peer support, students’ emotional states, and perceived competence were tested with a structural support model (SEM) using Stata 17 (StataCorp, 2021).

Research has indicated that Cronbach’s α cannot be generally trusted as an estimator of reliability (Raykov, 2001). Thus, as shown in **Tables 1, 2**, composite reliability was estimated using the formula developed by Hair et al. (2010). Thus, a coefficient ≥ 0.7 was sufficient for both reliability coefficients. For the correlation analyses, the p -value was set to 1%. Estimates based on SEM analyses commonly include both 5% and 1% p -values. Factor loadings < 0.32 were poor, ≥ 0.45 fair, ≥ 0.55 good, ≥ 0.63 very good, and > 0.71 excellent (Schermelleh-Engel et al., 2003).

Model Fit

Since the standard errors were estimated under non-normality, the Satorra-Bentler-scaled chi-squared statistic was applied as a goodness-of-fit statistic. It represents the correct asymptotic mean even under non-normality (Jöreskog et al., 2016). In line with the rule of thumb of the conventional cut-off criteria, the following fit indices were used: the chi-square statistic (χ^2) such that a small χ^2 and a non-significant p -value correspond to a

TABLE 1 | Measurement models for the first- and second-order factor models of teacher and peer support.

Items	Parameter	Satorra-Bentler coef ^a	t-value	Bentler-Raykov squared multiple correlation ^b (R^2)	Composite reliability ^d (ρ_c)
Teacher relatedness					
Teach_rel1	$\lambda_{1,1}$	0.82	33.44**	0.68	0.89
Teach_rel2	$\lambda_{2,1}$	0.91	52.42**	0.83	
Teach_rel3	$\lambda_{3,1}$	0.82	34.98**	0.68	
Teacher guidance					
Teach_guid1	$\lambda_{4,2}$	0.86	32.02**	0.74	0.83
Teach_guid2	$\lambda_{5,2}$	0.77	23.35**	0.59	
Teach_guid3	$\lambda_{6,2}$	0.74	23.25**	0.54	
Teacher support					
Teach_rel	$\gamma_{1,1}$	0.95	20.69**	0.89	0.91
Teach_guid	$\gamma_{2,1}$	0.89	15.46**	0.78	
Peer relatedness					
Peer_rel1	$\lambda_{7,3}$	0.86	48.06**	0.80	0.92
Peer_rel2	$\lambda_{8,3}$	0.91	48.01**	0.83	
Peer_rel3	$\lambda_{9,3}$	0.89	40.77**	0.74	
Peer guidance					
Peer_guid1	$\lambda_{10,4}$	0.74	18.43**	0.55	0.84
Peer_guid2	$\lambda_{11,4}$	0.90	29.60**	0.80	
Peer_guid3	$\lambda_{12,4}$	0.75	17.74**	0.57	
Peer support					
Peer_rel	$\gamma_{3,2}$	0.86	20.62**	0.73	0.78
Peer_guid	$\gamma_{4,2}$	0.75	10.69**	0.56	
T_sup-P_sup ^c	$\varphi_{1,2}$	0.41	6.24**		

** p -value < 0.01 .

^aSatorra Bentler completely standardized factor loadings.

^bThe Bentler-Raykov squared multiple correlation coefficient: R^2 .

^cThe covariance between the second-order teacher support and peer support latent constructs.

^dComposite reliability $\rho_c = \frac{(\sum \lambda)^2}{(\sum \lambda)^2 + \sum(\theta)}$.

good fit; χ^2 /degrees of freedom such that a value ≤ 2 indicates a good fit and ≤ 3 an acceptable fit; and the root mean square error of approximation (RMSEA) and the standardized root mean square residual (SRMS) such that values < 0.05 indicate a good fit, whereas values < 0.08 are acceptable. In addition, the comparative fit index (CFI) and the Tucker Lewis index (TLI) were applied, with acceptable fits at 0.95 and 0.90, respectively, and good fits at 0.97 and 0.95 and above (Schermelleh-Engel et al., 2003).

RESULTS

Among the 305 students, 266 were female (87%), and 39 were male (13%). Moreover, 179 students were in their first year of study (59%), 48 in their second year (16%), and 78 in their third year (26%). **Table 3** presents the means (M), standard deviations (SD), Cronbach’s α , and Pearson’s correlation matrix of the latent variables included in the SEM. The correlations between the latent variables ranged from -0.25 to 0.71 in the expected

TABLE 2 | Measurement models for students' emotional state and perceived competence.

Items	Parameter	Satorra-Bentler coef ^a	t-value	Bentler-Raykov squared multiple correlation ^b (R ²)	Composite reliability ^e (ρ _c)
Emotional state					
Emot1	λ _{1,1}	0.58	6.81**	0.33	0.80
Emot2	λ _{2,1}	0.63	7.26**	0.40	
Emot3	λ _{3,1}	0.62	5.97**	0.39	
Emot4	λ _{4,1}	0.78	6.85**	0.61	
Perceived competence					
Perc_comp1	λ _{5,2}	0.85	28.71**	0.72	0.90
Perc_comp2	λ _{6,2}	0.88	35.60**	0.78	
Perc_comp3	λ _{7,2}	0.87	35.26**	0.76	
Emot1_Emot2 ^c	θ ₈	0.65	9.92**		
Emot3_Emot4	θ ₉	0.54	4.07**		
Emotional state- Perceived competence ^d	ψ _{1,2}	-0.31	-4.05**		

**p-value < 0.01.

^aSatorra Bentler completely standardized factor loadings.

^bThe Bentler-Raykov squared multiple correlation coefficient: R².

^cThe covariances between the error terms for Item 1 (stress) with Item 2 (anxiety) and Item 3 (loneliness) with Item 4 (sadness), respectively.

^dThe covariance between the emotional state and perceived competence factors.

^eComposite reliability ρ_c = $\frac{(\sum \lambda)^2}{(\sum \lambda)^2 + \sum \theta}$.

direction. The α-levels for the various measures indicated a good level of inter-item consistency, with Cronbach's alpha coefficients ranging from 0.82 to 0.91.

Moreover, we investigated how teacher and peer support related to nursing students' emotional states and perceived competence and the inter-relatedness between the two dependent latent variables (emotional states and perceived competence). For this purpose, we estimated two complete measurement models of 12 items (the independent variables) and seven items (the dependent variables). The models were tested with confirmatory factor analysis (CFA) using Stata 17 (StataCorp, 2021).

The Measurement Models

The first measurement model included 12 items representing teacher relatedness (three items), teacher guidance (items), peer relatedness (three items), and peer guidance (three

items) (Table 1). Previous studies have suggested a strong correlation between teachers' emotional and instrumental support (Federici and Skaalvik, 2014; Morin, 2020). The current study found a strong correlation between teacher relatedness and guidance (r = 0.71). Thus, we tested whether teacher support and peer support could be treated as two-dimensional constructs that fit into a second-order factor model.

The second-order measurement model largely revealed a good fit (χ² = 100.12, p = 0.000, df = 50, χ²/df = 2.06, RMSEA = 0.057, p-close = 0.011, CFI = 0.97, TLI = 0.97, SRMR = 0.147). The standardized factor loadings were significant, ranging from 0.74 to 0.91 for the first-order loadings and from 0.75 to 0.95 for the second-order loadings, all significant at the 1% level (p < 0.01). Composite reliability (ρ_c) was good for all concepts, ranging from 0.78 to 0.92. However, several significant residuals were ≥ 1.96 (63.6%), which emphasized the need for specification. Several significant residuals appeared between the teacher relatedness items and peer relatedness items; the same occurred for the teacher and peer guidance items. Nine of the highest residuals appeared between the three items on teacher guidance and three items on peer guidance, ranging from 3.74 to 5.11. Thus, we included a covariance between the second-order teacher and peer support factors, showing a good fit (χ² = 75.53, p = 0.009, df = 49, χ²/df = 1.54, RMSEA = 0.042, p-close = 0.331, CFI = 0.98, TLI = 0.98, SRMR = 0.031).

Initially, the measurement model on emotional state (four items) and perceived competence (three items) had a poor fit (χ² = 194.91, p = 0.000, df = 13, χ²/df = 15.0, RMSEA = 0.213, p-close = 0.000, CFI = 0.85, TLI = 0.75, SRMR = 0.098). The standardized factor loadings were significant, ranging from 0.50 to 0.89 (p < 0.01). The composite reliability (ρ_c) was good for emotional state (ρ_c = 0.80) and perceived competence (ρ_c = 0.90). However, some extremely high modification indices indicated misspecification. Hence, a covariance between the "Emotional state1 (stress)" and "Emotional state2 (anxiety)" items (MI = 159.0) as well as the "Emotional state3 (loneliness)" and "Emotional state4 (sadness)" items (MI = 154.3) would considerably improve the measurement model. The inter-item correlations between these pairs of items were 0.77 and 0.76, respectively. Thus, we allowed two correlated error covariances, resulting in values of 0.65 and 0.54, respectively, to considerably improve the fit (χ² = 13.55, p = 0.259, df = 11, χ²/df = 1.15, RMSEA = 0.027, p-close = 0.723, CFI = 0.99, TLI = 0.99, SRMR = 0.018). Table 2 contains the factor loadings, t-values, R²-values, and

TABLE 3 | The mean, Cronbach's alpha, and correlation coefficients of the study variables.

Construct	Mean (SD)	Items	Cronbach's alpha	1	2	3	4	5	6
1. Perceived competence	4.50 (1.29)	3	0.90	1					
2. Teacher relatedness	3.98 (1.45)	3	0.89	0.39**	1				
3. Teacher guidance	4.13 (1.37)	3	0.84	0.39**	0.71**	1			
4. Peer relatedness	5.46 (1.31)	3	0.91	0.29**	0.23**	0.25**	1		
5. Peer guidance	5.65 (1.13)	3	0.84	0.21**	0.26**	0.33**	0.56**	1	
6. Emotional state	4.43 (1.45)	4	0.82	-0.25**	-0.15**	-0.14*	-0.21**	-0.13*	1

*p-value < 0.05, **p-value < 0.01. Listwise N = 305, Missing N = 24 (7%).

ρ_c -values of the measurement model, including covariances for two correlated error terms.

The Structural Model

As shown in **Figure 2**, we used SEM to represent the measurement models with factor loadings, structural regression coefficients, explained variance in the endogenous latent variables, and fit indices.

The SEM yielded a good fit ($\chi^2 = 161.49, p = 0.103, df = 140, \chi^2/df = 1.2, RMSEA = 0.022, pclose = 0.996, CFI = 0.99, TLI = 0.99, SRMR = 0.038$). **Table 4** shows the standardized regression coefficients of the direct, indirect (mediated), and total effects between the latent variables.

As displayed in **Figure 2** and **Table 4**, significant directional paths appeared from teacher support to perceived competence ($H_1: \gamma_{2,1} = 0.38^{**}$) and from emotional state to perceived competence ($H_3: \beta_{2,1} = -0.17^*$). The direct path from peer support to perceived competence was almost significant ($H_2: \gamma_{2,2} = 0.14, t = 1.80$). The same result occurred for the path from teacher support to emotional state ($H_4: \gamma_{1,1} = -0.15, t = -1.69$). However, the direct path from peer support to emotional state was significant ($H_5: \gamma_{1,2} = -0.20^*$), indicating that low peer support was related to higher levels of stress, anxiety, and loneliness.

Looking at the indirect effects, teacher support barely impacted the perceived competence mediated by emotional state ($H_6: 0.03$). Thus, the indirect effect was poor and not significant. The total effect of teacher support on perceived competence was strong and appeared directly through relatedness and adequate practical guidance. Finally, peer support related significantly,

directly, and indirectly, to the perceived competence that was mediated by the emotional state. The total effect of peer support had a significant positive total effect on perceived competence, even if its direct and indirect effects were not significant ($H_7: 0.03$).

DISCUSSION

Teacher and peer support is important to all university students. During the COVID-19 pandemic, nursing students have experienced increased stress, anxiety, worrying, and several health problems signifying a specific vulnerability, which have necessitated encouragement and support (Aslan and Pekince, 2020; Labrague et al., 2020; Savitsky et al., 2020; Fitzgerald and Konrad, 2021; Patelarou et al., 2021). Simultaneously, to avoid shortages of registered nurses, ensuring that these students complete their education and develop the required competence is crucial. Subsequently, it is fundamental to gain knowledge on how to certify nursing students' learning and competence development in the midst of a pandemic. Therefore, this study investigated the associations between nursing students' perceived competence, their emotional state, and perceived teacher and peer support.

Consequently, this study contributes to a holistic perspective that seeks to support the emotional well-being of and competence development in nursing students in three ways: (1) it supplies empirical knowledge to the growing body of emotional and instrumental support literature by exploring nursing students' experiences of teacher and peer support; (2) it provides empirical

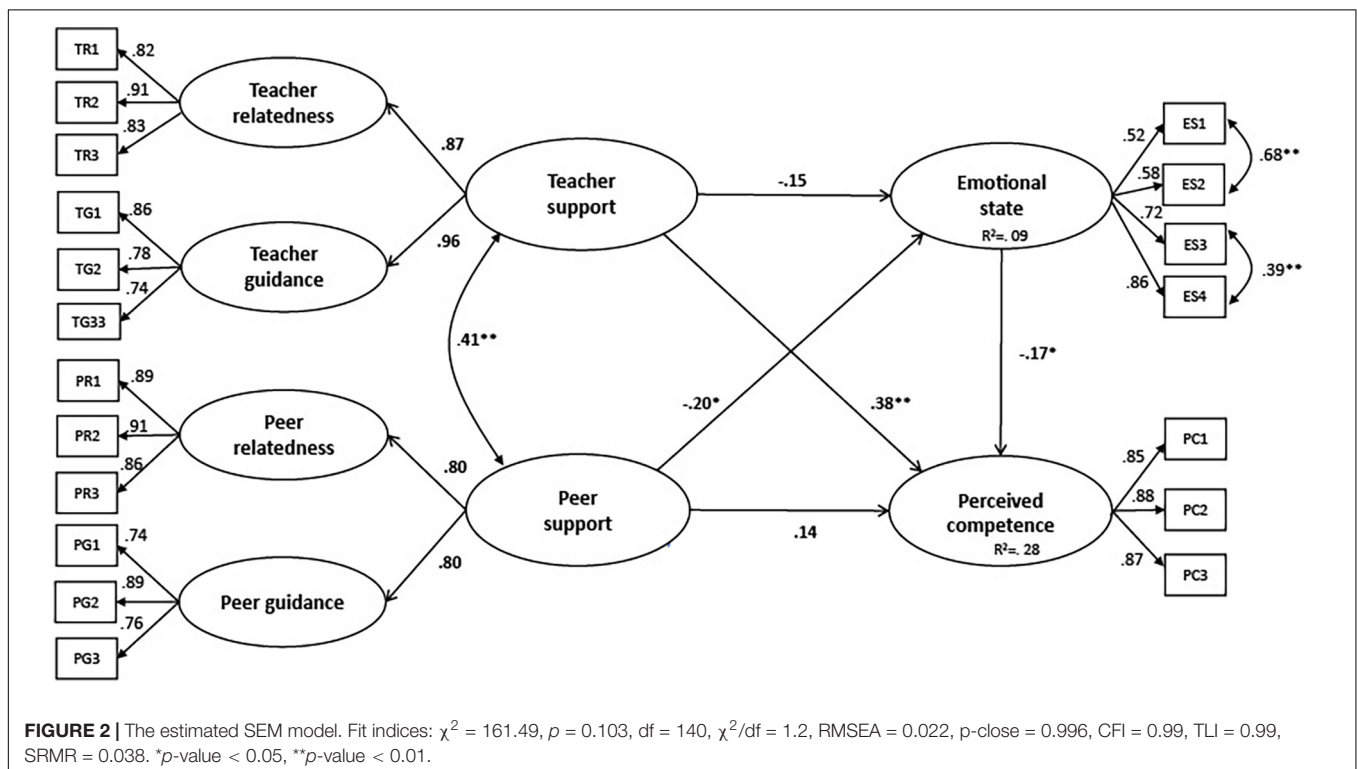


TABLE 4 | SEM model: direct and indirect relationships between teacher and peer support, emotional state, and perceived competence.

Constructs	Hypothesis	Direct effects		Hypothesis	Indirect effects		Total effects	
	Parameter	Estimate	t-value		Estimate	t-value	Estimate	t-value
Perc_competence								
Teach_support	^a $\gamma_{2,1}$ (H ₁)	0.38**	4.91	(H ₆)	0.03	1.39	0.40**	5.31
Peer_support	$\gamma_{2,2}$ (H ₂)	0.14	1.80	(H ₇)	0.03	1.12	0.17**	5.83
Emotional state	^b $\beta_{2,1}$ (H ₃)	-0.17*	-2.42				-0.17*	-2.42
Emotional state								
Teach_support	$\gamma_{1,1}$ (H ₄)	-0.15	-1.69				-0.15	-1.69
Peer_support	$\gamma_{1,2}$ (H ₅)	-0.20*	-2.05				-0.20*	-2.05

p*-value < 0.05, *p*-value < 0.01.

^aGamma (γ): standardized regression coefficients representing direct relationships between the independent (teacher and peer support) and dependent (emotional state and perceived learning) latent constructs.

^bBeta (β): standardized regression coefficients representing direct relationships between the dependent latent constructs.

insights into the associations between teacher and peer support, emotional state, and perceived competence among nursing students; and (3) it leverages advanced statistical analysis and applies SEM. Based on the results, this study recommends that nursing students should be supported with strategies to promote their emotional well-being and perceived competence during pandemics.

More specifically, this study tested seven hypotheses and found support for three of them (H₁, H₃, and H₅). The results supported the hypothesized relationships between teacher support and students' perceived competence (H₁), students' emotional state and their perceived competence (H₃), and peer support and students' emotional state (H₅). Moreover, the hypothesized relationship between peer support and perceived competence (H₂) as well as the association between teacher support and emotional state (H₄) were both close to significant. While assessing the insignificant indirect effects (H₆ and H₇), we determined that the total effect of both types of support was important to nursing students' perceived competence (Table 4). Accordingly, we propose that teacher and peer support should be improved to facilitate nursing competence and the completion of nursing education.

Experiences of Teacher and Peer Support When Teaching Becomes Digital

Peer support had the highest mean scores, demonstrating its significance for nursing students' emotional states. When technical problems emerged, instrumental support was especially important and was mostly provided by peers. Hence, the results indicate that the students found support for each other. Amerson et al. (2021) explored mental health among nursing students during a period of virtual learning and showed that students may need to innovate to deal with new assignments that also require new software and applications. Likewise, they noted that the learning time associated with multiple new platforms and software may significantly increase students' anxiety and stress. We propose that students may find it easier to ask their peers for help with technical problems than their teachers. Moreover, students may direct technological questions to their

peers because they perceive them to be more technologically competent than their nursing teachers. A lack of teacher support and knowledge of technological solutions in teaching can trigger students to seek support from each other. Therefore, nursing teachers should facilitate and help students connect, encouraging them to assist each other. This is especially important among first-year students, for whom much information is new; getting to know fellow students, the learning platform, teaching methods, and the clinical work, along with moving to a new city, might be overwhelming. The faculty may involve and organize second- and third-year students in supporting the young students in creating a nurturing and flourishing learning environment. Moreover, the faculty needs to facilitate and support nursing teachers in improving their digital competencies and thus being able to support and guide students as needed.

The students also reported that their peers helped them understand the educational content and directed them to perform different tasks. The pandemic has resulted in the extensive use of digital learning tools, both in theoretical and practical studies. When teaching becomes digital, students may feel insecure about asking their teacher questions, seeking explanations, and requesting guidance. In addition, teachers are digitally present for only a limited time, so students must send a message when they have a request. Moreover, some teachers may digitally observe the practical studies of their students, while their peers may be physically present in the ward. As a result, teacher relatedness can suffer, making peer relatedness and guidance vital. Consequently, teachers must be available for online guidance concerning both theoretical and clinical studies. Likewise, providing students with clear and easily accessible information about how to reach teachers is principal. Furthermore, it is important to introduce the structure and functionality of the learning platform to ensure that students find necessary information, learning material, assignments, etc., feeling self-reliant while using the platform.

Although peer support showed the highest mean score, teacher support was directly and significantly related to perceived competence. Previous research has confirmed that teacher support is essential to students' motivation, learning, and

competence development (Federici and Skaalvik, 2014; Ryan and Deci, 2017). Regarding teacher relatedness, this study determined a mean score in the indecisive range. Evidently, several students felt that they did not have a close relationship with their teacher or that their teacher cared about them. Moreover, the means of teacher guidance were low or indecisive. It is plausible that these students found it difficult to build a vital relationship with the teacher when their education went digital. However, we expected teacher guidance to be stronger, especially for items covering guidance on different work requirements (e.g., written submission, internship assignment, and bachelor's thesis) and understanding the subject matter.

The results suggest that it was difficult to foster a good learning environment in online classrooms with large student groups. Some students might have found it uncomfortable or even scary to speak loudly in a digital session, while 100–250 others listened. Consequently, these students may not have engaged in questions or reflections, impeding the dialogue. Such issues are reflective of an insecure learning situation that can decrease students' perceived competence. To prevent students from having unanswered questions and ambiguities at the end of online lectures, teachers can encourage students to extend their stay in the digital room. Teachers can also organize students into smaller groups (e.g., breakout rooms), creating structures for social contact and learning. Furthermore, teachers should encourage students to work together in learning communities and care about each other. Creating reference groups of students and collecting information about students' experiences concerning the different courses can give valuable feedback. When knowing about challenges or problems, it is easier to provide specific support and implement measures. Even though digital teaching may trigger students to feel unnoticed and inundated; digital teaching has come to stay. Thus, supportive strategies and structures should be developed to enhance students' empowerment and facilitate their autonomous functionality in the clinic.

In this study, nursing students did not significantly differentiate between instrumental and emotional support. Although there is a clear theoretical and logical distinction between emotional and instrumental support, the literature has similarly demonstrated that students do not clearly distinguish between them. For example, Federici and Skaalvik (2014) and Morin (2020) found correlations of 0.80 and 0.68, respectively, between teachers' emotional and instrumental support. This study found a correlation of 0.71, which indicates that supportive teachers tended to be supportive in several ways. This finding suggests that the students who received good instrumental support, thus helping them understand the subject matter, perceived their teachers as emotionally supportive as well. The same patterns appeared for peer support. Thus, by providing support, regardless of whether the support is emotional or instrumental, teachers can promote students' competence development and thereby learning.

Finally, we found a strong correlation between teacher and peer support. When we included covariance between the second-order teacher and peer support latent constructs, this considerably improved the model fit. Students who yearn for support may look for support from both teachers and students.

That is, they desire support regardless of who provides it. By supporting student connections, teachers can contribute to a learning environment characterized by support, respect, and care. Ebert et al. (2019) disclosed that nursing and midwifery students preferred learning from those with whom they had formed connections and relationships in both on- and off-campus learning contexts. Aspirations for support might be largely based on relationships rather than on the provider's role or title.

Relationships Between Teacher and Peer Support, Perceived Competence, and Emotional State

Concerning perceived competence, about 50% of the nursing students in this study reported that they coped well with the pandemic, whereas about 50% claimed that they did not. Teacher and peer support were vital. In particular, the latter was crucial to the students' emotional states, which affected their perceived competence and probably their perceived learning as well. The emotional support provided by the teachers affected the students' perceived competence, mediated by their emotional state.

Research has shown that nursing students report the highest stress levels compared to students in other formalized programs (Stecker, 2004; Barlett et al., 2016). Moreover, nursing students are mostly young women. Both before and during the pandemic, studies have disclosed higher anxiety levels and higher stress levels among female nursing students compared to male nursing students (Aslan and Pekince, 2020; Savitsky et al., 2020). Recently, Gallego-Gómez et al. (2020) revealed a deteriorated self-concept and higher uncertainty among female nursing students. Moreover, young people reported that they experienced more loneliness during the mandatory lockdown, with women having higher odds of loneliness (Labrague et al., 2020; Sivertsen, 2021).

The pandemic has possibly worsened nursing students' sense of stress, anxiety, loneliness, and sadness. As shown in our study, numerous students (46.8–64.6%) reported that they were more stressed (64.6%), anxious (51.5%), lonely (58.6%), and sad (46.8%) during the pandemic than before, which has negatively influenced their learning and competence development. In this light, peer support seems especially important to students' emotional states and thereby their learning and perceived competence. This supports the findings of other recent studies among nursing students amid the pandemic (Morin, 2020; Lee et al., 2021).

Prior to the pandemic, nursing students in general reported higher levels of stress and anxiety compared to the overall student body (Barlett et al., 2016; Labrague et al., 2017), inclusive of other health education programs (Stecker, 2004). The nursing program aims to prepare nursing students for professional nursing roles, enhancing their critical thinking and decision-making skills in clinical settings. This clinical component represents about 50% of nursing education and includes demanding learning situations, producing high levels of discomfort, stress, and anxiety (Stecker, 2004; Alzayyat and Al-Gamal, 2016; Labrague et al., 2017). Evidently, the role of a nursing student seems to be quite stressful, representing a special state of vulnerability that calls for further attention and support. The students who coped well with the study situation during the pandemic possibly experienced

closer relationships with their peers and teachers than those who struggled. Thus, this support should be recognized as a resource that promotes mental health and learning among nursing students (Labrague et al., 2020). Crucially, students should receive both emotional and instrumental support strategies to bolster their mental health, their competence development, and the completion of their education, which also benefits society (Fitzgerald and Konrad, 2021).

Relatedness, perceived competence, and autonomy—basic human needs as defined by SDT theory—were impaired among nursing students during the pandemic (Deci and Ryan, 2000; Ryan and Deci, 2017). Specifically, peer relatedness was extensively reduced. Combined with reduced teacher–student interaction, this may have caused loneliness, insecurity, anxiety, sadness, and symptoms of depression. These negative emotional states decreased their perceived competence and amplified their fears of not learning what should be learned and thus failing exams and tests. Autonomy also decreased among students. In a situation characterized by stress, uncertainty, worries, loneliness, and several societal restrictions, they found it difficult to achieve a sense of acting autonomously. Ultimately, this study supports numerous others who have pointed out the importance of both teacher and peer support to students' perceived competence, mental health, and well-being (e.g., Wentzel, 2009, 2017; Federici and Skaalvik, 2014; Ryan and Deci, 2017; Fitzgerald and Konrad, 2021; Suresh et al., 2021). Therefore, this study encourages the implementation of support strategies.

Strengths and Limitations

A notable strength of this study is its empirical examination of associations that have not been previously tested. Building on a strong theoretical foundation with questionnaires in possession of good psychometric properties, this study expanded on previous studies by testing the associations between teacher and peer support, emotional state, and perceived competence among nursing students with SEM. This modeling technique accounts for random measurement errors, and the psychometric properties of the scales in the model were derived accurately. The SEM model included 19 items, requiring a sample of $n \geq 200$. The listwise sample included 305 cases, representing a large sample (Brown, 2006; Hair et al., 2010). Missing values were infrequent.

Nevertheless, the findings of this study must be discussed, with some limitations in mind. First, the information input to the estimated SEM increases with more indicators per latent variable and more sample observations (Westland, 2010). Applying the three-indicator rule (Hair et al., 2010), the latent variables in the model were measured with only three and four indicators. However, the factor loadings were strong, supporting reliability. Despite a good fit, some alternative models might fit the data better or be more accurate. Regardless, the fit indices and composite reliability underpin the present results. We encountered no problems with discriminant and convergent validity. We found good factor loadings, indicating that the theoretical plausibility was good. All paths correspond well to the theoretical basis, which supports the findings. Second, the present sample included fewer men than women, reflecting the gender composition of the nursing student population in Norway. Moreover, first-year students

were double as many as students in the second and third study years; plausibly, first-year students may experience a stronger need for teacher support than second- and third-year students. Third, the cross-sectional design did not allow us to determine causality. A longitudinal design would have allowed for changes to be assessed and compared over time. Fourth, the use of self-reported data carries a certain risk of the findings being based on common-method variance (Podsakoff et al., 2003).

CONCLUSION

Nursing students must deal with high demands for theoretical learning and clinical competence development. The COVID-19 pandemic has utterly increased stress, worries, and uncertainty. This study found that teacher and peer support are remarkably significant to nursing students' emotional states and perceived competence. Correspondingly, we conclude that teacher and peer support represent principal pedagogic resources that enhance both mental health and competence development among nursing students; compatibly, this manuscript suggests several pedagogical strategies. Furthermore, we encourage teachers to be attentive in identifying strategies to enhance teacher and peer support in nursing education, particularly in the context of a pandemic.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Ethical review and approval was not required for this study because the ethical authorities in Norway state that when using NETTskjema (<https://nettskjema.no/?lang=en>) all ethical requirements are fulfilled. No ethical approval by an ethics committee was needed. No sensitive information is collected in this study. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

BU undertook the analyses and wrote the results section along with the introduction section. GH wrote the discussion section and the conclusion. TP and HT collected the data, gave feedback to the manuscript several times. All authors contributed to the drafts of the various sections of this article. All authors approved the submitted version.

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APPENDIX

APPENDIX TABLE 1 | The measurement items and their relevant values (mean, standard deviation, skewness, and kurtosis).

Concepts	Item	Mean	SD	Skewness	Kurtosis
Teacher relatedness	I get along with the teachers in the course.	4.18	1.46	-0.284	-0.382
	The teachers in the course care about me.	4.25	1.67	-0.350	-0.814
	I am close to the teachers in the course.	3.51	1.68	0.204	-0.993
Teacher guidance	The teachers help me so that i understand what i should focus on in the actual course.	4.41	1.60	0.383	-0.742
	When i work with different requirements (e.g., written submission, internship assignment, or bachelor thesis), the teachers direct me in how to perform the different tasks.	4.27	1.58	-0.263	-0.760
	When technical problems emerge, the teachers help me solve them.	3.70	1.56	-0.005	-0.506
Peer relatedness	I get along with the students in the course.	5.65	1.29	-1.510	2.554
	The students in the course care about me.	5.46	1.36	-1.152	1.233
	I am close to the students in the course.	5.28	1.61	-1.102	0.368
Peer guidance	The students help me so that i understand what i should focus on in the actual course.	5.69	1.36	-1.496	2.277
	When i work with different requirements (e.g., written submission, internship assignment, or bachelor thesis), the students direct me in how to perform the different tasks.	5.53	1.32	-1.194	1.482
	When technical problems emerge, the students help me solve them.	5.72	1.20	-1.439	3.031
Emotional state	During the pandemic.				
	I have felt more stressed than before.	4.77	1.70	-0.592	-0.577
	I have felt more anxious than before.	4.34	1.72	-0.292	-0.887
	I have felt lonelier than before.	4.47	1.89	-0.353	0.140
Perceived competence	I have felt sadder than before.	4.13	1.85	-0.157	1.173
	I feel confident in my ability to learn the material in this course.	4.50	1.43	-0.394	-0.566
	I am capable of learning the material in this course.	4.44	1.39	-0.362	-0.534
	I am able to achieve my goals in this course.	4.57	1.41	-0.580	-0.420



Working Online During COVID-19: Accounts of First Year Students Experiences and Well-Being

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The sudden move to online learning due to the COVID-19 pandemic has created an influx of epistemological, psycho-social, emotional and financial challenges for first year students. Lecturers and academics had to find creative and sustainable ways of ensuring that all students were epistemologically included. New policies and practices were introduced rapidly at universities to facilitate the unavoidable move to online learning. As initial teacher educators at a public University in South Africa we noted that the sudden move to working online has presented various challenges to first year students' overall well-being which has further exacerbated issues of exclusion and marginalization for many. We argue that it is against this backdrop that this paper explores how the move to online learning has affected first year students' overall well-being, at one teacher education institution. The Index for Inclusive Education was used as a theoretical lens to explore student's perceptions of the institution's policy, teaching and learning practices, and the institutional culture during this period. One hundred and eighty-seven purposively selected first year students participated in this qualitative, phenomenological research study. Data were collected by means of open-ended questionnaires. Responses were categorized by means of an emergent thematic analysis. The findings indicated that online learning compromised various aspects of well-being including physical, emotional, psycho-social and financial well-being for many students. The experiences of online learning and impact on well-being did, however, differ across students depending on their individual contexts and circumstances indicating that considerations of well-being need to take contextual realities into account to support the well-being and learning of all. We recommend that higher education institutions prioritize the psycho-social, emotional, and financial well-being of students during the period of online learning and not just the pedagogic needs of the qualification.

Keywords: first year students, well-being, inclusion, experiences, COVID-19, epistemological needs, psycho-social, emotional

INTRODUCTION

2020 marked a year of intense upheaval for the education sector and society at large with the advent of the global COVID-19 pandemic. Countries around the world were forced into lockdown in an attempt to curb the spread of the virus. This resulted in societal and education sector upheavals. Universities internationally and locally were forced to cease contact face-to-face modes of delivery

and move rapidly to online platforms (Ali, 2020) to continue with some form of teaching and learning. This required learning institutions to reconceptualize all teaching and learning activities for 2020. In addition, ministries of education needed to rapidly develop guidelines as well as provide support to various stakeholders during this period of transition. University students were required to quickly adapt to a new mode of delivery usually under very difficult circumstances as economic and health consequences of the pandemic impacted on their family and home lives. Lecturers too were required to rapidly develop and make learning materials available on what for many were unfamiliar online platforms as they were left with no alternative (Dhawan, 2020). We note with concern, that a one-size fits all approach has been used in instances when higher education institutions have changed over to online learning (Gillett-Swan, 2017). Although most higher education institutions managed to continue with at least some form of teaching and learning online, the resulting learning experience and outcomes were not necessarily the same for all students. We are interested in exploring how these changes have affected students' wellness.

The transition from high school to university has been described as a period of "uncertainty and volatility" (Dias and Sá, 2014, p. 300) for some students. Much research has been done on the challenges that students experience during this period of transitioning. Research has focused on challenges that relate to issues of incorrect course selections, funding challenges, navigating university structures, personal circumstances, the inability to form social networks, lack of resourcefulness and inadequate pre-university education (Araque et al., 2009; Letseka et al., 2010; Ramrathan, 2013; Camelia and Nastase, 2018; Dison et al., 2019; Moosa and Langsford, 2021). Limited focus has been placed on student wellness specifically in relation to working remotely which is the mode of learning that was primarily relied upon during the COVID-19 pandemic and that continues to be used extensively given the ongoing rise and fall of infections.

University experiences should be an exciting time for new students. It should be a time that students are exposed to new ways of learning that enhance their overall state of well-being. We are not proposing that students need to be in a constant state of equilibrium. Instead, we acknowledge that for first year students to fully understand the complexities of being at university it is a natural process for them to find themselves in a state of disequilibrium. With the move to remote learning students have expressed concerns with the lack of face-to-face contact with lecturers as well as a delay in response times from lecturers (Adnan and Anwar, 2020). What is important to us is the effect this stage of disequilibrium will have on students' overall wellness and how they are able to make sense of the challenges they would experience specifically with online learning.

Promoting student wellness is an important aspect in academia in order to promote students feeling included rather than excluded and marginalized by the institution. This paper heeds the call by Nguyen (2015) that research on online learning should focus more on the next steps in online learning and move away from comparing the differences between face to face and online learning by suggesting that consideration

of next steps in online learning need to be grounded on understandings of student experiences and the impact on well-being. We argue that in a completely legitimate attempt to get 'something' online for students, considerations of inclusive policy, practice and culture to support the learning of all may have received less attention. If this is indeed the case, then it is vulnerable and marginalized students whose overall well-being may have been most severely impacted as the online learning environment promotes a certain type of engagement that may benefit some but also act as a constraint for others (Dumford and Miller, 2018).

The aim of this paper is to explore how inclusive policy, practice and culture at one public South African university supported students' wellness while learning online during emergency remote learning. As initial teacher education lecturers at the university, we consider the implications that this move had on inclusive practices in an attempt to ensure that all students including vulnerable and marginalized students were afforded epistemological access. The Index for Inclusive Education is used as a theoretical lens to guide consideration of the institutions policy, practices and the institutional culture as experienced by first year education students.

The first part of this article discusses some of the scholarly work and reports about educational experiences during the pandemic by focusing specifically on student wellness as well as the theoretical framework for the study in relation to this. We then outline what was done methodologically for the research used in this article and present data by focusing on the positive and negative impact that policy directives, teaching and learning practices and the overall university culture had on the well-being of first year university students and how this impacted on them feeling included and excluded during online learning.

LITERATURE REVIEW

Benefits and Challenges of Online Learning

There is no evidence in literature that online learning works better than face to face teaching (Pei and Wu, 2019). What has been well documented is the challenges and benefits of online learning (see Avella et al., 2016; Dumford and Miller, 2018). The benefits include "targeted course offerings, curriculum development, student learning outcomes, behavior and process, personalized learning, improved instructor performance, post-educational employment opportunities, and enhanced research in the field of education" (Avella et al., 2016, p. 13). Other benefits include time flexibility, location flexibility, immediate feedback, having access to a wider range of course which then meets the needs of a wider audience (Dhawan, 2020).

The challenges include "issues related to data tracking, collection, evaluation, analysis; lack of connection to learning sciences; optimizing learning environments, and ethical and privacy issues" (Avella et al., 2016, p. 13; Rushiella et al., 2021). Students with greater numbers of online courses indicated having "less exposure to effective teaching practices and lower quality of interactions" (Dumford and Miller, 2018,

p. 452). Online learning has proved to be challenging in underdeveloped countries like Pakistan (Adnan and Anwar, 2020) because of lack of access to the internet because of monetary issues. So too has physical access to online learning proved challenging in the South African context with what has been called the 'digital divide' across sectors of the population being thrown into a sharp spotlight. Quite apart from physical access challenges (Avella et al., 2016) access to supported, scaffolded, engaging learning experiences within this mode appear to have been uneven at best. The high cost of participating in online learning (Demuyakor, 2020) has also been noted as a challenge. Additional challenges include lack of digital literacy, cost of technology, unequal distribution of ICT infrastructure and quality of education (Dhawan, 2020). Lastly, many students were not ready to adapt to learning online (Matarirano and Gqokonqana, 2021).

Student Wellness in Higher Education Institutions

It has been argued that wellness can be linked to the broader definition of health (Baldwin et al., 2017). Wellness can be viewed as a feeling that things are going well and can continue to go well. In addition, wellness can be regarded as the belief that we have meaningful relationships and a sense of meaning and purpose (Swarbrick and Yudof, 2015). It is the feeling that one has a sense of equilibrium and gratification. Authors have argued that wellness is linked to the view that when individuals have the psychological, social and physical resources (Dodge et al., 2012, p. 230) they will attain a level of wellbeing and will be steadfast. Thus, wellness involves a sense of empowerment. As such wellness is a personally defined view that is grounded on individual's personal goals and values (Swarbrick and Yudof, 2015, p. 2).

Additionally, wellness involves a complete awareness or holistic wellness (Hettler, 1984). Holistic wellness consists of eight broad dimensions that are linked to health-related behaviors (Swarbrick and Yudof, 2015). These include Physical Wellness (e.g., diet, exercise, sleep, smoking, alcohol use, and personal hygiene), Emotional Wellness (e.g., self-identity and self-esteem), Spiritual Wellness (e.g., sense of peace and connectedness with the universe), Social Wellness (e.g., sense of community and social support), Occupational Wellness (e.g., job satisfaction), and Intellectual Wellness (e.g., creative stimulating mental activities), Environmental Wellness (e.g., access clean air, food, and water), and Financial Wellness (e.g., financial resources). Despite the number of wellness dimensions, it has been agreed by various researchers that wellness is a multidimensional, positive, and affirming concept that has enormous practical and therapeutic benefits (e.g., Horton and Snyder, 2009; Harrington, 2016; Meiselman, 2016). These various wellness dimensions form an important basis in order to fully understand how inclusive policy, practice and culture at one public South African university supported students' wellness while learning online during emergency remote learning. The one size fits all approach in the move to online learning has the potential to make students who are engaging with online learning

encounter a number of barriers with regards to full participation as compared to those who have contact sessions (Gillett-Swan, 2017). Each one of the dimensions will be discussed below.

How Online Learning Impacts on Students' Physical Wellness

Physical wellness involves the maintenance of a "healthy body, good physical health habits, good nutrition and exercise and obtaining appropriate health care" (Swarbrick and Yudof, 2015, p. 4). It is essential to promote aspects related to physical wellness within higher education in order to reduce the frequency of disease and enhances overall health (Baldwin et al., 2017) amongst students. Within a South African context students' physical wellness remains a challenge for many because of the inequality in their social and financial backgrounds. Many students look forward to being able to live on campus as this become a means for them to get access to good health services and adequate nutrition as compared to their current home contexts. It could be argued that working online has disadvantaged these students from gaining access to these facilities.

Spiritual Wellness Amidst Online Learning

Spiritual wellness involves having "meaning and purpose and a sense of balance and peace" (Swarbrick and Yudof, 2015, p. 10). Many South African first-year students carry the pride of being first-generation university students (Vincent and Hlatswayo, 2018) and as such being able to be physically on a university campus adds to their sense of purpose. Working online would require students to refocus their initial sense of spiritual wellness in order to find alternative meaning and purpose in what they are doing. In general students have had challenges with adapting to online learning (Mishra et al., 2020).

Online Learning and the Implications for Social Wellness

Social wellness involves having "relationships with friends, family, and the community, and having an interest in and concern for the needs of others and humankind" (Swarbrick and Yudof, 2015, p. 12). We know that university students place a high value on social wellness in order for them to feel included at university (Moosa and Langsford, 2021). Traditional classroom socialization has been noted as a concern from students with regards to online learning (Adnan and Anwar, 2020). Furthermore, if first-year students are unable to form social networks and integrate into university spaces they are more likely to drop out (Forbes and Wickens, 2005; Mostert and Pienaar, 2020). Working online has not afforded students with the opportunity to have face to face contact with their peers and the greater university context and has created barriers to learning for some of them (Gillett-Swan, 2017; Ferri et al., 2020). Creating a sense of an online community is vital for students to function optimally (Sun and Chen, 2016). Universities have tried various approaches to ensure that students are not left completely isolated such as synchronized lectures, online discussion forums and interactive online tutorial group engagement. Despite these noble efforts many students could not always access these platforms due to lack of resources.

Emotional Wellness During the Time of the COVID-19 Pandemic

Emotional wellness involves the “ability to express feelings, enjoy life, adjust to emotional challenges, and cope with stress and traumatic life experiences” (Swarbrick and Yudof, 2015, p. 14). The onset of the COVID-19 pandemic has brought about numerous emotional challenges for students. South Africa has consistently experienced an increase in cases of mortality due to COVID-19. Students have not been spared the emotional effects of this. In addition to dealing with the emotional challenges of the effects of the COVID-19 pandemic, students also need to find ways to structure their days to develop self-determined work schedules in order to complete all the online tasks and engagements required of them. This is the first time that the majority of South African students have had to move to a complete online mode of learning despite some having limited to no computer skills. As such many students have struggled with the challenge of having a lack of computer self-efficacy that has impacted on their satisfaction with online learning (Alqurashi, 2016). In addition, working online also demands that students have a greater realization of time management (Mishra et al., 2020) in order to structure their day effectively. In the absence of this, students will continue to feel stressed and express a sense of not being able to cope with online learning.

Intellectual Wellness and Learning Online

Intellectual wellness involves lifelong “learning, application of knowledge learned, and sharing knowledge” (Swarbrick and Yudof, 2015, p. 6). It has been noted that there is a gap between lecturers’ expectations and students’ ability to deliver expectations (Mumba et al., 2002; Brenner and Shalem, 2010). This gap has particular implications for students’ ability to adjust and function optimally to the demands of higher education. It has been noted, with concern, that there is an increase in the number of first year students who are not academically prepared for the expectations of higher education (Gabriel, 2008; Lassibille and Gómez, 2008). The lack of intellectual wellness can lead to students experiencing psycho-pedagogical challenges because of inconsistencies between the academic knowledge and skills that were prioritized at school and the expectations of university courses (Slonimsky and Shalem, 2006; Ramrathan, 2013; Camelia and Nastase, 2018; Dison et al., 2019). These challenges can more often be dealt with during contact sessions as students challenges are more likely to be identified. One is left to wonder how intellectual wellness is addressed during online learning. Intellectual wellness is also coupled with technical preparation to be able to navigate online learning spaces (Ayu, 2020).

Occupational Wellness in Relation to Remote Emergency Online Learning

Occupational wellness involves participating in “activities that provide meaning and purpose, including employment” (Swarbrick and Yudof, 2015, p. 18). In order for this to be achieved there must be a collaboration between university structures and student agency (Case et al., 2018). When students are unfamiliar with university-specific cultures and traditions (Kuh and Love, 2000) they tend to feel isolated which could

impact on their occupational wellness. Furthermore, this would impact on students’ confidence and motivation to function in online learning (Ali, 2020). Working online can induce feelings of non-belonging because students tend to be isolated which could underwrite a sudden state of disequilibrium for students. In addition, this could lead to students becoming reluctant to communicate with their lecturers and seek academic support from peer networks instead (Norodien-Fataar and Daniels, 2016). These peer networks could encompass students that they have never met face to face and this could add an additional level of complexity for first year students. As such it is imperative that students are able to engage with well-prepared lectures and tutors (Sun and Chen, 2016) and feel fully supported by them in order to enhance their occupational wellness.

Environmental Wellness and Access Online Lectures

Environmental wellness involves “being and feeling physically safe, in safe and clean surroundings, and being able to access clean air, food, and water” (Swarbrick and Yudof, 2015, p. 8). In a South African context environmental wellness will also include access to resources like electricity, shelter and access to wifi and data. It has been noted that in India for example students face specific problems like connectivity due to being in remote locations (Mishra et al., 2020). Many South African students have the same experiences. Online learning requires students to spend large amounts of time accessing various learning platforms either in asynchronous or synchronized mode. In South Africa various service providers offer cheaper data rates after hours. This becomes problematic for many students who need to participate in synchronized classes.

Financial Wellness and the Implications for Working Online

Financial wellness involves the ability to “have financial resources to meet practical needs, and a sense of control and knowledge about personal finances” (Swarbrick and Yudof, 2015, p. 16). Students’ backgrounds and their income level are some of the social challenges that has an impact on many of them with regards to integrating into university spaces (Camelia and Nastase, 2018). In South Africa financial wellness is of great concern for many university students because of the disparity in wealth. The lack of financial wellness is a common factor leading to dropout (Lassibille and Gómez, 2008; Ramrathan, 2013) of students at university. For many students in South Africa living on university campus assists to alleviate financial challenges as they have access to resources like electricity, comfortable shelter and meals. With the onset on online learning students many students have had to continue to remain home often in poverty-stricken environments. This has in many ways compromised their access to learning.

THEORETICAL FRAMEWORK

Index for Inclusive Education

South Africa has been committed to building an inclusive education and training system since 1994, developing

education laws and policies in line with this commitment. The South African Constitution provides the foundation for education policy guiding inclusive education in South Africa, such as Education White Paper 6 (Department of Education, 2001) with the intention to achieve social justice in the form of developing just, equitable education for all that is grounded in principles of human rights and dignity. This commitment to Inclusive Education in South Africa is aligned with international developments such as the Education 2030 initiative which prioritizes achieving inclusive, equitable, quality education for all (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2016). Whilst defining Inclusive Education remains challenging, with Slee (2018) reporting that there is a lack of consensus in relation to the nature, strategies and definitions of Inclusive Education; there is agreement as to the purpose of Inclusive Education to increase access to and participation in education for all. The focus on increased access and participation for all signals the shift away from a sole focus on special needs education to responsiveness to the range of diversity of all learners. This is mirrored in Education White Paper 6 (Department of Education, 2001) which adopts a social model approach rather than a medical or deficit model approach. The social model recognizes that a variety of factors both intrinsic and extrinsic including systematic factors may impact on learning. Intrinsic factors refer to factors such as physiological factors that are inherent to the individual. Extrinsic factors refer to factors such as socio-economic and systemic factors that impact on the individual. This has particular implications for the implementation of Inclusive Education, as a social model approach requires that developing an inclusive education system requires engagement with different levels of that system.

Developing inclusive practice in institutions therefore requires the institution to be considered as a system within the broader system of the society. The Index for Inclusion is a set of materials for use in schools (Booth and Ainscow, 2016) which was designed to assist with the process of developing a framework for change and action to ensure the enactment of inclusive education in schools as systems. In this study the Index for Inclusion is used to consider the selected Higher Education Institution rather than a school. The Index for Inclusion materials take schools (institution) through a process of critical reflection on policies, concepts, structures and practices (Ainscow et al., 2005) that guide the development of an action plan to enhance inclusive presence, learning and participation. Presence refers to the physical places and spaces places in which learners learn. Learning refers to the approaches and strategies used by the school (institution) to ensure that all learners are able to learn and develop. Participation refers to the recognition of diversity, concern for personal well-being and conscious decision to challenge exclusionary practices. This process is guided through a series of steps that focus attention on three dimensions namely: creating cultures, developing policies and developing inclusive practices. Each of these dimensions is comprised of specific indicators which are further clarified by a series of questions. The indicators for the creating inclusive cultures dimension include (a) building community, and (b) establishing inclusive values. These indicators signal the collaborative, participatory, supportive community necessary for inclusive education as

well as the intention to challenge discriminatory practice, address barriers to learning and enhance opportunities for full participation for all. The indicators for the dimension of producing Inclusive Policies focus on, (a) developing the school for all, and (b) organizing support for diversity. This dimension is related to developing policies within the school (institution) that support the practice of inclusion. The indicators for the evolving inclusive practices dimension focus on the practice in terms of (a) orchestrating learning, including planning for the learning of all, and (b) mobilizing resources to support the learning of all. In this article we work with the three overarching dimensions that guide inclusive practice in the Index for Inclusion and consider experiences of the institutional culture, policies and practices that supported or constrained student learning during COVID-19's online learning and the impact of these experiences on their overall well-being.

MATERIALS AND METHODS

This research used a phenomenological qualitative approach as the aim of the research was to explore and give meaning (Fouché and Schurink, 2011) to first year university students lived experiences while working online during the COVID-19 pandemic. A phenomenological approach attempts to describe a particular phenomenon by exploring it from the perspective of individuals who have experienced that phenomenon. Given that the phenomenon under investigation in this case was first year student experience of working online during the COVID-19 pandemic, the approach was best suited to enable us to collect rich, authentic data reported by first year students. All first year students from the Wits School of Education were invited to participate in this research. These students were purposively selected because it was their first year at university. From the 580 first year group 187 gave consent to participate in this study. This study did not use interviews which are regarded as a standard form of data collection for a phenomenological research design because of the number of participants ($N = 187$). Instead, data was collected by requiring participants to provide written responses to four open ended questions with no limits placed on the length of their responses. These questions were:

1. What made learning easy for you at university during the lockdown period?
2. What made learning challenging for you at university during the lockdown period?
3. Which aspects have made you feel included in university life during the lockdown period?
4. Which aspects have made you feel excluded from university life during the lockdown period?

We thus claim validity of our research findings based not on in-depth accounts of select members of the population, but on longer responses from a much larger proportion of the research population. In addition, we ensured reliability by giving all the participants the same set of questions to answer at the same time. We note that a limitation of this research was that the data was collected at one university with one cohort of student and as such the findings cannot be widely generalized. We addressed

the limitation of using a phenomenological approach by letting the data speak for itself. The data was analyzed using *a priori* and emergent coding methods by using both an inductive and deductive reasoning approach. This approach integrated data-driven codes with theory driven codes allowing for the emergence of themes essential to the description of a phenomena in a phenomenological investigation (Fereday and Muir-Cochrane, 2006). *A priori* coding was used as initial codes of policy, practice and culture were developed ahead of time based on the theoretical framework of the Index for Inclusive Education. Participant responses were initially analyzed and categorized deductively according to statements related to each of these three overarching codes. We firstly individually read the responses students made to each question and categorized these responses according to the index for inclusive education. Thereafter, we compared and discussed our categorizations and made adjustments that were required. Following this, we then categorized student's responses as positive or negative experiences with either policy, practice or culture. In this way the data was analyzed using the *a priori* coding method. This stage was followed by emergent coding where participant statements were further analyzed inductively to generate additional codes from the data. This allowed us to use a thematic data analysis approach, which was guided by the Index for Inclusive dimensions (policy, practice, and culture), to develop overarching categories and subcategories under each indicator. **Table 1** indicates both *a priori* and emergent codes that were derived following this process. By analyzing the data in this way, we were able to answer our main research question which is: How did inclusive policy, practice and culture support first year students' well-being whilst learning online during emergency remote learning?

Reliability was ensured in this study by giving all the research participants the same set of questions to answer at the same time. We ensured trustworthiness by dividing the data analysis between the researchers requiring the researchers to develop a sharp coding tool to ensure that coding was accurate and precise. All ethical consideration such as confidentiality, anonymity and informed consent were adhered to.

RESULTS

The initial *a priori* coding meant that 187 1st year student responses were coded and categorized according to statements related to (a) institutional policy, (b) institutional practice, (c) institutional culture. These responses were then further categorized for expression of statements that were positive or negative in relation to each of the three dimensions. Given that open ended questions were posed and that no limit was placed on length of responses, some student responses contained more than one statement related to each dimension. **Table 2** demonstrates in numeric terms the number of positive and negative student statements related to each dimension.

The numeric representation of initial coding indicates that student responses focused more frequently on their experiences of institutional practice, with 445 statements; followed by experiences of institutional culture with 258 statements and then of institutional policy with 206 statements. The significance of that frequency indication lies in the observation that the actual practices and culture that students were exposed to were more often spoken about by students than the underlying policy that may have informed those practices and that culture.

At the second level of initial analysis where student responses were categorized as either positive or negative experiences in relation to each dimension, an initial surface observation can again be made that it appears slightly more negative than positive statements were made by students in each of the three categories. In relation to policy, 100 positive and 106 negative statements were made. Positive statements related to culture numbered 127 with a slightly higher 131 negative statements. In relation to practice, 200 positive and 245 negative statements were made. Negative statements related to practice were therefore most frequently recorded. The significance of these findings indicate that students had more negative than positive experiences with online learning in relation to their overall wellness.

Emergent coding of each category of statements above was then done to identify themes related to each of the three dimensions of policy, practice and culture and are presented

TABLE 1 | Coding.

STAGE ONE: A <i>priori</i> coding	Policy		Practice		Culture	
	Positive experiences	Negative experiences	Positive experiences	Negative experiences	Positive experiences	Negative experiences
STAGE TWO: Emergent coding	Emotional support Material support Communication	Material challenges Data and network Devices Lack of support	Lecturer support Pedagogical support Flexibility Communication Resources Self-directed strategies	Course content Engagement Workload Resources Environment Pacing	Support Communication	Environment Academic results Exclusion Lack of support Lack of engagement Isolation
Overall themes			Wellness support University communication Data, devices and resources Navigating working from home Wellness challenges			

TABLE 2 | Number of student statements per dimension.

Index for inclusion dimension:	Policy		Practice		Culture	
	Positive experiences	Negative experiences	Positive experiences	Negative experiences	Positive experiences	Negative experiences
Number of responses coded:	100	106	200	245	127	131
Total number of responses:	206		445		258	

here. These themes are (1) Wellness support, (2) University communication, (3) Data, devices and resources, (4) Navigating working from home, and (5) Wellness challenges.

Wellness Support

Student statements revealed that students related experiences with regards to policy support provided by the University during the COVID-19 online learning as well as to supportive institutional practice and culture.

Positive Experiences of Policy Support

The support arrangements made by the university were underpinned by policy or procedural process decisions made during the emergency move to online learning. One such policy decision for example, was that the Centre for Counselling and Development Unit (CCDU) would offer online and telephonic counseling support for students, which could be accessed at any time of the day.

"If as a student you feel down or depressed or has an issue that you want to talk about there is CCDU to help you."

Positive Experiences of Practice Support

Institutional practice in this study was taken to include pedagogical and system processes, procedures, approaches and strategies as well as teaching and learning interactions with lecturers/tutors and peers.

Lecturer Support

In terms of practice, many student responses were positive about personal interactions with lecturers which they felt supported their learning. These interactions included feeling encouraged and understood by their lecturers. Students appreciated the additional help lecturers gave them as well as the willingness of lecturers to adjust expectations and deadlines which students felt acknowledged the unusual and challenging circumstances.

"The assistance from our lectures who were active in answering our mails when we are in need of help and not hesitating to understand our respective circumstances that we live under."

"Direct personal emails from my lecturers."

"The support I received from some of my lecturers and tutors. They were interested in my understanding and progress. They helped me when and where I needed help."

Course Structure

Pedagogical decisions taken by course lecturers were regarded positively by some students. Students appeared to find the decision to upload narrated PowerPoints and/or videos of

lectures helpful. It was interesting to note comments suggesting that for some students, the narrated PowerPoints/lecturer videos provided an opportunity for them to replay or revise sections they were unclear on at their own pace which would not have been possible during face-to-face lectures.

"Teachers providing slides for us to study made it easier for me to learn during this time."

"... they [lecturers] prepared us lecture recordings that made me feel closure, even though there was a physical distance between us."

"What made learning easy for me was the ability to repeat content that I did not understand in a recorded video lesson and take notes as much as possible. Additionally, the organization of resources in subjects makes it to go back and revise accordingly."

Course Instructions

Additional positive practice comments related to pedagogical decisions noted clear instructions, manageable workloads, online activities and feedback on work from lecturers as supportive and flexible. Guidelines, tips and strategies for working online were experienced as helpful by some students as was the use of WhatsApp groups particularly when the learning management system of the university was difficult to access.

"Getting feedbacks on our work has made me feel included."

"The assistance from the tutors and clear instructions from our lecturers made learning easy during the lockdown period."

"What has made learning easier for me is the sites "helping you learn online" that have been provided to us really help a lot as they give guidance to what strategies can we use to help us with learning during this time."

"... we were not put under pressure to submit and the dates were extended upon request. So the stress was a bit less because we had more time to work through assignments and submit quality assignments under a bad environment."

"My Tutors used WhatsApp media to try to make it easier for us to communicate, assist us and make our readings accessible for some of us who couldn't access Sakai¹ all the time, so this kept me motivated that I can still make it on my situation."

Course Engagement

Pedagogical decisions that facilitated engagement were positively commented on by students. These forms of engagement ranged from participation in tutorial groups online, group discussions and/or group work assignments, reminders from lecturers about

¹SAKAI was the online learning management system that the university used in 2020.

work due, chat forums and email communication about content queries between lecturers/tutors and students.

“The tutor groups that we had and online lectures.”

“Working in groups to complete a certain task.”

“The lecturers who put in a lot of effort in their online representation of the work made it also easy to learn the work and that they even had chat forums where they interacted with us.”

“The material provided, having tutorial activities and group discussions.”

“The lectures were attending to whatever was troubling me on Sakai or other assignments and tasks, they would respond very fast to my emails, they had no problem with helping me, on top of that I was constantly reminded of the work I should be doing and was allowed enough time to finish my work.”

Peer Interaction

Comments from students highlighted the importance of these forms of interaction not only in terms of academic practice but also in terms of social and emotional connection. Students noted that participating in academic activities as well as interacting with peers and lecturers provided a source of motivation and support in addition to academic assistance.

“Having a circle of friends who motivate me, whom I talk to whenever I am feeling overwhelmed or helpless or even depressed.”

“Emails from lectures remind us to submit and send encouraging emails from lectures, group chat with other students, and forums to communicate which lectures and students.”

“The group initiatives suggested by the ICT literacy course lecture, gave me a platform to express my concerns, ideas and therefore getting a chance to assist and be assisted by other students.”

University Communication

Communication decisions made by the University were underpinned by policy or procedural process decisions made by the university. Student statements revealed that they had positive experiences with regards to communication received by the university during COVID-19 online learning. Students had not expressed any negative experiences concerning communication from the university.

Positive Experiences With Communication

Student responses noted that communication from the university played a part in their positive experience of policy. This was noted in statements related to general university communication and updates:

“The constant updates the university gives over email”

“The university sent weekly emails to help with coping with our academics, stress, and adapting to the new way of living that we had to be forced into.”

Communication From University Support Services

Directed communication from support services such as CCDU, The First Year Experience group (FYE) and the

Writing Center via email and/or virtual meetings which offered tips, strategies and encouragement were also noted positively:

“The support counseling programs such as CCDU giving us tips on how to cope during the current pandemic we facing such as avoiding distractions made me feel included at university.”

“There was also the writing center which had tips on how we can best complete our tasks and assignments.”

“We were given support by various people from the institution to support us, psychologists to even First-year experience programs. The university provided laptops. They also provided data for online learning. The university also consistently kept in touch with us through student emails and social media.”

Communication and Community

In terms of the institutional culture many students commented on positive experiences primarily reported as feeling part of the community and feeling supported and encouraged by the university community through communication and services. This communication allowed some students to feel recognized on a personal level and assisted them to feel included in the culture of the institution and part of a community.

“Last week I got a message from the humanities office to congratulate me for obtaining a distinction in one of my modules, in that way I feel included from the university.”

“The communication from the institution on updates and assistance made me feel included. It was more of an assurance that we still matter as students even though we are far.”

“The group chats on WhatsApp made me feel included as I could communicate with other people in my degree also experiencing issues and who are going through the same process with me. I also felt included from the emails send which updates students on the protocols and what would be happening with classes and courses.”

“The constant emails of motivation and positivity from Wits made me feel like a part of a big loving community.”

Data, Devices, and Resources

Having access to data, devices, and resources were crucial to students' overall wellness and success. Students indicated having both positive and negative experiences under this theme.

Positive Accounts Relating to Policy Decisions

Support from the university in terms of policy decisions to allocate resources including data and devices as well as to make access to learning management systems such as Sakai zero-rated was also noted by students.

“The data sent by the university, laptop loans, zero-rated university sites and slides posted on Sakai made learning easy for me during this pandemic.”

“They have ensured that allowances are payed in full and sites are zero rated in addition to the 30 GB of data we get monthly.”

“What kept me motivated is that I got all the resources I needed to complete the academic year such as data and a laptop device.”

Negative Accounts Relating to Policy Decisions

Negative accounts included the lack of access to data and the university campus.

Access to Data

Student responses indicated that in many cases policy decisions primarily related to issuing data in the form of daytime/night-time data which limited when students could use data, were experienced negatively. There were also indications that despite the policy decision to make essential sites zero-rated these sites were not always working as they should:

"It is the fact that the data they gave us is not working. Sometimes I need to do some research and I struggle to do that because of the data issue."

"Accessing the library through the zero-rated sites was a hassle as most did not open and some redirected most of the time and I found it difficult to access information I needed for my assignment."

Campus Shut Down

The policy decision to close campus and move to online learning was a necessary decision in terms of the pandemic conditions but was experienced negatively by many students who rely on the resources available on campus. Adapting to the online systems was challenging for many students, particularly those who had previously had little experience of working with computers.

"Adapting to the new online environment was one of the huge steps I had taken this year, as far as the university is concerned. Firstly, I'm a student from an unprivileged school that didn't use much of the technology as a source of delivering content therefore I had to adjust to the university's way of communication and cooperation, which is using the online platforms."

"Not being able to be provided with a conducive study place, I feel the university may have allowed certain learners back earlier but still try and maintain the COVID 19 rules and regulations."

"Not being able to attend classes and being able to stay at Residence."

Navigating Working From Home

COVID 19 conditions meant students had to very quickly adjust their ways of working in diverse home environments. Students indicated positive and negative experiences with regards to working at home.

Positive Accounts of Working Online From Home

Many student comments reflected on their own agency as students during online learning. These comments pointed to self-directed strategies that students were adopting to cope with the online demands. Types of strategies included creating schedules, timetabling activities, staying ahead of readings and developing an adjusted work ethic. Working independently online from home was experienced by some students as a positive practice as these students experienced the opportunity to work at their own pace, and at the time of day that best suited them as an advantage and supportive to their learning.

"Creating a detailed schedule in online learning and adjusting to new habits such as studying midnight has kept me motivated to succeed at university during the lockdown period."

"It is that I am working online and I do not have to wake up in the morning rushing to the class and I get to study at my own pace."

"The ability to learn at a time that is most convenient for me."

"What made learning easy for me at university during this lockdown was because since we are attending classes online, this is such an advantage to me and this is because I learn best during the night compared to during the day so online learning allowed me to learn at my own time."

Negative Accounts of Working Online From Home

However, in contrast to the above some negative experiences related to the added difficulty of navigating online learning from home and balancing personal demands was highlighted by students.

Balancing Home and University Life

Students commented on the distractions of their home environments as well as the expectations of family to take on family responsibilities such as caring for younger siblings during lock down.

"I was not able to spend the same amount of time on schoolwork as I did before lockdown. And with both my parents working 24/7 I had a lot of other commitments to attend to."

"Another thing that made learning challenging is having to work, manage and adjust my learning to suit the environment I am situated in (township, one room home)."

"We was required to go back to our homes for online learning, this became very challenging and demotivating. My home environment is not at all conducive for learning. I had to deal with all distractions from my siblings and I also had to balance my schoolwork with those of home such as doing house chores, these came very demotivating. My community is also a very rural area and I most of the time struggle to connect to the internet and I then remain behind sometimes with schoolwork."

Time Management

The need to work far more independently and manage their own learning schedule and pace proved challenging for some students. Their comments clearly indicated that poor performance in tasks which resulted in low marks due to factors such as difficulty managing time was demotivating. Marks being posted online (by student number rather than name) meant students were aware of how others were performing in the course leading to negative comparisons regarding own performance. Lack of motivation and procrastination were mentioned by a number of students as challenges which impacted negatively on their learning.

"Lack of a schedule, I struggle with time management so not having a proper schedule has made studying difficult."

"The system of online learning and how difficult it is to cope has made me feel unmotivated."

"Comparing myself to other students. Trying to imitate their way of doing things. Not managing my time very well, procrastination."

“Procrastinating, and I think I speak for most students here. Procrastinating has made learning challenging.”

“Unable to use my time wisely. Spending a lot of time on Social media.”

“The lack of structure due to online classes has been challenging. Working from home brings with it a lot of distractions that cannot always be avoided, making concentrating difficult.”

Inequitable Access to Home Recourse

One student commented that it felt like decisions were made that benefited certain students and not others. This comment highlighted the fact that different access to resources and conducive study environments resulted in different experiences of students of online learning.

“Most of the decisions that were taken came from a place of privilege, showing that the poor will never have an important place in society until they make money.”

Wellness Challenges

Transition Challenges

The fact that students were required to make a rapid transition to learning online, and navigate what were for many unfamiliar learning platforms, was technologically challenging for some students. Not only were students adapting to expectations and demands being made on them as first year university students, but they were also simultaneously adapting to working primarily with technology that was unfamiliar to many.

“To adapt to a new type of learning was not easy because I was not used to computers, so I was supposed to learn how to use a Computer while online classes have started of which I will be left behind.”

“Zoom Meetings, because I had a lack of knowledge on how to use or access them.”

“Regarding that I’m a first year student, online learning was a great challenge for me. At first, I wanted to just quit with school.”

“The thing that made learning challenging was the fact that we were supposed to do online test and do everything online, that to me was a bit overwhelming and hard to deal with.”

Effect of Online Learning

The negative experiences of managing online learning appears to have resulted in a cycle of demotivation that leads to anxiety and feelings of being overwhelmed for some students. The two student quotes below demonstrate many of the challenges previously discussed and the personal and social effect for these students.

“When we went on lockdown and moved to online learning, I was still trying to find a way to settle in the university environment, and then I had to do some adjustments again and adapt to online learning which I had to do at home. It was not easy. I could not cope. I did not know how to really fully focus. I therefore could not do most of my work and I failed most of my tasks. That made me feel like quitting. I thought that I will never get to do better. I was scared that I will fail this academic year and my prayer was that this

academic year be canceled so that I could be saved from all the stress I went through.”

“it was my first time attending a lesson online, so I was having some challenges in terms of time management for my studies and also to be able to prepare for tests in time, so this made me to feel nervous about the online learning and this has led me to feel unmotivated, . . . this made me to be also stressed and worried about everything I was going through and this is because I am afraid of failing one or more of my modules.”

Systemic Challenges

Students needing to move home, additionally highlighted many systemic challenges such as lack of electricity and load shedding (switching off electricity supply to certain areas for particular times during the day in rotation to reduce load on the electricity grid) which negatively affected many students.

“At first it was the environment I am living in there is a shortage of electricity which lead to network problems so this acted as a setback on my academic work.”

“What made learning challenging for me at the university during the lockdown period was that I very little access to the internet because data was provided for a short period of time, poor electricity supply, load shading and laptop technical problems, these factors made learning challenging for me because I was unable to fully engage in the remote learning which led to failure of submission of the other outstanding assignments and tasks.”

“Where I live, we are affected by electricity problems so sometimes we spend weeks without electricity. That makes me to fall behind with my work. It piles up and the most challenging part is keeping up with deadlines.”

Academic Challenges

Despite some of the positive practice experiences of students, it is important to note that many students experienced academic challenges in relation to institutional practice. A key challenge noted in student responses was the difficulty experienced understanding course concepts when working online and independently. The difficulty in understanding course content and concepts appeared to be exacerbated by high volumes of content placed online and the limited opportunity to ask immediate questions and receive clarification as would have been possible in face-to-face contact sessions. Difficulties with the pace and amount of work online, lack of detailed feedback on how to improve as well as some students feeling that they were not able to access assistance or were not responded to timeously were experienced as challenges by these students. Feelings of being overwhelmed and wanting to drop out were expressed in relation to these challenges.

“Also having to understand a lot of content online was stressful, it made want to drop out.”

“I feel like learning become so challenging because I no longer have that opportunity to consult my lectures and tutors face to face which that made it easier for me to understand quickly but since I cannot anymore it takes me a while to understand that particular thing.”

“Some lecturers were moving at a slightly higher pace regardless with our concerns. The receiving of marks with vague critiques or none left me excluded. I feel like I don’t know where to improve.”

“Sometimes when I was studying content it was not that easy to understand those content and the disadvantage was that even though we had our lectures that we emailed when we need help, but I feels like sometimes one needs a contact or face to face explanation in order to understand clearly rather than a written text.”

“I am constantly lost and confused and having to ask for help all the time is demotivating.”

“Also when I get too many notes to read, I feel demotivated because at times I cannot understand anything.”

Lack of Contact

Whilst unavoidable given pandemic conditions, the lack of face-to-face contact and interaction with lecturers and peers was experienced as an academic practice challenge by many students. Students commented that this lack of contact was demotivating and made engagement and understanding explanations more difficult.

“I think I needed more face to face help because it seems way better.”

“The lack of face to face interaction and deeply engaging in the course as we usually do on our tutorials.”

“Learning during the lockdown is challenging because you are not able to ask your lectures to explain something face-to-face.”

“I feel excluded when I can’t ask lectures questions when I am lost and also sometimes the explanation they give via email is a bit hard to understand then what I would of understand when they would give me face to face explanations.”

Emotional Challenges

Emotional challenges such as feelings of isolation and depression related to being unable to attend classes on campus in addition to the systemic challenges of the home environment were also noted. Many were sad that they had lost the opportunity to fully experience their first year of university life on campus. This coupled with fears for their own and their family’s safety and the emotional strain of dealing with grieving for lost family members and friends took their toll on students and their capacity to engage with learning.

“I was so depressed because I was so lonely I had few people to speak to.”

“I have felt unmotivated during lock down by not having social contact with any of my friends or lecturers. This led to social isolation.”

“A big part of university life is being on campus and since we are confined to our homes, I feel quite robbed of the first-year experience I was not getting the first year experience that everyone talks about.”

1 *“One of the biggest challenges is death, grieving and schoolwork at the same time 🤔😭💔💔. Last month we buried one member and 2 relatives of my family. First it was my grandmother then her two nephews. As I’m speaking right now Friday we lost my uncle unexpectedly and they putting him to his last place on Saturday. My grandmother’s body hasn’t even decomposed but her son just*

followed her. This grieving thing is too much for me and school on the side. This week I was suppose to focus on my online TE [teaching practice] peacefully and finish it thoroughly. I have tutorial tasks to do this grieving has made my studies challenging and very difficult I think I’m gonna lose my breath. I hope by miracle pass this module of which I doubt.”

“All the uncertainty around this year has left me feeling unmotivated. Not knowing when things will return to “normal” has been difficult. A sudden death in the family has also left me extremely unmotivated and reluctant to work.”

“Living with my thoughts alone for 6 months can definitely keep a person unmotivated. The thought of sickness, death even. The future is not certain, it usually never is, but now more than ever. And the constant thought of that is really a hindrance if you’re trying to focus on something as simple as test scores.”

DISCUSSION

The Index for Inclusion which identifies the three dimensions of policy, practice and culture (Booth and Ainscow, 2011) articulates particular indicators to guide reflection on how inclusive a school’s (or institution’s) policy, practice and culture are and to guide plans for future development. In this study these indicators are used in each dimension to discuss the findings and consider the implications for student well-being.

Across all three dimensions of policy, practice and culture it was found that students reported both positive and negative experiences that contributed to their feeling more or less included as first year university students and that either supported or compromised their learning during online learning.

In terms of institutional policy, it was found that policy decisions that related to ensuring support services were available, regular communication and supplying data and devices were appreciated by students as allowing them to feel included and able to participate in learning. These speaks to the Index for Inclusion imperative to produce inclusive policies that develop the school for all and that organize support for diversity. One of the indicators for developing the school for all (Booth and Ainscow, 2011, p. 176) notes that “the school makes its buildings physically accessible to all people.” Given that the university was unable to continue face to face contact on campus during the lockdown this priority to ensure accessibility was seen in the provision of data and devices to enable students to access the online materials. This provisioning, however, did not appear to reach all students who required it as noted by comments that suggested students did not have laptops to work with and could have been experienced as exclusionary by those students for whom the data provisioning was insufficient to support their needs.

In terms of practice, as part of the inclusive practices dimension, Booth and Ainscow (2011) suggest teaching is planned with the learning of all students in mind (p. 177). Findings related to practice in this study suggest that pedagogical approaches taken by lecturers to provide lectures online and guide students through online activities and tasks were experienced by some as supportive and by others as less so. It appeared that for those students who were familiar with

computer technology and confident to email lecturers to ask questions, the online learning challenges were minimized. In contrast for those who needed to first learn the technology and then use it for course work requirements, and for those who felt they were not able to access assistance when needed, challenges of online learning were exacerbated. Alqurashi (2016) noted that the challenge of having a lack of computer self-efficacy impacted on student satisfaction with online learning and we would argue that it also impacts on their learning success and overall wellness. Understanding course concepts and content online was challenging for many with students repeatedly commenting on the lack of opportunity to ask for immediate clarification as they would in face-to-face sessions. This is supported by the argument that psycho-pedagogical challenges can be better dealt with during contact sessions (Slonimsky and Shalem, 2006; Ramrathan, 2013; Camelia and Nastase, 2018; Dison et al., 2019). It should be noted however, that there were some students who indicated that the ability to go back and rewatch lecture videos or revisit narrated PowerPoints actually supported their understanding of concepts. Feedback on work from lecturers supported learning when that feedback was detailed and directed but frustrated students when feedback was perceived as vague and non-directive.

Booth and Ainscow (2011) also indicate that students should be actively involved in their own learning as part of practice. In this study it was found that students who were able to draw on self-directed strategies and develop their own time management and coping skills were able to cope with the demands of working independently. Those students who were less able to draw on their own inner resources or self-regulate their pacing and completion of work appeared to be more vulnerable to feeling overwhelmed by the requirements of online learning. This was exacerbated by the fact that students were learning online in very different home circumstances with varying levels of home and resource support and were experiencing a variety of systemic challenges at the same time. Many students pointed to the difficulties of coping with poor network, lack of electricity and loadshedding which are challenges that have been noted in various research studies in South African (see Rushiella et al., 2021). Students also pointed to difficulties balancing university work and home demands and to finding conducive workspaces free from distractions at home. Flexibility on the part of lecturers in allowing necessary extension for work was seen to demonstrate that lecturers understood these individual circumstances and was appreciated as being supportive. Negative individual circumstances were found to have negative implications for environmental wellness (Mishra et al., 2020), financial wellness (Camelia and Nastase, 2018), and emotional wellness (Swarbrick and Yudof, 2015).

The need for students to work collaboratively is highlighted by Booth and Ainscow (2011, p. 177) as an inclusive practice. This was made difficult in the online learning mode but many students were able to point to opportunities created by their lecturers for collaborative group work and interactive group discussions. Students appeared to find the use of chat forums and WhatsApp groups helpful and supportive. It was found that this allowed students to remain feeling connected. Email communication

from lecturers to students as well as online discussions allowed students to feel connected to their lecturers. The emotional effects of isolation on the other hand were reported as profound with depression, anxiety and feelings of being lost being reported. This speaks to the negative impact on spiritual wellness (Swarbrick and Yudof, 2015) as well as emotional and social wellness (Ferri et al., 2020).

In terms of inclusive culture Booth and Ainscow (2011, p. 176) suggest that it is essential to build community. The constant communication and updates from the university allowed students to continue to feel part of the university community. It was found that students appreciated the personal touch that these email communications conveyed. What undermined the feeling of community however, was that some students felt university decisions, such as to close down the residence, were made in the interests of some but not all students. Not allowing students in need back to residence was seen as ignoring the plight of less privileged students. In one case a student noted that not being in residence meant there was no longer access to meals, this is a stark reminder of the impact on physical wellness for these students (Swarbrick and Yudof, 2015, p. 4). Almost all students however, appeared to miss the access to university facilities both as resources and sites of social interaction. The students reported feelings of having lost out on the first-year university experience by not being able to be on campus.

We argue that these findings suggest that while the university made strong efforts to support learning during online learning through policy, practice and culture, this was not experienced by all students in the same way. As such these findings are in line with Dias and Sá (2014, p. 300) view that transition to university is a period “uncertainty and volatility” that remained unchanged and, in some instances, has become more complex during the move to online learning. What our study has highlighted is that online learning has had a negative effect on student overall spiritual, physical, emotional and social wellness. On a positive note, online learning has provided some students with more time to access information at the own pace in order to revise work. Most evident to us, as highlighted by the findings in this study, is that individual circumstances, agency and environment all contributed to supporting or undermining students’ ability to participate fully in online learning and affected student wellbeing either positively or negatively depending on these circumstances and experiences.

CONCLUSION

Swarbrick and Yudof’s (2015) eight broad dimensions of holistic wellness provide a framework for understanding the profound effect of learning online under pandemic conditions experienced by the first-year university participants in this study. Physical wellness was compromised for many by nature of the fact that they were unable to access residences and the associated physical space and nutritional resources. Emotional wellness was challenged for students in terms of dealing with feelings of isolation, loneliness, anxiety, depression, uncertainty and grief despite committed efforts on the part of the university to

reach out and provide ongoing support services to students. Spiritual wellness was challenged in the face of uncertainty about the future whilst social wellness was compromised by lack of social interaction. Even though students recognized the attempt by the university to make them feel part of the community and even though many reported feeling supported by online social groups, it must be acknowledged that this was less than would normally have been possible under usual circumstances. Intellectual wellness was equally challenged for many, with difficulties understanding and keeping up with online work being noted. This experience was however not equal across the student participants as some did experience that they felt better able to learn in an online environment. Environmental wellness and financial wellness demonstrate the unevenness of experience with home circumstances being largely the determinant of whether or not wellness was challenged for individual students. We argue that this clearly demonstrates that considerations of learning be it online or in person and implications for wellness cannot be divorced from considerations of systemic and individual contexts and that this needs to be the starting point for thinking about inclusive policy, practice and culture in order to support the full participation of all. Our recommendation is that higher education institutions prioritize the psycho-social, emotional and financial well-being of students during the period of online learning by providing students with access to wellness support mentors and information on who to

contact should they need guidance and support and not just the pedagogic needs of the qualification. We also recommend that further research be conducted on students overall well-being in relation to working online.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of the Witwatersrand. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

Both authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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Enabling Self-Directed Academic and Personal Wellbeing Through Cognitive Education

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Background: The international crisis of declining learner wellbeing exacerbated by the COVID-19 pandemic with its devastating effects on physical health and wellbeing, impels the prioritization of initiatives for specifically enabling academic and personal wellbeing among school learners to ensure autonomous functioning and flourishing in academic and daily life. Research emphasizes the role of self-directed action in fostering wellbeing. However, there is limited research evidence of how self-directed action among school learners could be advanced.

Aim: We explore the effectiveness of an intervention initiative that exposes teachers to foregrounding Cognitive Education – the explicit and purposeful teaching of thinking skills and dispositions to learners that would advance self-regulated action - to establish the latent potential of the intervention for assisting learners to develop self-regulating abilities that progressively inspires increased self-directed action.

Method: We illuminate the qualitative outcomes of an exploratory pilot study with a heterogeneous group of willing in-service teachers from two public primary schools ($n = 12$), one private primary school ($n = 3$), and one pre-school ($n = 2$) in South Africa who received exposure to an 80-h intervention that comprised seven study units. The article delineates the experiences of the teachers concerning their participation in the intervention as reflected in their written reflections, as well as their perceptions about the value of the intervention probed with semi-structured one-on-one interviews after completion of the intervention.

Results: The findings revealed that exposure to the intervention holds benefits for equipping teachers with teaching strategies to create classroom conditions that nurture the development of thinking skills and dispositions that are important for self-regulating, and ultimately self-directing academic and personal wellbeing.

Conclusion: Cognitive Education is a form of strengths-based education that can play an indispensable role in enabling self-directed academic and personal wellbeing among school learners.

Keywords: self-directed learning, academic wellbeing, personal wellbeing, positive psychology, Cognitive Education

INTRODUCTION

Enabling self-directed academic and personal wellbeing among learners at school needs to be established as an education priority (Katja et al., 2002; Konu et al., 2002) nationally and internationally to set up a positive foundation for autonomous functioning and flourishing in adulthood (Suldo et al., 2006; Seligman, 2011; Eryilmaz, 2012; Fomina et al., 2020). Due to a continuous decline in child health and wellbeing globally (Neves and Hillman, 2018; Riva et al., 2020; Paulson et al., 2021), a focused interest in wellbeing has surfaced on the policy agendas of many nations (Shirley, 2020). This is plausible considering that international research across eight countries indicates that a third of the school leavers entering university screen positive for emotional wellbeing problems such as depression and anxiety (Auerbach et al., 2018). With specific reference to South Africa, the country where the research was conducted, the decline in the mental health and wellbeing of school leavers has become serious (Eloff and Graham, 2020), with 11.2% of school leavers entering university experiencing emotional and mental wellbeing problems (Bantjes et al., 2016). Particularly, since the emergence of the coronavirus pandemic across the world an increased focus on academic and personal wellbeing has emerged due to the unfavorable and devastating effects of the coronavirus pandemic on among others, mental and physical health and wellbeing (Abbas et al., 2019, 2021a,b; Aqeel et al., 2021; Khazaie et al., 2021; Lebni et al., 2021; Liu et al., 2021; Maqsood et al., 2021; Su et al., 2021; Wang et al., 2021). The devastating effects compound existing academic and personal wellbeing difficulties (Abbas et al., 2019; Aqeel et al., 2021; Maqsood et al., 2021). Some of the devastating effects that are of relevance for the article are activated by many unforeseen changes to learners' daily life routines, such as the closure of educational institutions and the switch to virtual education and online learning (Abbas et al., 2019), as well as social distancing (Aqeel et al., 2021; Su et al., 2021; Wang et al., 2021).

The ability to self-direct thinking, feelings, mood, and functioning in dealing with unforeseen changes and situations that could affect one's wellbeing is accentuated in the literature (Brockett, 2006; Ouweneel et al., 2011; Villavicencio and Bernardo, 2013). Nevertheless, there still seems to be little emphasis on how to support school learners in developing strengths concerning the thinking skills and dispositions they require to become self-directed (Booyse, 2016; Harrington, 2018). Besides, Kazachikhina (2019) confirms that little attention is paid to explicitly encouraging self-directed learning. Learners for example lack metacognitive skills to self-regulate learning and find it difficult to reflect on and direct their learning to ensure progress (Fashant et al., 2020). This problem is compounded by teachers who still appear to be using teaching approaches that no longer serve the self-directed roles learners will have to play in the 21st century (Jansen, 2012; Pretorius, 2014; Eyre, 2016; Lotz, 2016). Patrinos (2020) adds that learners need to possess skills and dispositions to direct and manage their learning progress, establish worthwhile relationships, enjoy a successful and high-quality life, and contribute to a meaningful and reliable society.

It is important for teachers, as role models to learners, to be knowledgeable about teaching approaches that are effective to transform learners from dependent to self-directed (Taylor, 2011; Booyse, 2016; Herlo, 2017; Kazachikhina, 2019), as the authors believe it is unlikely that learners will automatically become self-directed. Teachers are obliged to embrace the urgency to reform their teaching approaches to purposefully foreground intellectual and emotional learning (the development of thinking skills and dispositions) that would support the enabling of self-directed academic and personal wellbeing (Klaus, 2015; Bailey, 2016; Obied and Gad, 2017; Uribe-Enciso et al., 2017; Coberley-Holt and Elufiede, 2019). To this end, the authors postulate that a classroom environment that foregrounds Cognitive Education could dispose learners to conditions that aim to purposefully/intentionally capacitate learners to acquire the thinking skills and dispositions to become self-directed, autonomous thinkers, and lifelong learners (Anderson, 2010; Moonsamy, 2014). In so doing, the authors contend that the capacity for guaranteeing that the learners can flourish and lead productive and satisfying lives will be built.

Problem Statement

Although the connectedness between self-directed learning, academic, and personal wellbeing as well as Cognitive Education could be regarded as logical, Sebotsa et al. (2019) contend that the development of self-directed learning, in particular, seems to be absent in many South African schools. Additionally, Nasri (2017) asserts that although a plethora of research documents the role of learners in the context of self-directed learning, there appears to be a lack of research that probes the teacher's role in the context of developing self-directed learning. This, according to Sebotsa et al. (2019) could be linked to among others, teachers' themselves not being self-directed, and therefore not enhancing self-directed learning in their classrooms. Geared toward a possible solution for the mentioned problems, this article aims to answer the following research question: How might an intervention in Cognitive Education support in-service teachers in enabling self-regulated academic and personal wellbeing among school learners?

To debate the stance for a cognitive approach to education, the authors organized the article as follows. Firstly, a literature review addresses the following objectives, namely to (i) deconstruct the components of academic and personal wellbeing, (ii) deconstruct the component of self-regulated and self-directed learning; (iii) establish the association between self-directed learning and academic and personal wellbeing, and (iv) delineate the contribution of Cognitive Education toward enabling self-directed academic and personal wellbeing. The literature review is followed by an exposition of the research materials and methods to explore the contribution of a Cognitive Education intervention toward enabling self-regulated academic and personal wellbeing. Thereafter, a presentation of the research results and a comprehensive discussion of the research findings follow. A conclusion that outlines the contributions of the research rounds off the article.

LITERATURE REVIEW

The literature review presents a succinct overview of the main concepts that stood central to the research reported in the article.

Deconstructing the Components of Academic and Personal Wellbeing

Academic wellbeing among learners could be viewed from a positive and negative angle. Firstly, in a positive sense academic wellbeing is linked to school engagement which refers to displaying energy at schoolwork, experiencing school work as meaningful, being immersed, engaged, and involved in school work, and having an achievement-goal orientation (Huppert and So, 2009; Lewis et al., 2011; Ouweneel et al., 2011; Tuominen-Soini et al., 2012; Salmela-Aro and Upadyaya, 2014; Wang and Degol, 2014; Wang and Fredricks, 2014; Wang et al., 2015; Rimpelä et al., 2020; Tuominen et al., 2020). Secondly, in a negative sense, academic discontent is related to school burnout, which testifies to weariness toward school work, being pessimistic about the meaning of school, and a feeling of inadequacy concerning progress and performance (Salmela-Aro and Upadyaya, 2014; Rimpelä et al., 2020).

Greater concerns about learners' academic wellbeing have been voiced since the COVID-19 pandemic, as virtual education replaced contact education. Despite holding promises for academic wellbeing, Abbas et al. (2019) contend that virtual education also poses negative threats to academic wellbeing. In a negative sense, the unfamiliarity with virtual education, and a lack of proper access to systems that offer e-learning might contribute to anxiety, frustration, stress, and feelings of incapacity that could lead to academic discontent, feelings of dissatisfaction, and academic ineffectiveness. Also, learners might require time to build self-confidence in feeling comfortable with the shift to virtual learning, which might affect emotional wellbeing. The disruption in normal school routine with less face-to-face interaction and more engagement with networking websites and social media (Abbas et al., 2019) could distract focus from academic work (Maqsood et al., 2021), leading to a decline in academic performance (Abbas et al., 2019; Aqeel et al., 2021). Conversely, if learners know how to engage adequately with virtual learning, networking websites, and social media (Lebni et al., 2021) their academic wellbeing could undoubtedly be enhanced as they become more immersed in learning experiences through the possibility of interactional communication, collaboration with others, the sharing of information, and receiving support from others during learning (Abbas et al., 2019, 2021b).

Personal wellbeing constitutes psychological, emotional, and social aspects (Gräbel, 2017), and which, according to Lebni et al. (2021), collectively holds significance for mental wellbeing. Lebni et al. (2021) view mental wellbeing as foundational to upholding productivity and accomplishment in society. They, therefore, accentuate the importance of individuals who can reflect on their thinking, feelings, moods, and functioning in daily life, can cope with the demands of life, and contribute to

their communities. Lebni et al. (2021) in particular emphasize the importance of mental wellbeing to ensure physical health, manage stress, establish relationships with others, and make healthy lifestyle choices. This close association between physical health and wellbeing, emotional wellbeing, and social wellbeing is also embraced by Pouresmaeil et al. (2019).

Psychological or eudaimonic components of wellbeing (Ryan and Deci, 2001) comprise among others, experiencing purpose in life, life satisfaction, personal growth, personal success, environmental mastery, self-acceptance, autonomy, and self-determination (Ryff and Keyes, 1995; Ryan and Deci, 2001; Ryff and Singer, 2006; Ruppel et al., 2015).

Emotional or hedonic aspects of wellbeing involve satisfaction with one's own life, as well as striving toward positive emotions (resilience, self-motivation, self-esteem, self-efficacy, passion, curiosity, pleasure, enjoyment, and enthusiasm) (Ryan and Deci, 2001; Schimmack and Diener, 2003; Wang et al., 2007; Seligman, 2011; Fomina et al., 2020). Dealing with negative or dysfunctional emotions (stress, depression, anxiety, aggression, and procrastination) (Park et al., 2012; Hardy et al., 2013; Firoozabadi et al., 2018; Zhao et al., 2019) is cardinal in ensuring emotional wellbeing. Reflecting on the foregoing description of academic wellbeing, it seems fair to conclude that experiencing positive emotions and academic wellbeing have strong links with each other.

Social wellbeing relates to holding positive attitudes toward others (Keyes, 1998; Ryff and Singer, 2006) and displaying a strong social connectedness (Olsson et al., 2013) in one's environment. A lack of social wellbeing could manifest as avoidance behavior, social isolation, sadness, and self-doubt (Saeri et al., 2017). More than ever before, a concern for the social wellbeing of learners needs to be accentuated, because of social isolation and distancing that have been activated by the COVID-19 pandemic (Aqeel et al., 2021; Su et al., 2021; Wang et al., 2021). Social isolation and distancing could especially compound feelings of loneliness. In particular, the effects of social isolation on the academic and personal wellbeing of a learner growing up in an abusive family could discourage emotional wellbeing due to increased feelings of frustration, stress, and anxiety (Aqeel et al., 2021), which, on the account of the authors, should not be underscored.

The research of Fattahi et al. (2020) in particular prioritizes the need for psychosocial wellbeing above education needs. Khazaie et al. (2021) and Lebni et al. (2021) in particular alert to the fact that the maladaptive and addictive use of the internet plays a prominent role in the virtual learning environment initiated by the COVID-19 pandemic could in particular contribute to the manifestation of psychosocial wellbeing problems. Additionally, a sedentary lifestyle could become the standard way of living, affecting physical health and wellbeing (Abbas et al., 2019). Abbas et al. (2021b) contend that the internet makes it possible to virtually make social contact with friends and family and aids in obtaining useful health-related information to alleviate the stress associated with the increased fear of COVID-19 being life-threatening. However, many internet sites propel negativity that can cause emotional stress, anxiety, and tension (Abbas et al., 2019;

Su et al., 2021), therefore impeding emotional wellbeing. Also, the lack of face-to-face contact could complicate the development of social skills and dispositions to establish relationships in the real world (Abbas et al., 2019; Khazaie et al., 2021).

Considering the foregoing descriptions, one could, in essence, conclude that both academic and personal wellbeing evolves around the core elements of wellbeing identified by Seligman (2011, p. 16), namely, positive emotions, positive engagement, positive relationships, finding meaning in and making meaning of life situations, and accomplishment (achieving something successfully).

Deconstructing the Components of Self-Regulated and Self-Directed Learning

Pouresmaeil et al. (2019) convey the 21st-century health goals of the World Health Organization for the improvement of wellbeing among the young that encompasses the acceptance of greater social obligation, and in particular personal responsibility for living, perseverance to cope with stress, and establishing meaningful relationships. In the authors' opinion, achieving the mentioned goals requires the ability to increasingly self-direct behavior and action toward ensuring wellbeing. Helping young people in particular to enable academic and personal wellbeing, self-directed learning appears to be beneficial, as it capacitates learners to autonomously take control over their intellectual/cognitive, motivational, emotional/affective, and environmental/contextual situatedness across changing circumstances and contexts (Sandhu and Zarabi, 2018) to protect their wellbeing (Schimmack and Diener, 2003; Karademas, 2006; Ryan and Deci, 2011; Moreira et al., 2015). To this end, Knowles (1975), a pioneer in the field of self-directed learning, defines self-directed learning as a process in which learners independently diagnose their intellectual and emotional learning needs, identify and formulate learning goals, gather resources to support learning, select and implement learning strategies, and evaluate learning outcomes. Capacitating learners to become self-directed learners who are able learners to take ownership of responsiveness to learn (Long, 1989; Garrison, 1997), requires the development of core critical thinking skills such as analysis, evaluation, making inferences, explanation, interpretation, reflection, as well as self-regulation processes that lie at the core of being able to self-direct one's actions and behavior (Bailey, 2016; Uribe-Enciso et al., 2017; Coberley-Holt and Elufiede, 2019). Moreover, the development of dispositions, such as perseverance, curiosity, inquisitiveness, empathy, integrity, humility, fairness, open-mindedness, a questioning attitude, and systematic working ways, need to be nurtured, as they are viewed as important characteristics of a self-directed learner (Seligman, 2011; Guglielmino, 2013; Barrett, 2014; Obied and Gad, 2017).

Promoting self-regulation in a classroom is multi-dimensional in nature and focuses on the application of strategies related to each of the following key components that need to be self-managed and regulated during learning: (i) Cognition

(conceptual knowledge, knowledge about learning strategies and their application, critical thinking, and problem-solving skills) (Kellenberg et al., 2017; Schunk and Greene, 2017); (ii) metacognition (observing, reflecting, and thinking about one's understanding and efforts to complete tasks, as well as possible adaptations of the learning process (Kellenberg et al., 2017; Escorcía and Gimenes, 2020); (iii) motivation (regulating the desire to engage in learning and achieve goals and one's beliefs about one's success) (Kellenberg et al., 2017; Palfreyman and Benson, 2019), (iv) emotion/affect (regulating one's feelings and emotions about engaging in learning) (Kellenberg et al., 2017; Schunk and Greene, 2017); and (v) context/environment (managing the optimal use of resources for learning and the surroundings where learning takes place) (Escorcía and Gimenes, 2020). Primarily, the self-regulation process applied to each of the aforementioned components involves metacognitive action to plan, monitor, and evaluate strategies to ensure successful learning (the cognitive component) as well as the managing of motivation levels, emotions, and environmental constraints that might obstruct successful learning.

Fostering the ability to self-regulate cognition, metacognition, motivation, emotion/affect, and the context/environment in the context of classroom learning requires support and supervision from teachers. Teachers need to model desirable strategies to self-regulate behavior to learners and create conditions for learners to practice self-regulation, that eventually would lay the foundation for a more autonomous, self-directed, and unsupervised ability (Herlo, 2017; Kazachikhina, 2019; Oates, 2019) to self-manage cognition, metacognition, motivation, emotion/affect, and the context/environment during learning (Hammond and Collins, 1991; Brookfield, 1993; Caffarella, 1993; Zimmerman, 2000; Du Toit-Brits, 2018; Sandhu and Zarabi, 2018).

In the opinion of Pandolpho (2018), self-directed learners are in charge of their learning, experience a greater sense of belonging, feel more respected as the authors of their own stories, and take ownership of the achievements/victories and failures that occur on their learning journeys. Conley (2014, p. 1020) continues, and reports that the enabling of ownership during learning enhances persistence, motivation and engagement, goal-orientation and self-direction, self-efficacy and self-confidence, as well as metacognition and self-monitoring behavior. Building on the argument of Conley (2014) and Pandolpho (2018), the authors believe that promoting self-directed ownership during learning is undoubtedly foundational to enabling academic and personal wellbeing.

A large amount of overlap seems to exist between self-directed learning and self-regulated learning. For this research report that emphasizes the nurturing of self-directed learning through Cognitive Education, the authors present the following pointers to illuminate the relationship between the two concepts. The roots of self-regulated learning are found in school learning with children and adolescents, while self-directed learning is rooted in adult education and education outside school (Cosnefroy and Carré, 2014). Nevertheless, the authors argue that the pressing need for prioritizing learner wellbeing, securing a more autonomous workforce, and ensuring lifelong learning in the 21st century underscores the urgency to employ

the school curriculum as a driver for the enabling of self-directed learning too.

Flowing from the brief background introduction to self-regulated and self-directed learning, one concludes that self-regulated learning and self-directed learning involve active, independent, and goal-directed learning for which purposeful mental actions, processes, and decisions are required, and comprise an element of student control and ownership (Cosnefroy and Carré, 2014). Some of the important differences between the two concepts as observed by Carré and Cosnefroy (2011) and Cosnefroy and Carré (2014) that are relevant for the article involve the following: in the context of self-directed learning, learning tasks are always defined independently by the learner, thus implying self-regulation ability and self-determination. In contrast, self-regulated learning often involves tasks generated by the teacher, signifying that self-regulation could also be controlled externally by a teacher for example. Self-regulated learning can involve learner self-determination but never fully implies self-directed learning. For this reason, self-regulation should be viewed on a continuum from low-self-regulation (external teacher control is evident) to high self-regulation (learner choices and decisions play a determining role during learning). Self-directed learning and self-regulated learning involve the ability to self-regulate decisions about cognition, metacognition, motivation, emotion/affect, and the context/environment in the context of classroom learning, with self-directed learning focusing exclusively on independent learner initiated decisions and self-regulated learning on a combination of teacher controlled decisions and learner initiated decisions.

Establishing the Association Between Self-Directed Learning and Academic and Personal Wellbeing

Becoming self-directed in reflecting about, observing, and adapting one's cognitive, motivational, emotional/affective, and contextual/environmental efforts and decisions during learning could assist in enabling academic and personal (psychological, emotional, and social) wellbeing (Ouweneel et al., 2011; Villavicencio and Bernardo, 2013).

In the opinion of the authors, directing the self (motivation and emotions) during the learning process would be beneficial toward fostering emotional and psychological wellbeing. Being able to self-direct the cognitive dimension of the learning process implies defining a task, setting goals to achieve, selecting strategies to achieve the goals – which might often involve working with others – as well as managing the actual task performance and making adaptations if necessary. Cognitive engagement contributes to learners becoming immersed, engaged, and involved in achieving learning goals, which could among others, boost performance, meaningful learning, social connectedness, success, self-efficacy, and pleasure; features of academic, psychological, emotional, and social wellbeing. Autonomously managing the context/environment in which learning takes place is likely to ensure the optimal use of resources that could contribute to the elimination of cognitive,

motivational, and emotional obstacles to successful learning, thus contributing to elevating academic and personal wellbeing.

The Contribution of Cognitive Education Toward Enabling Self-Directed Academic and Personal Wellbeing

To apply a cognitive approach to teaching, teachers must have a better understanding of the processes required to adapt their teaching practices to enhance the cognitive potential (thinking skills and dispositions) of learners that would benefit their ability to become effective at supervised self-regulated learning, which is considered a prerequisite for becoming autonomous and self-directed. The theoretical conceptualization of Cognitive Education hinges on three pillars, namely, teaching FOR, OF, and ABOUT thinking (Anderson, 2010). Teaching FOR thinking involves the creation of school-wide and classroom conditions that support the development of thinking skills and dispositions that are also important for enabling self-directed academic and personal wellbeing. Teaching OF thinking accentuates the explicit teaching and modeling of thinking skills and dispositions to learners that would encourage involvement in supervised self-regulated learning to become self-directed learners in the future. Educators who focus on the teaching OF thinking guide learners on how to become effective self-regulated thinkers who will be prepared to take on and abolish challenges that threaten their academic and personal wellbeing throughout their lives (Pajares, 2001; Booysen et al., 2017). A strong focus is placed on “how” subject content is taught. Cognitive Education assumes a constructionist (Mezirow, 1997), transformative (McGonigal, 2005; Herlo, 2017), and experiential approach (Jensen, 2005) to teaching and learning, where teaching and learning are inquiry-based, anchored in real-world problems, and learners build their academic capability, guided by teachers, to become progressively independent, critical, and confident participants who can self-direct the learning process (Wegerif, 2013; Green and Murriss, 2014). Different strategies that promote inquiry-based learning could be utilized, such as questioning (Green and Murriss, 2014), problem-based learning (Dostál, 2015), didactic play (Bodrova and Leong, 2012), the use of stories (Van Aswegen, 2015), De Bono's six thinking hats (De Bono, 1992), cooperative learning (Weidner, 2003), dialogic education (Alexander and Wolfe, 2008), argumentation (Van den Berg, 2010) and Thinking Maps (Hyerle and Alper, 2011; Hyerle, 2014). As part of teaching ABOUT thinking, teachers help learners to become aware of, and apply the metacognitive thinking processes involved in self-regulating behavior, namely planning, monitoring, and evaluating learning, thus emphasizing the role of self-reflection during learning (Anderson, 2010). By applying self-regulation processes, learners become acquainted with regulating and eliminating the motivational -, affective -, and behavioral processes, as well as conditions in their environment that might obstruct academic success and wellbeing (Moonsamy, 2014). In a nutshell, Cognitive Education is characterized by instructional processes that enable learners to assume responsibility for regulating their academic and personal wellbeing during learning with the support of the teachers. Learners gradually learn to

take complete ownership for modulating emotions, thoughts, behaviors, and the environment to maximize effective outcomes without support (Williams et al., 2008), consequently to be regarded as self-directed learners.

For advancing self-directed learning, Cognitive Education emphasizes the development of critical thinking skills such as analysis, evaluation, making inferences, explanation, interpretation, and the metacognitive skill to self-regulate (Bailey, 2016; Coberley-Holt and Elufiede, 2019). Additionally, Cognitive Education supports the development of dispositions such as perseverance, curiosity, inquisitiveness, questioning, and systematic working ways, which are viewed as important characteristics of a self-directed learner (Guglielmino, 2013; Barrett, 2014; Obied and Gad, 2017). Both the critical thinking skills, as well as the dispositions are cornerstones for achieving academic and personal wellbeing. Besides, the progressive development of self-directedness and autonomy facilitated during Cognitive Education permits learners to experience positive emotions, heightened interest and engagement in activities, prepare learners to identify purpose or meaning in their work, establish positive relationships with peers, and develop greater self-determination, vitality, resilience, optimism, and self-esteem that would magnify personal wellbeing and feed into greater success academically (Huppert and So, 2009; Seligman, 2011; Teal et al., 2015; Pandolpho, 2018).

Emanating from the foregoing discussion, the authors postulate that self-directed learning is enabled by strengthening learners' ability to progressively advance at self-regulating the cognitive, metacognitive, motivational, emotional/affective, and contextual/environmental determinants that play a role in learning. The more skilled and proficient learners become at demonstrating self-regulating behavior in teacher-supervised environments, the more favorable the chances are for their being prepared to become unsupervised, self-directed learners who can autonomously reflect on and make decisions about their functioning in and dealing with various school and life-related situations.

MATERIALS AND METHODS

The Cognitive Education Intervention

Initially, the intervention was predominantly developed to equip teachers with knowledge and skills that would provide all learners with an opportunity to experience teaching and learning that would enable them to acquire the thinking skills and dispositions to become self-regulated lifelong learners and problem-solvers in the 21st century. However, on completion of the data analysis, the authors uncovered the prospects that Cognitive Education also holds for inspiring self-directed academic – and personal wellbeing. Apart from the role of social media to address the health and wellbeing challenges arising from the COVID-19 pandemic (Liu et al., 2021), the Cognitive Education intervention is an initiative that places the focus on the role of education to promote desirable behaviors directed at elevating wellbeing (Azadi et al., 2021) and contribute toward sustainable efforts that could bolster

and strengthen learners' self-directed behavior to affect their wellbeing (Paulson et al., 2021).

The design and implementation of the intervention were underpinned by the pillars of Cognitive Education, namely teaching FOR, OF, and ABOUT thinking (see **Table 1**). The heart of the intervention encompassed the modeling of the following teaching strategies to the in-service teacher participants to develop the thinking skills and dispositions to promote self-regulated action, namely, Thinking Maps (Hyerle, 2014), De Bono's thinking hats (Evans and Carolan, 2014), Habits of Mind (Costa, 2009; Anderson, 2010), cooperative learning (Booyesen and Grosser, 2014), the Q-Matrix (Wiederhold and Kagan, 2007), problem-based learning (Hmelo-Silver, 2004), and Bloom's revised taxonomy (Kratwohl, 2002). The application of all the strategies initially involves a teacher-regulated environment to encourage the development of thinking skills and dispositions to employ during learning that could be beneficial for ensuring the planning, monitoring, and evaluation of conditions associated with the cognitive component of self-regulated learning. Gradually, as learners develop more confidence in applying the strategies independently, it is hoped that the teacher-directed learning environment will be replaced with a learner-regulated environment that allows learners to independently apply the acquired thinking skills and dispositions to plan, monitor, and evaluate their learning. Although each of the strategies presents several strengths and weaknesses for enabling self-directed learning, the strengths of each strategy for enabling self-directed academic and personal wellbeing will be singled out.

Thinking Maps involve the visual application of eight important cognitive processes that are required for effective self-directed learning that ensures positive engagement and the making of meaning across any subject field (Hyerle, 2014). Each Thinking Map represents a different cognitive/thinking process. These processes are: defining in context (to label or to define), describing qualities, properties, characteristics or attributes, to compare or contrast – looking for similarities and differences, to classify, categorize and group, to identify part-whole relationships, to sequence and order, to identify cause and effect relationships, and to identify analogies (simile, metaphor) (Hyerle, 2014). Learners learn how to independently select and construct appropriate Thinking Maps during learning, which, according to the authors, encourages academic wellbeing by promoting autonomous and self-directed engagement during learning. Learners who become successful at independently selecting and applying the thinking processes encapsulated in the Thinking Maps could achieve greater success in their academic work which could impact their self-esteem and feelings of self-efficacy, as well as raise the levels of enjoyment experienced during learning, thus contributing to their feelings of emotional wellbeing.

Through the use of purposeful questioning the six thinking hats strategy enhances the flexible use of different modes of thinking (factual, evaluation, critical thinking, creative thinking, synthesis, and argumentation) to self-direct positive learning engagement. The different modes of thinking are connected to a specific color hat, and learners practice the various modes

TABLE 1 | Structure of the cognitive education intervention and its relevance for enabling self-regulated and self-directed learning.

Study units of the Cognitive Education Intervention	Relevance of the study units for enabling self-regulated and self-directed learning
Study unit 1: Conceptualizing Cognitive Education/the explicit teaching of thinking	
Outcomes: Define and explain what is meant with cognitive education/the explicit teaching of thinking by clarifying the differences between teaching for, of, and about thinking	Enhancing teachers' understanding of how Cognitive Education advances self-regulated learning that, when encouraged continuously, would enable greater self-directed action
Study unit 2: The importance of Cognitive Education	
Outcomes: (i) Outline and provide examples for the importance of explicit and purposeful cognitive education and for preparing learners to cope with life after school and with the challenges of the new millennium. (ii) Investigate and motivate the importance of cognitive education for implementing the Curriculum and Assessment Policy Statement (CAPS) in the context of South Africa	Sensitizing teachers to recognize the importance of Cognitive Education across the school curriculum for promoting the skills and dispositions learners require to become self-regulated and self-directed learners
Study unit 3: Cognitive development processes	
Outcomes: (i) Identify and classify the processes and characteristics of cognitive development: from toddlers to adolescents to adults. (ii) Recognize how the characteristics of cognitive development influence instructional design in the classroom	Making teachers aware of age-related cognitive demands when planning instruction that aims to enhance the skills and dispositions learners require to become self-regulated and self-directed
Study unit 4: A mediated learning approach to advance Cognitive Education	
Outcomes: (i) Understand and apply the theoretical principles of mediated learning during teaching to advance cognitive development. (ii) Compare the application of a mediated learning approach with traditional transmission and reception teaching	Providing teachers with a theoretical framework consisting of twelve criteria for embedding their teaching and creating learning activities that would ensure the development of the skills and dispositions learners require to become self-regulated and self-directed
Study unit 5: The thinking school and the thinking classroom	
Outcomes: (i) Determine ways to create a "Thinking School" and distinguish factors that can hamper the journey in becoming a "Thinking School." (ii) Manage the implementation of a thinking approach across classrooms in schools and colleges. (iii) Clarify the role of the teacher in establishing a "Thinking Classroom." (iv) Identify and eliminate factors that can hamper effective thinking and learning in the classroom and at home	Teachers are provided with practical suggestions of how to create a classroom climate and an environment that invites the development of the skills and dispositions that self-regulated and self-directed learners require
Study unit 6: Approaches/strategies/activities to teach thinking skills and dispositions	
Outcomes: (i) Understand, apply and infuse a variety of teaching approaches/strategies into ongoing teaching and learning activities to enable learners to acquire learning content at the different cognitive levels of Bloom's revised taxonomy, as envisaged in the objectives of the CAPS curriculum (Strategies modeled to the teachers: De Bono's six thinking hats, The Q-Matrix, Problem-based learning, Thinking Maps, Cooperative learning, Habits of Mind, and Bloom's revised taxonomy (ii) Evaluate the effectiveness of a specific teaching strategy/activity to advance skills and dispositions	This unit comprised the practical part of the intervention and constituted the part on which the research reported in this article, focused Seven teaching strategies that develop the skills and dispositions required of a self-regulated and self-directed learner were modeled to the teachers As part of the practical component of the intervention, the teachers applied the various strategies in their classrooms, after which data were collected to establish the merits and demerits of the strategies to advance the development of skills and dispositions required for enabling self-directed learning
Study unit 7: Cognitive principles and assessment	
Outcomes: (i) Understand the principles of Bloom's revised taxonomy for teaching, learning, and assessment to allow learners the opportunity to become cognitively engaged	Teachers were guided in recognizing the merits of Bloom's Taxonomy not only for directing assessment but also for directing teaching that would advance the development of the skills and dispositions required for self-regulated and self-directed learning

of thinking by switching to the different colored hats during teaching (De Bono, 1992; Evans and Carolan, 2014). The six hats strategy makes it possible for learners to gradually through self-questioning, further their immersion and engagement in discovering depth in their thinking about subject content that could advance a better understanding of information that is likely to impact academic achievement favorably and in turn, elevate feelings of academic wellbeing and stimulate positive emotions related to self-efficacy, and pleasure and enjoyment in learning.

The Habits of Mind strategy (Costa, 2009; Costa and Kallick, 2009) plays an important role in the development of important intellectual dispositions/attitudes and positive emotions whilst engaged in learning, thinking, and decision making. Habits of Mind refers to mindsets or mental and emotional moods

that enhance the quality of task completion, decision making, and problem-solving in any context, thus being beneficial toward academic and personal wellbeing. According to Costa and Kallick (2009), the Habits of Mind can be clustered according to five groups, all of which aim to further self-directed action namely: (i) *resilient* that involves being able and willing to persist, work, and communicate with accuracy and precision. Resilient behavior capacitates one to not easily get overwhelmed, weary and pessimistic when faced with personal crises and academic challenges, but without support navigate toward gathering resources to overcome crises and challenges, therefore possibly advancing psychological wellbeing by inspiring feelings of adequacy and personal growth; (ii) *resourceful* – being resourceful involves being creative, flexible, innovative,

and open-minded in self-governing the elimination of obstacles that obstruct academic and personal wellbeing that likely will contribute to feelings of self-determination and autonomy as attributes of psychological wellbeing, and self-efficacy as an attribute of emotional wellbeing; (iii) *reasoning* that comprises the ability and preparedness to engage in metacognitive self-reflective and self-regulated action that is foundational to self-direct the planning, monitoring, and evaluation of behavior and decision making required to promote academic and personal wellbeing; (iv) *reflective* that refers to the unsupervised ability to eagerly discover humor, react with wonderment and awe, and to remain open to learning, that could consequently boost energy, curiosity, enthusiasm as attributes of academic wellbeing, and meaningfulness as an attribute of emotional wellbeing; and (v) *responsible* that includes a keenness to ensure the quality of one's work by avoiding impulsiveness, a desire to be empathetic and understanding, and open to collaboration and taking calculated risks. Academic success might increase from a responsible disposition toward one's work, subsequently advancing academic wellbeing. Social wellbeing could flourish by encouraging collaboration that promotes social inclusion and connectedness. Finally, emotional and psychological wellbeing could thrive when risk-taking leads to goal achievement that bolsters self-efficacy and personal success, respectively.

Cooperative learning plays a role in developing the social dimension of personal wellbeing, or the nurturing of positive relationships during learning. Social interaction creates opportunities for learners to learn how to engage in the autonomous cognitive processing of information that cultivates academic engagement, the development of self-confidence in one's independent efforts, receiving emotional support from peers, experiencing a sense of belonging, and being part of opportunities to share, evaluate, and communicate information with clarity and precision (Booyesen et al., 2017). A better understanding of information due to active and collaborative engagement during learning that could be considered as an outflow of cooperative learning could in all likelihood contribute to greater academic accomplishment that could effectuate academic wellbeing. Academic wellbeing on the other hand could advance feelings of personal success, autonomy, self-esteem, and self-efficacy as facets of psychological and emotional wellbeing. Additionally, engaging in social learning allows learners to experience social inclusion, acceptance, and connectedness as well as the acquisition of important dispositions such as empathy, humility, and open-mindedness (Johnson and Johnson, 2006; Booyesen et al., 2017).

Problem-based teaching is learner-centered teaching and learning, and learners autonomously learn about a subject by doing independent problem-solving in collaboration with others. The goals of problem-based teaching are to help the learners develop flexible knowledge, effective problem-solving skills, the ability to self-direct learning, effective collaboration skills, and intrinsic motivation (Hmelo-Silver, 2004, p. 235). Besides, learners develop skills and dispositions to critically and respectfully engage with others in meaningful dialogue about various knowledge claims and communicate their views with clarity and precision (Costa and Kallick, 2009). The

authors maintain that problem-based teaching could therefore contribute to presenting learning opportunities through which the aforementioned skills and dispositions would likely contribute to qualities of academic as well as psychological, social, and emotional wellbeing. Some of these qualities refer to experiencing learning as meaningful, autonomous decision making, mastery of knowledge, social connectedness, positive attributes to work with others, and the recognition of one's contribution that reinforces self-esteem.

The Question Matrix (Q-Matrix) encourages learners to think and act critically about the information they are processing by varying the questions posed to learners, thereupon creating opportunities for deeper meaning-making and understanding of information that may be beneficial to supporting academic wellbeing. Developing a questioning attitude signals self-determined involvement in mastering learning material in learning that hopefully contributes to experiencing learning as a meaningful and purposeful building block to foster academic and psychological wellbeing. Literal questions that expect learners to identify facts taken from information are posed by using question words such as when/what/where is? and when/where/who did? Additionally, questions such as what/when/where can? or what/when/where would? encourage inferential thinking. Finally, extended questions are asked that expect learners to add information to what they read, namely: what/where/when will? or what/where/when might? (Wiederhold and Kagan, 2007).

The intervention guided the teachers to connect the theory behind the cognitive process levels of Bloom's revised taxonomy to the teaching of specific subject content (Ormell, 2019), thus moving beyond using the taxonomy as a theoretical tool to guide the assessment of teaching activity. Teachers are steered to let the cognitive levels in the taxonomy become the driving force of teaching so that learners are empowered to acquire depth of thinking about subject content before the assessment of thinking (Booyesen et al., 2017), and in all probability empowering learners to achieve improved academic performance. The authors believe that acquiring a greater depth of thinking about subject content could build up to improved academic success and mastery of subject content testifying to academic wellbeing. Academic wellbeing in turn could further feelings of self-esteem and personal success; contributing to individually improved emotional and physical wellbeing.

Presentation of the Intervention

The North-West University, South Africa, and the South African Council for Educators' accredited the intervention at Level 6 of the National Qualifications Framework Level (Level 6 is equal to obtaining National Diplomas and Advanced Certificates), for which teachers received 25 continuous professional development points and a certificate endorsed by the North-West University on the successful completion of the intervention. The intervention comprised a 40-h facilitated theoretical component that consisted of seven study units, each with a self-directed, practical performance-based assignment (seven assignments in total that included 40 h of practical work) that had to be completed and passed with 50%. A prescribed textbook edited by Green(ed.) (2014) supplemented the

intervention material contained in a comprehensive study guide. The practical assignments expected of the teachers to apply what they acquired during the theory sessions in their classrooms and to submit evidence thereof for assessment purposes. **Table 1** summarizes the material covered during the intervention and clarifies the relevance of the various study units for enabling self-regulated and self-directed learning.

On a rotation basis, six cognitive education specialists were responsible for the facilitation of the intervention content to the teacher participants. Lectures were presented to the teacher participants by employing the strategies that were included in the intervention material. In other words, the facilitators modeled to the teachers what is expected of a teacher in the classroom who is serious about adopting a cognitive approach to teaching. Also, reflective questioning was used to encourage the teachers to think deeper about the information presented to them, and to prompt them to scrutinize their answers to the questions posed to them during the facilitation sessions for clarity, depth, relevance, and completeness. Collaboration stood central to the implementation of the intervention. Teachers were often requested to work in groups or pairs, as teachers had to be sensitized to the importance of the social nature of learning for the development of the thinking skills and dispositions required for self-directed learning. Although the intervention is specifically aimed at enabling self-directed learning among learners in a classroom, the intervention exposed the teachers to a training opportunity that also focused on the development of their ability to self-direct their learning in preparing for the facilitation sessions and in making decisions regarding the application of the information required during the facilitation sessions to their practical assignments.

Research Methods and Data Collection Instruments

The research comprised qualitative, phenomenological research that gauged participants' immediate experiences (Leedy and Ormrod, 2013) after the intervention using 1-h individual, semi-structured tape-recorded interviews. Semi-structured interviews allowed the teachers to reflect in an unstructured way about the questions that were phrased with a specific purpose (Prior, 2020). After the completion of each study unit, participants were requested to write reflections detailing the benefits that the training material held for enhancing the quality of their teaching practices.

Research Participants

The authors made use of non-probability sampling and approached in-service teachers who would be willing to take part in the intervention. A heterogeneous group of willing in-service, experienced and inexperienced White and Colored (Coloreds are a multiracial ethnic group native to southern Africa) female teachers from two public primary schools ($n = 12$), one private primary school ($n = 3$), and one pre-school ($n = 2$) in South Africa formed part of the intervention training. None of the teachers had previous exposure to training in Cognitive Education. The participant numbers were limited due to the intensive nature of the intervention, and to ensure more

reliable findings concerning the effectiveness of an intervention (Mouton, 2009).

Rigor

To ensure the rigor of the data analysis and the findings of a qualitative study, the authors considered criteria for credibility, dependability, confirmability, and transferability (Lincoln and Guba, 1985). The authors ensured credibility by obtaining data saturation and providing a thick description of what transpired from the data. To uphold credibility, dependability, and confirmability, and inter-rater reliability, all three authors were independently involved in the open coding, axial coding, and identification of themes and sub-themes for specific sections of the data on a rotation basis to make comparisons for agreement. The use of existing codes from the literature focused and guided the coding process, and on the account of the authors, contributed to reducing disagreement about the selection of codes. Similarly, all authors were involved in identifying and verifying the trends that emanated in the written reflection data to ensure that interpretations were based on empirically grounded data and not personal insights, thus discouraging researcher bias (Lincoln and Guba, 1985; Creswell, 2009). The authors presented detail about the biographical variables and context of the participants, to allow judgments about transferability to be made by researchers who wish to duplicate the research in other contexts with participants who have a similar background.

Data Analysis Procedure

A deductive and an inductive thematic content analysis approach was used to analyze the interview data. The voice recorded data were transcribed verbatim, and the verbatim data were scrutinized to obtain impressions of depth in the data, followed by open-coding segments of the data; thus looking for concepts and ideas in the participants' responses that answered the interview questions. For this purpose, the authors worked deductively as they identified existing codes from the literature review about cognitive education, and self-directed academic and personal wellbeing (Nieuwenhuis, 2016) that were brought into connection with the verbatim data. The authors, however, remained open to discovering unexpected and interesting codes inductively from the data that might reflect new insights and enrich the set of deductively identified codes. The existing codes from the literature that guided the coding process comprised the following aspects, namely evidence of (i) the types of thinking abilities or thinking skills displayed by learners; (ii) the qualities of the teachers' teaching and the classroom environment; (iii) the dispositions, attitudes, and values displayed by the learners; (iv) teachers' attitudes and beliefs about their role during teaching; and (v) the role that learners play during teaching. An unexpected and surprising code that the authors did not anticipate related to the enhanced emotional wellbeing of the teachers, discussed as Theme 4 in the section "Results."

After the open coding, axial codes were created by listing all the open codes and grouping similar and recurring open codes with a suitable label. Axial coding made it possible to

uncover explicit links between the data. The process was iterative and relied on a constant comparison of the various axial codes. Similar or related axial codes were color-coded, which provided the authors with an indication of possible core emergent themes; patterns in the data that came up repeatedly (Merriam, 2009). Within each of the themes, sub-themes that shared the same focus as the theme, but emphasized a specific element concerning the theme, were constructed. The themes and sub-themes that emerged from the data are highlighted in the section “Results” of the article, and appropriate verbatim extracts from the data are included to illustrate and substantiate the themes (Prior, 2020, p. 548).

The data obtained with the written reflections were wide-ranging, which complicated the determination of themes. Consequently, the authors decided to quantify major trends that reflected predominantly positive or negative opinions in the data (Villez, 2014; Nieuwenhuis, 2016) concerning the three questions posed to them. The trends enabled the authors to spot the benefits of the intervention on which future implementation could be built, as well as the needs and expectations voiced by the participants after the intervention that could inform adaptations to the future implementation of the intervention.

Ethical Clearance

Ethical clearance was obtained from the university where the research was conducted. Informed consent was obtained from all the participants before the research commenced, where they confirmed that they understood what the research was about, why they were selected, and what their involvement would entail. Participation in the research was anonymous and voluntary and participants were assured that their responses would be treated confidentially.

RESULTS

Of the thirteen interview questions posed to the teacher participants, responses obtained for three of the questions related to structural and logistical matters, and are not included in the section “Results.” The responses obtained for the remaining questions that directly align with the focus of the article could be clustered according to five main themes and their related sub-themes. All questions posed to the participants purposefully did not emphasize the role of Cognitive Education toward developing self-regulated or self-directed academic and personal wellbeing to stay clear of steering participant responses to what the authors hoped to derive from the participants’ perceptions.

Themes Extracted From the Interview Data

The authors postulate that Cognitive Education could be regarded as a key to encouraging self-directed academic and personal wellbeing. For this reason, it was important to establish whether the responses of the teachers to the different interview questions supported the authors’ reasoning.

Theme 1: The Participants’ Understanding of Cognitive Education After the Intervention

The understanding of the teachers pointed to the development of specific thinking skills which was considered as a sub-theme to qualify the understanding of the teacher participants. The following are examples of the most relevant responses to support the deductions made by the authors.

The Development of Thinking Skills

From the responses, it was encouraging that the understanding of all the participants revealed that they understood Cognitive Education to involve the development of thinking skills to promote independent, critical, and self-reflective thinking that is important for self-directed learning and daily life problem-solving. Teaching should therefore involve more than just the acquisition of factual knowledge.

The intervention motivated learners to *think for themselves* (P: 6; P: 12)¹. The learners acquired more than just knowledge, they acquired *different thinking skills and processes to apply. . . in real life* (P: 8), processes that they can use to *solve problems* (P:10; P: 12). *processes they use daily* (P: 10). Also, the intervention enabled learners to *master skills to think, communicate, [and develop] social skills rather than knowledge only* (P: 17), as well as *promote critical thinking* (P: 13).

Cognitive Education encourages independent and creative thinking and reduces rote learning: *Cognitive education is where the child’s thinking needs to be developed and it is good if the child can think on his own and give his own ideas for what he should do* (P: 11). Cognitive Education makes it possible for learners to *think further, to be able to apply thinking to daily lives*. Cognitive Education focuses *not only knowledge or rote learning* (P: 11).

Reflecting on the responses, the authors carefully conclude that the understanding of the teachers testify to the possibilities that Cognitive Education holds for developing thinking skills that are required to facilitate self-directed learning.

Theme 2: Understanding the Effect/Influence of Cognitive Education

After the intervention, all the teachers’ understanding of the effect of Cognitive Education pointed to the acquisition of thinking skills, in particular, skills such as creative, analytical, reflective, and evaluative thinking that testify to deeper levels of thinking. The authors argued that the effect of Cognitive Education on deep-level thinking could be reported as a sub-theme concerning the teachers’ understanding of the effect/influence of Cognitive Education.

Cognitive Education Promotes Deeper Levels of Thinking

Some of the most relevant responses cited the following: Deeper levels of thinking refer to more than just the acquisition of facts, it refers to *encourag[ing] learners to think deeper and to apply facts*.

¹Verbatim transcripts are placed in cursive font, linked to a participant (P) and the number (6) allocated to the participant during the research is indicated. To ease the flow of the text, and to link the various verbatim responses with one another the authors placed their own wording in block brackets. The verbatim words of the participants might contain language and spelling errors, as the original interview responses were reported.

It is preparing learners for life (P: 5), to know how to make choices (P: 6), and to be quick to find solutions to problems (P: 8).

Another sub-theme identified in the data addresses the beneficial role that Cognitive Education seems to play in the development of critical and creative thinking.

Cognitive Education Promotes the Development of Critical and Creative Thinking

Skills that drive critical and creative thinking processes such as analysis, evaluation, and reflection, likely benefit from Cognitive Education. The teacher responses confirmed that Cognitive Education enables metacognition, namely *thinking about [one's] own thinking, [how] to analyze and to reflect, to have insight in [one's] own thinking processes*. Learners learn how to *evaluate it [knowledge], and then reflect on it [knowledge] (P: 17)*. Cognitive Education makes it possible that [learners] *can think outside the box and think higher and think beyond what they really think (P: 17)*, and *not think in just one direction (P: 10)*. Cognitive Education has *ways and means to help children to use thinking skills in creative ways to achieve academic success, to perform better, to think for themselves (P: 12)*, and to *start thinking differently to what other people do (P: 14)*.

On the account of the authors, teachers' understanding suggests that Cognitive Education could advance self-directed learning, by activating deeper levels of thinking and stimulating the development of critical and creative thinking abilities that hold value not only for an academic context but also for dealing with challenges and personal crises in real-life situations, consequently building capacity to enable academic and personal wellbeing.

Theme 3: The Effect of the Intervention on Teachers' Attitudes and Beliefs About Teaching and Education

From the perceptions of all the participants the authors deduced one important message that could be viewed as a sub-theme, namely that the intervention enabled a more flexible and differentiated teaching approach that allowed greater learner involvement during teaching.

Promoting Flexible and Differentiated Teaching and Education

The strongest evidence for supporting the messages that attest to promising possibilities for enabling self-directed learning geared toward academic and personal wellbeing includes the following examples. Cognitive Education increases learner involvement: *I always thought it was the teacher that needs to do all the talking and learners should listen. Everything should actually revolve around learners and not only the teacher talking. Learners should also give their input (P: 5)*. Greater learner involvement also seems to contribute to engaging learners in thinking activities: *[the intervention] allow[s] the children to think creatively and think about their thinking (P: 16)*.

Additionally, teachers feel they have acquired strategies to accommodate different age groups during their teaching: *I learned how to use [teaching] strategies at the level of young children. The way I present my lessons is more challenging. I have realized that you can teach thinking to young learners (P: 8)*. Cognitive Education also makes it possible to cater for

different ability groupings: *[I] focused more on three groups in my class, academic strong, average, and learners with learning problems (P: 11)*.

Teachers seem to have become more thoughtful about their teaching practices: *[I] think about [my]own teaching practice and its relevance, we as teachers should change, and ways are available to look at teaching and learning differently (P: 10)*. Teachers realized that with different teaching strategies at one's disposal teaching can be presented in different ways to assist all learners to be more successful academically: *I think more about my daily planning and how to treat different learners to perform better (P: 12)*; and *[how] to use a variety of methods to teach all children (P: 16)*.

In comparison to the present curriculum according to which the teachers plan their teaching, one response testified that the Cognitive Education intervention allows more flexible teaching: *I see how fixed our curriculum is. It is not flexible at all. I also see how teaching is all about the content. The direct approach. It's all outcomes-based with results. It really is just all results-driven and I have learned so much from this course. I knew it was wrong but just to hear from professionals how wrong it actually is, changed my attitude (P: 13)*.

Applying a differentiated and flexible approach to teaching offers extended opportunities to all learners that could stimulate increased involvement as well as increase motivation and enjoyment during learning, subsequently presenting a stronger foundation on which academic success can be built and emotional wellbeing reinforced.

Theme 4: The Effects of the Intervention on Teachers

Overall, the intervention appeared to have positive effects on all the teachers who took part, and they reported increased competence, self-confidence, self-efficacy, and motivation after completing the intervention. The aforementioned attributes attest that teachers' emotional wellbeing was fueled by the application of the teaching strategies they acquired through the intervention. Some of the most significant responses presented the following evidence as part of a first sub-theme.

The Cognitive Education Intervention Enhances Teachers' Emotional Wellbeing

The empowering effect of Cognitive Education for increased teacher competence, self-confidence, self-efficacy, and motivation seems to have some positive outcomes for the teaching practices of the teachers: *I feel I'm much more equipped to teach. . . . in the sense of leading a child with that what teaching for, of, and about thinking [is]. So I think my competence has changed, and I have more self-esteem in class (P: 7)*; *my increased ability and self-confidence empowers me, and my self-confidence improved a lot (P: 13)*.

The empowering effect experienced by the teachers maybe have a beneficial outcome for learners too concerning elevated interest in learning and optimizing potential: *The children have become more confident in the way they relate to my teaching. They [the learners] find the lessons more interesting, as I am able to make the lessons more interesting. I can present a lesson in different ways. Previously I used one strategy in a lesson. I am more*

competent and it places me on another level (P: 8). I can add value to learners who struggle to reach their potential; and help them to optimize their potential (P: 10). It [the intervention] made me a better teacher (P: 11).

Deemer (2004) contends that if teachers experience a greater sense of confidence, motivation, and efficacy during teaching, they provide more effective classroom instruction, resulting in increased learner motivation and academic performance and success, and in the view of the authors, consequently strengthening learner academic and personal wellbeing.

Some participants made mention of the fact that their undergraduate training did not equip them with the strategies that they were taught during the intervention, and therefore recommend the intervention as important for in-service teachers: *We were never taught these strategies at varsity. New teachers too who do not know all the concepts can benefit (P: 3). This course is a must for in-service teachers to develop themselves (P: 8). Teachers do not know all these strategies to make teaching more interesting. Our training [undergraduate training] did not equip us with all these tools (P: 14).*

Theme 5: The Effects of the Intervention on Teachers' Classroom Practice and Learner Development

Following the teachers' responses, the teaching strategies acquired during the intervention in all likelihood hold benefits for teaching practice and the learners' involvement in the classroom. The benefits toward teaching practice eluded to an important sub-theme extracted from the data, namely being able to create quality teaching and learning environments that support learner engagement and learner development during learning.

Creating Quality Teaching and Learning Environments That Support Engagement During Learning

The most remarkable responses for the effects of the intervention on teachers' classroom practice and learner development captured the following information:

Learner engagement and enthusiastic involvement during learning were fostered. Learners also tend to be more disciplined and pay better attention during teaching, take part, and stay involved during teaching. The following responses were cited by the teachers: *Children have become more engaged in learning. Learners have definitely become more involved. Children who were wandering off during teaching are now more focused. Learners are more involved and contribute in class (P: 3). In particular, learners who were seemingly uninvolved during teaching tend to start to take part more (P: 14). One participant observed that learner discipline and [their] listening skills have improved (P: 11). Greater engagement seems to promote more attentive and focused learning: It is as if learners are more awake (P: 5), very excited and curious (P: 8), find the lessons [in class] more interesting (P: 8), and enjoy it [the lessons] even more (P: 12).*

The use of the different teaching strategies *creates energy and enthusiasm in the classroom (P: 11), and learners are eager to learn (P: 8). There appears to be an increased willingness to learn, as learners have become open to talking during learning and are enthusiastic (P: 8), are excited to work with the strategies, and love to do discussions linked to the six hats [teaching strategy]*

(P: 8). What appears to be advantageous is that the variety of teaching strategies makes it possible for learners to achieve learning outcomes in different ways, therefore appealing to a wider range of learner interests, thus avoiding weariness among learners, as mentioned by one teacher participant: It seems as if learning becomes easier (P: 12). There's a lot of different approaches so nobody is bored with one particular way something is done (P: 13). The learners are all achieving because somehow getting to the outcome through different methods is beneficial. There are many ways to skin a cat. The learners have self-confidence because there isn't just one particular way and they are finding it more interesting (P: 13).

Also, independent thinking which comprises higher-order thinking, creative thinking, and metacognitive skills for self-assessment, reflection about work, and monitoring of work was likely stimulated and encouraged with the application of the teaching strategies.

Advancing Independent Thinking

The Cognitive Education intervention aims to encourage autonomous thinking and learning. In this regard, the teachers reported the following: *I am amazed at how their [the learners'] thinking grows if you lead and guide them (P: 5). They [the learners] love the new way of working and are positive, and eager to learn on their own (P8). The learners start thinking at a higher level (P: 10), and [display] deep and profound understanding (P: 8). The teaching strategies enable the learners to acquire thinking in a creative manner (P: 5).*

An encouraging finding concerns the use of Bloom's Taxonomy as a teaching tool not only as a tool to guide assessment. Incorporating Bloom's Taxonomy as a teaching tool seems to advance the observed, independent deeper levels of thinking. Two teacher participants alluded to the potential of using Bloom's Taxonomy as a teaching tool: *Also, with the tree of Bloom's taxonomy, what I love about the learners is that they sort of know if we are now on the knowledge level or are we now going to the understanding level and they like to see where they [are] regarding the different [thinking] levels and they also start to pose questions, you know, based on the different [thinking] levels (P:13). Another teacher reported using Bloom's Taxonomy during teaching to make sure that learners go to different thinking levels (P:10). Apart from Bloom's Taxonomy, the six thinking hats and Thinking Maps strategies probably also encourage independent thinking, as communicated by the following teachers: *The Thinking Maps help learners to always think about their thinking, to better understand their thinking (P: 16). The six thinking hats and Thinking Maps stimulate creative thinking (P: 8).**

How learners responded to teachers' questions bears witness to deeper thinking before answering the questions, as the learners were starting to give more *extended answers (P: 8). Moreover, learners were purposively confronted with questions to make [them] think and let them answer questions instead of [the teacher] answering it [the questions] (P: 8).*

Concerning the skill to engage in self-regulated, metacognitive, and reflective action during learning, learners reportedly *have started to check and monitor their own work (P:*

13). Learners displayed autonomy by enacting *self-assessment and self-reflection and they've started setting little goals for themselves for where they are now and where they want to be*. The prior mentioned evidence attests to an improved ability to self-direct learning behavior.

The benefits of Cognitive Education for social learning were favorably assessed by the teachers and therefore included as a sub-theme concerning the possible effects of the intervention.

Advancing Active Cooperation and Interaction

The development of social skills for work working together with others and sharing seemed to benefit from the cognitive approach to teaching applied by the teachers. The teaching strategies open possibilities and opportunities for learners to learn *from each other* (P: 13). In particular, cooperative learning *enriches the learners because they learn from each other and not only from me [the teacher] as such and then their friends can also help* (P: 8). The learners learn not to *trust only in their own knowledge. . . [but] can use each other, it makes a difference in what they answer*. Specifically, the Thinking Maps strategy *promotes good interaction with learners* (P: 10). In general, the learners appeared to be *excited and there is more interaction* (P: 13) during teaching, and *work[ing] with and also share[ing] and pair[ing]* (P: 13) and *help[ing] each other* (P: 8) have improved.

Cooperative learning apparently encourages learners to be *more focused on thinking and writing down their own ideas, and they are not afraid to do it and they learn together, and because they are learning, they naturally reflect in the answers* (P: 17).

It can be concluded that the development of attitudes and dispositions such as respect toward others, self-confidence, self-respect, increased motivation levels, an inclination to work independently, and dispositions to enhance the quality of work, such as being eager, more focused, managing impulsivity, accuracy, persistence, and being open-minded to the opinions of others in all probability benefitted from the cognitive approach to teaching. For this reason, the development of attitudes and dispositions could be considered as a sub-theme that encapsulates another effect of the Cognitive Education intervention.

The Development of Attitudes and Dispositions

The Habits of Mind strategy was found to particularly benefit the development of attitudes, dispositions, and values toward their school work that could elevate the quality of the school work, such as accuracy, avoiding impulsivity, and persistence. *It [Habits of Mind] also teaches the learner to manage impulsivity, and focus on accuracy* (P: 8). *They [the learners] are not impulsive, wait for the task and I can see a change in their way of thinking* (P: 8) *Everyone begins to finish their work because they are keen to put in the best they can do* (P: 8).

An important dimension reflected in the data concerns the development of positive dispositions toward others and oneself: *Habits of Mind benefits the value system: respect and self-confidence. Habits of Mind develops values, respect, and consideration for the opinions of others* (P: 11), *respect[ing]. . . one another* (P: 14), *respecting each other's responses, [and] learning from each other* (P: 7), *as well as to have self-respect* (P: 5).

The importance of using the Habits of Mind strategy daily was voiced by one participant: *Habits of Mind can definitely be used daily – things like accuracy and persistence. It should not be loose standing from the other strategies. Teaching in essence is about values* (P: 14).

A final sub-theme providing evidence of the effect of the Cognitive Education intervention reflects some improvement noticed in learners' performance.

Improvement in Learner Performance

Improvement in learner performance was observed by some of the participants. *I noticed some improvement in learner achievement, as well as in their concentration* (P: 5). *Performance improved. They share with one another, learn from one another, and are able to solve problems* (P: 9). *Marks improved. I can see a change in learners' thinking and the way they approach their tasks* (P: 11). *For sure. Their performance is better, they communicate better and take part in discussions* (P: 12) *Learners are more involved and I have noticed some improvement in marks* (P: 14).

Two participants, participants 10 and 16, reacted cautiously regarding the improvement they noted in academic performance, as they, according to the authors, rightfully argue that there might be other variables that could have impacted improved performance too, apart from the new teaching strategies.

Trends Observed in the Written Reflections

The data mainly reflected positive trends concerning the three questions posed to the participants. Except for one response, none of the responses obtained were supported by half or more than half of the participants to be considered as a strong trend in the data. Therefore, without disregarding any of the responses for future adaptation to the intervention, the researchers decided to refer to particular thoughts in the data as a trend if it was supported by six or more participants. The authors concisely report the following major trends in the written reflections for the three questions.

Question 1: The Participants' Feelings About the Intervention Content

All the participants considered the content covered in the seven study units to be interesting, useful, and valuable in the context of preparing learners to cope with the challenges of the 21st century. It was disturbing that seven of the teachers noted that they did not realize the importance of stimulating the development of thinking skills and dispositions during teaching. They mentioned that the intervention enabled them to acquire knowledge and skills to enable their learners to do well.

Question 2: The Participants' Perceptions About New Learning That Took Place

For eight of the participants, the intervention provided the first exposure to become knowledgeable about the working of the brain, the importance of stimulating the brain and learning how the brain impacts learning, thinking, and learner development. Seven participants experienced the intervention as an eye-opener to how the world has changed, and how teaching has not yet

adapted to meet the challenges brought along by a changing world in the 21st century. Becoming aware of the challenges learners are faced within the 21st century made eleven of the teachers realize the importance of creating a thinking classroom in which teaching for, of, and about thinking is placed in the center. The intervention contributed to their understanding of their role as teachers to develop cognitive processes (skills and dispositions) among learners to nurture learner autonomy. Eight of the participants especially found the use of Bloom's Taxonomy as a teaching tool to be novel, and nine participants for the first time became aware of employing assessment for, of, and about thinking.

Question 3: The Participants' Suggestions for Improving the Intervention

Only one strong suggestion was made by six of the participants, namely that they wished that there was more time to receive more practical examples of how to apply the various teaching strategies to subject content that were modeled during the intervention of teaching practice change.

DISCUSSION

Important Preliminary Findings

Although the intervention was initially developed to equip teachers with teaching strategies to empower learners with the thinking skills and dispositions to self-regulate learning, evidence emerged from the research results that support the learners' progressive growth toward becoming more adept at self-directed learning as well.

The participants' understanding of Cognitive Education yielded responses that testified to the latent potential of Cognitive Education being effective for developing the thinking skills required for independent self-directed academic and personal wellbeing. In particular, critical thinking skills for making choices in daily life, such as analysis, evaluation, creative thinking, and problem-solving, skills, as well as social skills, and skills to communicate were foregrounded by the teachers. Thinking skills, such as creative, analytical, reflective, and evaluative thinking, are according to Guglielmino (2013), Barrett (2014), and Obied and Gad (2017) important for academic success and ensuring personal wellbeing. Furthermore, critical thinking skills are essential to guide the planning, monitoring, and evaluation of academic self-directed learning (Bailey, 2016; Uribe-Enciso et al., 2017; Coberley-Holt and Elufiede, 2019), as well as to self-direct the emotional/affective processes (Du Toit-Brits, 2018; Sandhu and Zarabi, 2018) that are required for ensuring academic and personal wellbeing.

If Cognitive Education encourages and enables learners to critically engage in the meaningful planning, monitoring, and evaluation of their school work, learners will most likely over time display greater ownership of, and engagement, immersion, and involvement in their school work. Additionally, greater capability to self-regulate one's work positions one to self-direct the identification and elimination of the intellectual, emotional, motivational, and environmental obstacles that may

challenge the success of one's learning efforts (Huppert and So, 2009; Du Toit-Brits, 2018; Sandhu and Zarabi, 2018), and in so doing, ensure greater goal orientation and consequently enhanced academic and personal wellbeing (Huppert and So, 2009; Lewis et al., 2011; Conley, 2014; Rimpelä et al., 2020). Subsequently, the attained academic wellbeing could contribute to increased motivation, persistence, self-efficacy, and self-confidence (Conley, 2014), as signs of greater personal wellbeing. Unfortunately, the understanding of the teachers did not reflect that Cognitive Education includes the explicit development of dispositions that are central to ensuring academic and personal wellbeing. Nevertheless, the development of dispositions among the learners was identified by the teachers during the application of the newly acquired teaching strategies.

Teachers found the intervention useful in enabling them to adopt a more flexible and differentiated approach to teaching in their classrooms, which could lay the foundation for creating positive classroom environments for enabling self-directed academic and personal wellbeing (Pajares, 2001; Booyesen et al., 2017; Fomina et al., 2020). Flexible and differentiated teaching approaches involve learners during learning and allow them to achieve learning outcomes in different ways, and from the authors' point of view, impeding frustration and boredom, and contributing to academic wellbeing.

Overall, it appeared that learners' academic and personal wellbeing benefitted to some extent from the cognitive approach to teaching applied by the teachers. The five core elements of the theory of personal wellbeing according to Seligman (2011, p. 16) doubtlessly benefitted from exposure to the cognitive approach to teaching.

Firstly, as part of positive emotions (Seligman, 2011) the data described the learners as being happy, but more than just bearing smiles on their faces. Learners became more empowered to take charge of their learning, which could have contributed to their displaying a more passionate, enthusiastic, eager, and engaged approach toward their learning, thus reflecting some characteristics of academic wellbeing (Lewis et al., 2011; Wang and Degol, 2014) and likely experiencing some degree of satisfaction and fulfillment whilst engaged in learning. The positive emotions probably lead to greater motivation, persistence, and willingness toward sustained study and task engagement (Dweck et al., 2011; Villavicencio and Bernardo, 2013; Ruppel et al., 2015), and the building of personal resources such as self-efficacy and optimism (Ouweneel et al., 2011) mentioned by the teachers. In the long run, positive emotions could promote greater study engagement to ensure better academic achievement and overall wellbeing at school (Gräbel, 2017). The detected positive emotions such as enjoyment, eagerness, and enthusiasm concerning learning that were experienced by the learners who were exposed to Cognitive Education, are all important for academic achievement (Richardson et al., 2012; Wang et al., 2015) and emotional wellbeing (Seligman, 2011). One could therefore conclude, that perhaps Cognitive Education could provide the foundation for encouraging the positive emotions that will enable academic and personal wellbeing.

Secondly, learners displayed greater positive engagement (Seligman, 2011) during learning. The discerned development of critical thinking among the learners in all probability might have inspired the self-assessment and monitoring of work as features of positive engagement referred to by Seligman (2011). The self-assessment and self-monitoring behavior might also signify some degree of competence toward self-directed leadership and autonomy during learning displayed by the learners as a result of the exposure to the new teaching strategies. The deeper levels of thinking exhibited by the learners during learning without a doubt prepared them for growing engagement during learning. It seems fair to argue, that Cognitive Education enables learners to acquire the skills and dispositions that energize learning and prevent academic burnout (Salmela-Aro and Upadaya, 2014; Rimpelä et al., 2020) that could negatively affect academic wellbeing. On the account of the authors, Cognitive Education could therefore be accepted as an approach to teaching that would enable increased self-directed participation (behavioral engagement) in learning, a positive inclination toward learning (emotional participation), and a willingness to apply stronger mental efforts to learning (cognitive participation) (Wang and Degol, 2014).

Evidence of self-directed learning is found in learners who are empowered to autonomously control the intellectual/cognitive, motivational, emotional, and contextual factors that might hamper their academic and personal wellbeing (Karademas, 2006; Ryan and Deci, 2011; Moreira et al., 2015; Sandhu and Zarabi, 2018) and cause setbacks and effort decline (Dweck et al., 2011). The development of autonomy and increased independence witnessed among the learners who were exposed to Cognitive Education could contribute to the learners developing positive self-attitudes, which, according to the data, manifested as a display of greater emotional wellbeing in the form of self-confidence that was witnessed by the teachers.

The noticed academic engagement among the learners could be viewed as a sign of academic wellbeing that was probably encouraged through the acquisition of dispositions to be more focused, involved, and open-minded during learning, as well as being more disciplined to listen during teaching, thus paying better attention. The raised level of cognitive engagement could be considered as a protective factor to ensure academic wellbeing and success (Wang and Fredricks, 2014), and life satisfaction (Lewis et al., 2011). Weariness and being pessimistic about school (Salmela-Aro and Upadaya, 2014; Rimpelä et al., 2020), helplessness (Heikkilä et al., 2010), and being avoidance-oriented (Saeri et al., 2017; Tuominen et al., 2020) as signs of academic discontent might therefore probably be eliminated when learners are exposed to continued Cognitive Education. The authors believe that improved engagement in learning enabled better understanding and meaning-making of subject content, which brought happiness and enjoyment to the learners. Therefore, enjoyment generated through the cognitive approach to education could be seen as a factor that can strengthen academic and emotional wellbeing. Also, enjoyment and engagement can energize learners to continuously pursue academic success that would enable them

to build meaningful futures after school, consequently elevating psychological wellbeing.

Thirdly, through Cognitive Education one might suggest that fostering skills and dispositions to establish social connectedness and positive relationships (Seligman, 2011) as an important element of wellbeing, is possible. Teachers detected among the learners the emergence of skills to work together with others, learners learning from others, showing respect to, and sharing with others, all of which suggest a reflection of teamwork and kindness (Seligman, 2011). The development of communication – and social skills that were mentioned by the teachers support the encouragement of positive social attitudes and connectedness toward others, which could be acknowledged as crucial to the social dimension of personal wellbeing (Olsson et al., 2013). The authors consider social connectedness as important for the provision of emotional support in challenging times. Social support can play a prominent role in providing encouragement and assistance to learners in the face of academic challenges that could negatively impact emotional wellbeing. Interacting and sharing with peers testify to increased social connectedness (Olsson et al., 2013), which is probably indicative of more positive attitudes toward others and personal behavior that in all probability will not manifest in isolation, sadness, and self-doubt (Saeri et al., 2017). For Olsson et al. (2013), social connectedness is viewed as a more important route than academic ability to ensure adult personal wellbeing.

Fourthly, meaning as an element of wellbeing (Seligman, 2011) seemed to benefit a great deal from the new approach to teaching applied by the teachers. Experiencing meaning can be associated with the teachers' observations of numerous positive traits, feelings, and behaviors such as, engagement, enjoyment, curiosity, excitement, involvement, interest, eagerness, and alertness among the learners whilst involved in classroom learning, that support the positive aspects of personal emotional wellbeing (Schimmack and Diener, 2003; Seligman, 2011; Fomina et al., 2020). The authors believe that motivation to learn, finding a sense of purpose and meaning in learning, and mastering what was learned were probably inspired by the cognitive approach to teaching. Cognitive Education in all likelihood enables the development of positive personality traits, feelings, and behaviors connected to character strength with which wellbeing is associated (Seligman, 2011).

In the fifth place, it would appear that the teachers' impressions of increased self-confidence, less impulsive working ways, persistence, self-control, self-efficacy, more accurate working ways, and self-respect among learners attest to some degree of accomplishment, the final core element of wellbeing, according to Seligman (2011). The mentioned traits also focus one's attention on attributes of personal emotional wellbeing that were probably achieved. If a strong sense of self-efficacy prevails, Bandura (2006) asserts that people can reign with resilient power over and master obstacles in the way of their self-development and life circumstances (Bandura, 2006). Feelings of self-efficacy prompt one to persist (Tompkins, 2013), and can magnify accomplishment, as well as personal wellbeing (Bandura, 1994).

Suldo et al. (2006) posit that teaching environments need to be modified to support academic and personal wellbeing, intending

to transform learners from being dependent and self-regulated (Ryan and Deci, 2011; Fomina et al., 2020), to self-directed (Kazachikhina, 2019). The application of Cognitive Education demonstrated that the classroom environment indeed mediates a positive link for enabling self-directed academic and personal wellbeing (Ryan and Deci, 2001; Ruppel et al., 2015; Gräbel, 2017; Rimpelä et al., 2020), by shaping positive cognitions and positive emotions for academic and personal wellbeing that contribute to the flourishing of character strengths associated with autonomous learning, namely, self-efficacy, self-confidence, and self-esteem (Seligman et al., 2009; Macaskill and Denovan, 2013). Over and above, the implementation of a cognitive intervention at the school level supports the reasoning of Paus et al. (2008) and Choi (2018), that childhood and adolescence are the most decisive stages for cognitive development, learning how to regulate emotions, inspiring motivation and establishing social interactions; thus laying the foundation for enabling academic and personal wellbeing at an early age.

Although the intervention probably enabled self-directed academic and personal wellbeing among learners, it was encouraging that the intervention boosted emotional wellbeing among the teachers too, as their competence, self-confidence, self-efficacy, and self-motivation were elevated due to their being empowered with a repertoire of new teaching strategies. These strategies empowered them to create quality inclusive teaching and learning environments that did not focus on a one-size-fits-all approach but were open to developing and transforming attitudes/dispositions as well as the thinking capacity among learners toward self-directed learning.

Brockett (2009), Heikkilä et al. (2010), Macaskill and Denovan (2013), and Villavicencio and Bernardo (2013) suggest that helping learners develop personal wellbeing may bolster academic achievement and self-direction, suggesting that academic wellbeing and self-direction depends on personal wellbeing. However, the authors argue that the strong reciprocal relationships between academic and personal wellbeing (as outlined in the article) rather suggest establishing an environment that encourages the simultaneous enabling of both, with self-directed learning as the vehicle to support the enabling. The experience of meaningfulness during school engagement could spark positive emotions and satisfaction that benefit emotional wellbeing. In turn, positive emotions could lead to greater immersion and involvement in schoolwork, being prepared to put in more effort in schoolwork, and experiencing school work as meaningful. Feelings of weariness as part of school burnout could ignite negative emotions as part of emotional wellbeing. On the other hand, negative emotions could manifest as a pessimistic attitude toward school, and contribute to feelings of academic inadequacy that could potentially impact one's psychological wellbeing concerning being successful and vice versa.

This research provided in-service teacher development that, opposed to the current top-down approach to professional development provided by the Department of Education in South Africa (Govender, 2015), focused on teachers being self-responsible and self-directed initiators of the quality of their teaching practices. The intervention could therefore be regarded

as holding a two folded benefit, namely: firstly, to enable self-directed academic and personal wellbeing among learners via a cognitive approach to teaching and learning, and secondly, to enable teachers themselves to self-direct and enhance their teaching practices.

Potential Shortcomings and Limitations

The fact that learners' experiences with the cognitive approach to teaching were not gauged, could be regarded as a limitation, as learner data would have enabled the authors to collect richer data that could have strengthened the data obtained from the teacher participants. Additionally, observation research would have permitted the authors to gather reliable data concerning the classroom practices of teachers to support the preliminary findings that suggest the latent potential of Cognitive Education to enable self-directed academic and personal wellbeing.

The effects of the intervention were only tracked over a short period, which makes it difficult to infer the long-term benefits of the intervention. Also, research that includes other nationalities, contexts, and learners of various ages needs to be conducted to confirm the present findings and to conclusively make deductions about the potential of Cognitive Education to contribute to the enabling of self-directed academic and personal wellbeing. Wider empirical research with diverse groups of teachers and learners needs to establish if a cognitive approach to teaching might hold situational or context-specific limitations for enabling self-directed academic and personal wellbeing.

The extent to which external factors such as ability, gender, cultural and social contexts, home environment, lifestyle, and family influence could play in enabling self-directed academic and personal wellbeing (Suldo et al., 2006), were not explored in the study. Also, a quantitative analysis of the strength of the relationships between Cognitive Education, self-directed learning, and academic and personal wellbeing would provide greater confirmation to the qualitative findings obtained.

Despite the shortcomings, the present research contributes to the theory and practice of self-directed learning and academic and personal wellbeing. Nevertheless, the authors endorse additional research in the field.

Advances and Future Directions

According to the research findings, many of the finer dimensions of personal wellbeing seemingly did not yet benefit from the intervention. In particular, it was not clear from the data how aspects related to psychological wellbeing, such as purpose in life, life satisfaction, personal growth, and self-acceptance might have benefitted from the intervention. Compared to psychological wellbeing, benefits related to academic wellbeing, and emotional and social wellbeing seemed to have been exploited more. Still, from the data, it is also not clear how dimensions of emotional wellbeing, such as resilience, self-motivation, and self-doubt might have benefitted from the Cognitive Education intervention. The aforementioned could be attributed to the exclusive focus on teaching strategies that placed explicit focus on advancing the thinking skills and dispositions to self-regulate behavior in the cognitive domain of learning. Although increased self-directed cognitive action beneficial to academic

and personal wellbeing was evident, adapting the intervention to also include teaching strategies that specifically focus on shaping self-regulated behavior concerning the motivational, emotional/affective, and contextual/environmental domains of learning could deliver more powerful gains for self-directing psychological and emotional wellbeing.

To address the mentioned gaps in the future, expand the accomplished impact, and tap into the benefits of the Cognitive Education intervention for enabling self-directed wellbeing the authors envisage undertaking a comprehensive assessment of and prioritizing the wellbeing needs of the young (Fattahi et al., 2020) for the South African context. Prioritizing the wellbeing needs for the South African context would necessitate a more purposeful consideration of a wider repertoire of teaching strategies to include in the intervention that would encourage the development of the skills and dispositions for enabling self-directed wellbeing across a wider spectrum of wellbeing needs. It would be of interest to establish whether the priority that is given to psychological and social wellbeing needs (Fattahi et al., 2020); health and physical wellbeing needs (Pouresmaeil et al., 2019; Azadi et al., 2021), and spiritual wellbeing needs (Pouresmaeil et al., 2019), also manifest as prime wellbeing needs in the South African context.

On further reflection, the authors concur that substantial attention should be devoted to adapting the material of the Cognitive Education intervention to integrate the core elements of academic and personal wellbeing with the principles of Cognitive Education. By adapting and strengthening the theoretical framework of the intervention, the finer dimensions of academic and personal wellbeing could be aligned to applicable teaching strategies that adequately enable academic and personal wellbeing in its entirety. An aspect that requires further inquiry is how and whether experiencing personal wellbeing in an academic context, as discovered in the research, might relate to experiencing personal wellbeing in daily life circumstances. Also, although the research findings pointed to some advances concerning learner performance that refer to deeper thinking, understanding, and achievement, the evidence according to the current research is not yet powerful, and the long term effects of a Cognitive Education intervention on academic performance and achievement need to be established.

Azadi et al. (2021) affirm the importance of an acceptable theoretical framework to achieve success with educational intervention programs aimed at enhancing wellbeing behaviors. Consciously embedding the design of the Cognitive Education intervention in three theoretical frameworks seemed meaningful, as beneficial research results in support of enhanced academic and personal wellbeing were offered. Expanding on the theoretical work of Teal et al. (2015) that links research in two fields, namely, self-directed learning and Positive Psychology (wellbeing), the authors aimed to present a theoretical and practical suggestion of how Cognitive Education as a theoretical foundation could bridge self-directed learning and Positive Psychology (wellbeing), thus uniting three fields that mutually reinforce and support each other, and prompt new questions to be posed and answered concerning the relationship between Cognitive Education, Positive Psychology (wellbeing), and

self-directed learning. Through the interdisciplinary connection of Positive Psychology (wellbeing), Cognitive Education, and self-directed learning new topics of investigation and practical application are illuminated.

CONCLUSION

To the authors' best knowledge, the research reported is a first and novel attempt to explore the role that Cognitive Education could play in providing the conditions for enabling self-directed academic and personal wellbeing among school learners. This research demonstrated that Cognitive Education could be regarded as a form of strengths-based education. Through the application of selected teaching strategies thinking skills and dispositions that encouraged increased self-directed action during learning were developed. The advances learners made in particular concerning the development and application of critical thinking and metacognitive thinking attest to benefits for supporting self-directed action during learning. The growth and development of dispositions such as being increasingly involved in learning, displaying a more open mindset toward the opinions of others, engaging with peers, exhibiting more empathy and respect toward peers, and persisting in more accurate task completion are some of the dispositions that are associated with progressive self-directed action. These thinking skills and dispositions served as protective factors for encouraging positive thoughts and emotions during learning, promoting positive engagement during learning, advancing social connectedness during learning, contributing to experiencing learning as meaningful, accomplishing greater success, and fostering increased self-efficacy that consequently advanced academic and personal wellbeing. The research findings disclosed the importance of Cognitive Education to affect, inspire and lay the groundwork for greater resilient and self-directed action among learners in decision making that could benefit their academic and personal wellbeing. Arguments in favor of teacher support for academic and personal wellbeing are not new, however, this research clarifies how a cognitive approach to teaching capacitates teachers to modify teaching environments that would enable learners to acquire the thinking skills and dispositions necessary to become independent, self-regulated, and eventually self-directed managers of their academic and personal wellbeing.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available on request. Please contact MG, mary.grosser@nwu.ac.za.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Basic and Social Sciences Research Ethics Committee (Ethics number: NWU-HS-2017-0036.

Project approval dates: 20-2-2017 to 20-2-2020). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MG contributed to introduction and rationale to the research, and conceptualized the intervention and who also acted as editor for the intervention material. GV and MK reviewed the literature related to Cognitive Education. MG, GV, and MK contributed to data analysis and interpretation and finalized the manuscript. GV coordinated and managed the implementation of the intervention, assisted by MK. The intervention was conceptualized by MG who also acted as editor for the intervention material. MG and MK developed the intervention. MK assisted, coordinated, managed the implementation of the intervention, and developed intervention. All authors were involved in presenting sessions during the intervention.

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Meaning of Education and Wellbeing: Understanding and Preventing the Risk of Loss of Meaning in Students

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The phenomenon of malaise is on the rise at universities, reflecting a deteriorating psychological state that is a combination of anxiety and stress factors. This psychological and emotional upheaval within students is indicative of a fundamental existential issue. In fact, hidden behind the choice of an educational program is the significance given by the student to their life goals. It is this dimension of attributing meaning to one's education and, more broadly, to one's life (the existential dimension) that we have sought to explore. We hypothesized that a stable investment in one's life goals and a sense of psychological wellbeing during one's studies could be fostered by reflective work done alongside the educational process. Our research took the form of a mixed methodological approach to the attribution of meaning to education, including an interpretive phenomenological analysis (IPA), and the experimentation of support for the meaning of education. Four dimensions of meaning were found to be observable in varying degrees in all students, each playing a specific role. Moreover, this research has confirmed that the meaning of studies is not to be understood solely in terms of education, but is part of a singular life story. Reflective work, developing meaning, facilitated by others (advisor, teacher, etc.) can help preserve/restore the feeling of wellbeing. It should be noted that, as the work presented in this article predates the pandemic, we will not address the amplifying effects of this health crisis on existential issues, which some recent studies are beginning to highlight.

Keywords: meaning of education, meaning, wellbeing, IPA (interpretive phenomenological analysis), reflexive approach, students

INTRODUCTION

Evolving in a context of multiple crises and uncertainties (Coutinho et al., 2008; Arnault, 2021), and called upon to adapt quickly to the university environment (Boujut et al., 2009) regardless of their degree of autonomy, self-esteem, and emotional stability, students react mainly (and sometimes sequentially) in two ways: by fully engaging in the acquisition of knowledge and skills deemed useful for their career life, at the cost of excelling in their work (intensive investment), or by developing negative affects — boredom, stress, fear of failure, questioning of their own choices, etc., - which can lead to disengagement or even dropping out (Falissard, 2019). How can we maintain the student's commitment or allow them to reinvest in a course that has become a source of psychological wellbeing? Considering

that future plans - which have become non-linear - are now linked to existential questions and the meaning of work (Yalom, 2008; Bernaud, 2016, 2021), it seems essential to us to help the student adopt a reflective stance toward their experiences.

Thinking and thinking about oneself in a learning situation would contribute to a better understanding of one's existence, to the development of new behaviors, less focused on the goal of obtaining a degree to the detriment of one's psychological wellbeing, and closer to oneself, one's needs, and one's priorities in life (Henderson-King and Mitchell, 2011). What kind of support could help to ensure a serene (re)investment in university education? This is the question we tried to answer in a recent Ph.D. research project based on a mixed empirical approach, taking advantage of an interpretative phenomenological approach to build a device to support meaning (Baatouche, 2020).

From School to University

Whether enrolled in initial or continuing education, the student is always a former high school student. For them, university studies will often appear to be a continuum or a renewed thread in relation to their schooling. They will nevertheless mark a break, requiring a reworking of the meaning attributed to learning.

On entering university, learning and the particular place in which it takes place still bear the imprint of the meaning previously attributed to school. This meaning of school has itself been drawn from inherited cultural capital (Bourdieu and Passeron, 1971), which is made up of parental educational practices, beliefs and values of the environment, etc.

Inherited cultural capital constitutes a mental, symbolic and cognitive tool that allows us to interpret the world in which we evolve from childhood (Baatouche, 2020). Taking a step back from our primary culture can be done at school and at university through a reflective and hermeneutic pedagogy, allowing for a distancing, a step back, a reworking of meaning (Dumont, 1968). Thus, Zakhartchouk (1999) sees the teacher as a potential "cultural facilitator," guiding the learner in a reflexive approach allowing the elaboration of a new meaning.

Furthermore, according to Paivandi (2018), the young learners entering college must transition from being a high school student to being a college student. During this transition, they are called upon to change their relationship to the object of learning, their relationship to knowledge, and their way of learning. College constitutes not only a new way of conceiving knowledge, by requiring independence and intellectual engagement, but also a space for questioning the meaning of one's education. The student must therefore undergo a real intellectual transformation.

While as a high school student, they were learning to comply with parental orders (utilitarian function) or for the pleasure of acquiring knowledge (epistemic function). Now, as a university student, they must choose a course of study based on their personal and professional life goals.

The direction, which was previously undefined or imaginary, must become clearer in order to sustain a long-term motivated effort. The student also becomes aware of a timeframe (quarter

and academic year) in which this mobilization takes place so as to empower them to take charge of their lives.

During this period of study, the meaning attributed to the learning process is transformed through interaction with the social (outside the university) and educational environment (Bloomer and Hodkinson, 2000). Learning then combines as many meanings as the number of situations encountered.

As for older students, returning to their studies, armed with experience of professional life, they are experiencing another major form of transition. This transition, often linked to their professional development, leads to a redefinition of their motivations for studying and an upheaval in the way they invest time, learning and social relations.

In the end, always marked by a cultural heritage and a life history, the meaning comes from the links that the learner weaves between their education, the environment in which it takes place, its content, past experiences (of learning) and their future plans. Major bad experiences can impregnate the meaning attributed to education, leading to malaise. The establishment of an internal dialogue between the individual as a person and the individual as a learner will make it possible to sort out their thoughts, in order to clarify what led them to choosing this course of study, in order to persevere by having attributed a new meaning to their educational plans, or to change the course of study with full knowledge of the facts.

Expressions of Malaise at Universities

Students live and search for their bearings in a fluid society (Bauman, 2013) marked by a continuum of transformations and experiencing a succession of crises (economic, philosophical, spiritual, and health). Finding meaning is all the more vital to them. According to Falissard (2019), the competitive world places students in a climate of permanent tension, resulting in either an appetite for challenge or unhappiness: stress, educational phobia, social and family isolation. Verger et al. (2010) note that approximately forty to fifty-six percent of students report a state of anxiety.

DeWitz et al. (2009) focus on students without a life plan. Being immersed in the academic environment leads them to question the meaning of their existence, developing a feeling of malaise. Therefore, students experience the university experience only through this feeling of too little existence. They focus on the passing of time and their belief in their abilities diminishes, sliding from boredom to more or less accentuated forms of depression.

The forms of unhappiness at universities are sometimes spectacular. Thus, the hikikomori phenomenon happens, voluntary home confinement which is characterized by social withdrawal, lasting from a few weeks to several years (housebound syndrome), becoming an exclusively virtual communication with the surrounding environment. This is a prevalent phenomenon in Japan where it affects 46% of students and is now also found in France (Fansten and Figueiredo, 2015). We are not referring to the confinement measures imposed, since the completion of this study, during the health crisis (also a source of isolation and discomfort for many students).

The intensity of engagement in the university environment can lead some workaholic students (Chamberlin and Zhang, 2009) to no longer meet their psychological needs. Other areas of life are neglected (Bovornusvakool et al., 2012). This overcommitment clearly detracts from student wellbeing. Libert et al. (2019) found a correlation between overcommitment (workaholicism) and academic burnout.

These various phenomena, which reflect a deterioration in the relationship with learning at the university, are often the beginnings of a complete drop-out of a student who is suffering. They can be studied in terms of meaning (Baatouche, 2021; Baatouche et al., 2021).

Meaning, a Key Determinant of Psychological Wellbeing

For Kasser and Ryan (1996), intrinsic motivation aimed at inner satisfaction (as opposed to extrinsic motivation, which is focused on materialistic goals and aims for reward) is a key factor in meaning attributed to academic training. According to the flow theory (Csikszentmihalyi and Csikszentmihaly, 1990), individuals who carry out a daily activity that is closely linked to their intrinsic motivations experience a high degree of meaning and wellbeing, enabling them to develop confidence and autonomy.

Henderson-King and Mitchell (2011) join this vision, while taking an existential approach: motivations (intrinsic or extrinsic) are linked to life experiences to which one has attributed a meaning that a reflexive approach can reveal and change.

Life events related to university learning play a role in building and finding meaning (King and Hicks, 2009). According to Gómez González et al. (2013), the meaning of education is not reduced to a search for meanings, but stems from an exploration of oneself, one's life experiences, and one's relationship with others and the world.

By facing new situations and environments, students are able to revise and refine the meaning they attribute to their education. However, this process can be perilous when support from a professional (teacher, advisor, etc.) is not provided. To encourage this metacognitive process which allows one to go beyond one's first interpretations impregnated with affects, the use of narrative and more specifically the use of the explicitation interview is recommended (Vermersch, 2012).

The explanatory interview leads the student to describe his life experience (in particular his presence in education), to observe his ways of acting and to put them in connection with his judgments, his thoughts, the influences the environment in which it operates (Balas-Chanel, 2002). This reflective posture leads the student to a reflective awareness, leading him to go beyond his implicit, to give a more objective meaning to his actions and experiences. Analyzing your experience as a spectator is not a spontaneous act. Nonetheless, learning to learn from one's life, that is to say to "thoughtful consciousness," makes it possible to give meaning to what seems to be lacking (Vermersch, 2019).

Each student can assign meaning to their education (DeWitz et al., 2009). To do so, they must have the courage to face their freedom to act, choose to reinvest the meaning of their attendance at a course in an authentic way and persevere (excelling) or revise

their plans (reinvesting themselves elsewhere), and in both cases take responsibility for it. This choice of authenticity, which comes under the heading of a work of better self-knowledge with a view to fully engage one's existence (Jaspers, 1989), proves to be a factor of wellbeing (Forest et al., 2012; Bernaud et al., 2019).

The meaning of education experienced through a reflective process in fact generates a feeling of wellbeing (Guimard et al., 2015). It should be noted that there are two forms of wellbeing: subjective wellbeing and psychological wellbeing. Subjective wellbeing is characterized, according to Diener (1984), as the sum of an affective component, a cognitive component and a feeling of life satisfaction. Psychological wellbeing, which is oriented toward an existential perspective and takes into account the way in which the individual interacts with the world, is made up, according to Ryff (1989), of six components: a perception of autonomy, self-acceptance, a perception of mastery over the environment, a degree of personal accomplishment, positive relationships with others and life goals.

Furthermore, the psychometric instrument Questionnaire for Eudemonic Wellbeing "QEWB" (Waterman and Waterman, 1972) offers an assessment of meaning as an indicator of the wellbeing of students. Tested on a sample of $N = 7,334$ students, it consists of four items related to the notion of wellbeing.

OBJECTIVES AND HYPOTHESES

September 2018 through January 2020, we conducted a study whose main objective was to analyze and understand, from an existential perspective, the psychological resources that students can activate in order to attribute meaning to their training. Our wish was to propose to professionals an approach to vocational guidance centered on meaning and reflexivity.

We postulate two hypotheses:

Hypothesis 1: Seeking the meaning of an education through a reflective guidance would increase the student's sense of psychological wellbeing by promoting more authentic choices.

Hypothesis 2: A reflective approach to one's life experiences would enable the student to clarify their choices and attribute a high level of meaning to their education.

To verify our hypotheses, we chose to conduct two-phase research: an analysis phase and an experimental phase (Baatouche, 2021). The first phase consisted of exploratory research conducted on a sample of five students, based on an interpretative phenomenological analysis (IPA). The objective was to identify, through an analysis of life experiences and in particular learning experiences, the meanings attributed to the education. Then, questioning the impact of an accompaniment to the meaning on the serene (re)investment of the university formation, we elaborated and tested a device of reflexive accompaniment, by constituting two independent samples of students, allowing a comparison (experimental sample $N = 32$ and control sample $N = 11$). Then, examining the mode of guidance in the sense that could enable a serene (re)investment

in university education, we developed a reflective device with two independent samples, making a comparison possible (experimental sample $N = 32$ and control sample $N = 11$). The objective of this second phase was to measure the effects of reflective guidance on the development of meaning in life and education, vocational choices and wellbeing.

METHODOLOGY

Choosing a Mixed Approach

In order to shed light on the meanings that a student attributes to their attendance in education, we chose a qualitative method: the interpretative phenomenological analysis (IPA). This methodology which uses autobiography, promotes a process of objectification by gradually taking a distance. This movement allows the student to shed old meanings (linked to beliefs and presuppositions) and the affects that accompany them. The process thus makes it possible to approach the student “authentic individuality” (Husserl, 2004).

Originating in the therapeutic field and recently used in guidance research, IPA is an inductive method for understanding complex psychological phenomena (Smith et al., 2009; Baatouche, 2020; Bernaud, 2021). IPA, which uses the semi-structured, in-depth interview as a technique, requires the researcher to shed presuppositions and position the participant as co-researcher, having his own knowledge of himself. In this, this innovative approach differs from other meaning exploration methodologies, such as the Family Semantic Grid (Ugazio et al., 2018). Indeed, during the IPA, meaning themes are not pre-existing to the interviews; they are determined by the very content of the interviews.

In the end this approach has proven to be very appropriate in order to closely examine the major experiences that generate wellbeing or malaise; to better understand the meaning that the student attributes to his presence in education. To encourage this metacognitive process, the use of narrative and more specifically the use of the explanatory interview is recommended and to their existence, and to enable them to transform this meaning.

In addition to the individual IPA interviews, we then set up quantitative research based on the results of experimenting with an innovative method of support for the meaning of education. This method, entitled Meaning of Life - Meaning of Education (SVSF), was previously developed based on two methods of guidance, Meaning and Life Goals (Gómez González et al., 2013) and Meaning of Life, Meaning of Work (Bernaud et al., 2015).

Our Meaning of Life, Meaning of Education (SVSF) program, consisting of five group sessions and three individual interviews (approximately 22 h total), is an innovative approach to supporting meaning and plans through its reflective and pedagogical methodology [a hermeneutic approach, based on exchanges between peers and with the facilitators and on a personal, confidential logbook designed to record one's thoughts (Baatouche et al., 2021)], focusing on existential soul-searching and on the meaning of one's plans.

Thus, SVSF constitutes a reflective process that engages the student in the development of new knowledge about the self;

its relationship to the self, to others, to time, to socio-emotional judgments (Sylvestre, 2013). This knowledge can guide current or future vocational choices (Boutin and Lamarre, 2008). The student distances himself from certain beliefs, for example that of being driven by determinism, and opens up to new choices, projects that take into account his way of being, his life history and values, and his limits (Allouche, 2012).

Our quantitative study made it possible to measure the presence of the effects of SVSF guidance on two dimensions: the dimension of the meaning of life and the dimension of the meaning of education.

Participants

Two cohorts of students of all ages who are questioning the meaning of their education but who do not have a severe pathology (proven depression, addictions, etc.) made up this research between 2018 and 2020. More specifically, for this research, we have chosen to include in our cohorts students in initial and continuing education, these two college audiences who, during their educations, are sometimes mixed together and sometimes benefit from distinct classes.

The first cohort (IPA approach) consisted of five students who perceived their education as a foundational experience, their number corresponding to the recommendations of Smith and Osborn (2004) and Clarke (2010). These students, all of whom were female, were enrolled in a Master's degree in humanities ($N = 4$) and a doctorate in automotive engineering ($N = 1$).

The second cohort (SVSF device) was composed of 43 students questioning the meaning of education, constituting the experimental sample ($N = 32$) and the control sample ($N = 11$). All the participants had similar socio-demographic characteristics. Thus, in terms of gender distribution, the majority of participants were women (69% for the experimental group and 73% for the control group). On the other hand, the average ages of the experimental group ($M = 44$ years, $ET = 8.71$) and the control group ($M = 36$ years, $ET = 10.27$) were significantly different, and the same was true for the education levels; 45% of the participants in the experimental group had a majority of students with 2–3 years of higher education, while 73% of the students in the control group had a majority of students with 4 years of higher education.

Procedure

For the first cohort, in order to lead the participant to an IPA understanding of their life experiences, three interviews were scheduled: during their education (T1), 3 months after the end of their education (T2), and 6 months after the education (T3). These three phases were preceded by a preliminary interview to discuss ethical considerations and to obtain free and informed consent.

Designed as a “question pool” used in a flexible and non-exhaustive way, an IPA interview guide structured the three phases, addressing the idiosyncrasy of lived experiences, the influence of the environment (Bernaud, 2018), the components of meaning as a process - directional meaning and meaningful meaning (Bernaud et al., 2020), and life

satisfaction (Diener and Tay, 2016). A participant zero helped validate the understanding and consistency of the guide.

For the second cohort, all participants, including those in the control group (Gaudron et al., 2001), individually completed an anonymous self-evaluation questionnaire on the meaning of life and the meaning of education in the pre-test phase 1 week before the beginning of the guidance and in the post-test phase 1 month after exiting the guidance in order to measure the effects. In addition, the participants in the control group received guidance on career choice, but not on the meaning.

Data Collection

For our first research phase (IPA), a rigorous transcription of the body of interviews was a preliminary step. During the interviews, we also wrote down the emotional expressions. It should be noted that the first transcript was made based on a randomly selected recording (Smith et al., 2009).

The next step consisted of listening to and conscientiously reading the participant's three interviews in order to identify key words and produce the beginnings of an analysis and understanding. After identifying the theme changes, the body of work was broken down. The items were arranged in a table with three entries: emerging themes, initial transcripts and exploratory comments (descriptive, linguistic, and conceptual). Grouping by themes of meaning present in at least 50% of the sample resulted in the addition of a fourth entry called "clustering." The procedure was then applied to each of our participants.

For our second research phase (SVSF), two dimensions of meaning were measured by questionnaire: (1) the meaning of life and (2) the meaning of education. The meaning of life dimension consists of the following scales: SWLS (Diener et al., 1985), fulfillment "Flourishing scale" (Diener et al., 2010), MLQ (Steger et al., 2006), and Meaning as a process (Bernaud et al., 2015). The Meaning of Education scale is a variant of the Meaning of Work scale (Bernaud et al., 2015). All items were measured using a seven-point Likert scale, where 1 means "strongly disagree" and 7 means "strongly agree."

The internal consistency of the scales ranged in the pre-test phase between $\alpha = 0.74$ and $\alpha = 0.89$ and in the post-test phase between $\alpha = 0.68$ and $\alpha = 0.85$. Only the consistency of the Flourishing scale shows a reliability level in the post-test phase that is slightly lower than $\alpha = 0.70$ (Table 1).

RESULTS

Analysis of the Participants' Speech Using the Interpretive Phenomenological Analysis Approach

We will focus here on the elements emerging from the IPA analysis that are most likely to show the links between the meaning of education and psychological wellbeing.

Four main aspects of the meaning of education emerged from the participants' accounts of their life experiences: (1) An "intrinsic sense of education" dimension, where the learner connects to their needs related to the sensory and perceptual

aspects; (2) An "existential meaning of education" dimension, where the learner's life path and the university's timeframe are discussed through the prism of the experience of being; (3) An "extrinsic meaning of education" dimension, where the learner develops their relationship with the world and connects them to others; (4) Finally, a "technical meaning of education" dimension, where the learner safely adapts to the environments in which they evolve (Table 2).

The "intrinsic meaning of education," "existential meaning of education" and "extrinsic meaning of education" dimensions and some of their sub-dimensions reveal the unique place of psychological wellbeing in the student's life. We will illustrate this with verbatims.

The "intrinsic meaning of education" refers to values deeply embedded in and for the self. These values are essential to the individual, independently of their objective utility.

"Why these studies? because I like to get involved in projects like this that interest me, that I am passionate about."

Intrinsic meaning is part of the pleasure-displeasure axis. This dimension encompasses several sub-dimensions, among which we will highlight the joyful learning. Joyful learning is the happiness generated by knowledge in the student, his or her delight in the learning situation or in the idea of learning itself (Nietzsche).

"I like to learn, I like to study, I'm always up for discovering new things in this training."

"I have a personality that likes to think in the abstract. I have always had a desire to learn, which is why I enrolled in this education."

The "existential meaning of education" dimension establishes a link between the act of existing and life satisfaction. The phenomenological approach led each student not only to explore whether their life was satisfying, but to determine through their own history what it meant to have a satisfying life. Throughout their interview, the students detach themselves from a jerky, exhaustive chronological account, which seemed to make up their identity, in order to reach a more elaborated view, allowing them to evaluate with more hindsight the extent to which their life seems satisfying and in relation to what.

The "existential meaning of education" dimension encourages a realization of the authentic self in education, with the student building a new bridge between their existing self and their relationship to the world, allowing them to develop a sense of wellbeing.

"I think I got into this training unconsciously, and what kept me going is that it makes me exist."

This dimension encompasses several sub-dimensions, among which we will highlight here the therapeutic meaning which concerns subjects who have gone through traumatic life situations leading to social exclusion or emotional difficulties (Gergen, 2015). The therapeutic meaning encompasses themes such as: flourishing (Guimard et al., 2015), distress, recognition, self-confidence, self-esteem, and identity.

TABLE 1 | Pre- and post-test SVSF measurement instrument (N = 43).

Dimensions	Scales	Subscales	Pre-test's α	Post-test's α	
(1) Meaning of life	SWLS		0.84	0.76	
	Flourishing scale		0.76	0.68	
	MLQ		Search for meaning	0.81	0.84
			Presence of meaning	0.82	0.77
		Inetop meaning scale	Direction	0.89	0.85
			Meaning	0.76	0.75
(2) Meaning of education		Sensation	0.75	0.74	
	Education direction	Education direction	0.74	0.70	
	Education meaning	Education meaning	0.80	0.70	
	Psychological wellbeing	Psychological wellbeing	0.80	0.78	
	Joyful learning	Joyful learning	0.78	0.70	

TABLE 2 | Extract of the various emerging themes and grouping by clusters.

Phase 1: Clustering of emerging themes	Phase 2: Thematic clustering
	I- Existential meaning
Meaning of time	
Meaning of experience	
Recollection	
Event experienced as painful Event experienced as traumatic	
Relationship to timeframe	
Feeling of wasting time	
Feeling of never having taken the time to know oneself Feeling of not having enough time	
Desire to take time for oneself	
	Satisfaction with life
Search for satisfaction with life	
Quest for existential success Desire for satisfaction with life	
Self-injunction to satisfaction with life	
	II- Meaning of education
	Search for meaning
Reflexivity	
Reflexivity on education and training	
Reflexivity on the goal to be reached through education	
	Presence of meaning
Level of presence of meaning	

"I need to take this course to have more confidence in myself et al.so in relation to the way others and society look at me."

"I wanted to study.to be somebody. To be someone is to know things, to be respected, not to be a loser."

"Thanks to the training I have reconstructed myself, I have discovered myself with strengths that I never imagined. I think that this training course is somewhere to repair what was left behind, what was neglected 12 years ago."

The "extrinsic meaning of education" dimension also includes various sub-dimensions, among which we will point out the eudemonic meaning, or the search for achieving prescribed goals that contribute to the wellbeing of the family and the community

(Seligman, 2002). Here the student aspires to build their academic and professional life orientation from the perspective of maintaining the wellbeing of their family unit. In general, the IPA reveals that family demands may have been destabilizing, even distressing, for these students, who have given up, at least temporarily, on affirming themselves as existing beings, in order to give themselves to those around them. This is their priority, which will perhaps later be reversed in favor of a subsequent consideration of the self, of one's own psychological wellbeing.

"With this training I want to do better than my parents did for them. To say that they sacrificed for something. I feel indebted to my parents."

"This training proposed by my mother has allowed me to see many things and to have another way of thinking, to be well."

Analysis of SVSF Device Effects by Hedge's g

Applying Hedge's g , appropriate for our sample sizes (Watson et al., 2016), reveals an overall average effect of $g = + 0.69$ for the experimental sample ($N = 29$) (Table 3). Thus, all of Hedge's g indicators, measuring the strength of a change for SVSF participants, confirm the presence of effects. SVSF affects meaning of life ($g = + 0.69$), meaning of education ($g = + 0.73$), life satisfaction ($g = + 0.78$), sense of fulfillment ($g = + 0.71$), search for meaning ($g = + 0.86$), presence of meaning ($g = + 0.81$), direction in life ($g = + 0.72$), the meaning given to their education ($g = + 1.05$), the direction given to their education ($g = + 0.72$), and the feeling of psychological wellbeing in education ($g = + 0.66$). Questioning the relationship between the meaning given to one's life and one's education is therefore relevant. They also confirm that questioning meaning leads the individual to overcome obstacles encountered in his or her personal life and/or education.

Concerning the control group ($N = 11$), the results obtained indicate a global average effect of $g = + 0.36$, which results in a small size effect (Table 4). More specifically, the overall results of the control group show a significantly lower level of meaning of life and a significantly lower level of meaning of education than the experimental group. Thus, the SVSF guidance would have contributed to an important and significant improvement

TABLE 3 | Measurement of Hedge *g* effects on the experimental group.

Experimental group	Scales	Subscale	Hedge <i>g</i>	Interpretation of effect
(1) Meaning of life	SWLS		0.78	Medium
	Flourishing scale		0.71	Medium
	MLQ	Search for meaning	0.86	Large
		Presence of meaning	0.81	Large
	Inetop meaning scale	Direction	0.72	Medium
		Meaning	0.38	Small
		Sensation	0.44	Small
(2) Meaning of education	Education direction		0.72	Medium
	Education meaning		1.05	Large
	Psychological wellbeing		0.66	Medium
	Joyful learning		0.47	Small

Experimental sample ($N = 29$); *g* average = + 0.69; 0.01 = very small; 0.20 = small; 0.5 = medium; 0.8 = large; 1.20 = very large; and 2.00 = huge.

TABLE 4 | Measurement of Hedge *g* effects on the control group.

Experimental group	Scales	Subscales	Hedge <i>g</i>	Interpretation of effect
(1) Meaning of life	SWLS		0.31	Small
	Flourishing scale		0.40	Small
	MLQ	Search for meaning	0.24	Small
		Presence of meaning	0.65	Medium
	Inetop meaning scale	Direction	0.26	Small
		Meaning	0.04	Very small
		Sensation	0.29	Small
(2) Meaning of education	Education direction		0.24	Small
	Education meaning		0.06	Very small
	Psychological wellbeing		0.52	Medium
	Joyful learning		0.95	Large

Experimental sample ($N = 11$); *g* average = + 0.36; 0.01 = very small; 0.20 = small; 0.5 = medium; 0.8 = large; 1.20 = very large; and 2.00 = huge.

in the meaning attributed by the participants to their life and their education. Similarly, the overall results of the control group show a significantly lower level of wellbeing and life satisfaction than the experimental group. SVSF would therefore also have contributed to a significant improvement in the participants' sense of wellbeing and life satisfaction.

DISCUSSION

Our literature review has shown that students can be faced with stress leading to a feeling of malaise and a risk of losing meaning during their university education. The societal context in which they evolve changes their relationship to learning and increases the risk of the appearance of pathogenic phenomena such as workaholism, hikikomori, and burnout.

A student's wellbeing is not a luxury; it validates the meaning attributed to their plans, it reveals their psychological health, and is a predictor of their commitment. How can we foster or consolidate this wellbeing? Through reflective work on the meaning that the student attributes to their education.

Implementing an educational plan is not simply a matter of receiving education; it is often the expression of a desire to belong to the world, the expression of an existential desire.

Life history and education are intimately linked. Education appears as the realization of a work subject to unconscious inner movements and to a desire to be part of the world. Reflective work on their major life experiences allows the student to become aware of why they agreed to studying and the meaning they attribute to it. The mechanisms of choice are made manifest and potentially transformed. This promotes the stability of their educational commitment.

At the end of this research, we can consider our hypothesis H1 as valid: "Seeking the meaning of an education through a reflective guidance would increase the student's sense of psychological wellbeing by promoting more authentic choices." The quantitative data from SVSF confirms this, showing significantly strong effects for the Life Satisfaction, Flourishing and Psychological wellbeing.

Moreover, we can consider our hypothesis H2 as valid: "A reflective approach to one's life experiences would enable the student to clarify their choices and attribute a high level of meaning to their education." Our two research periods were able to confirm this, through the IPA verbatims and the SVSF quantitative data. By giving meaning to their education, objectified by distancing themselves from their emotions and beliefs, the IPA offers students the freedom to choose. As for SVSF, it shows significantly strong effects

for Meaning of Life and for Meaning of Training, including Education direction.

Both IPA and SVSF engage the individual in a reflexive process, a process of co-evaluation of his perception of his major life experiences (Jorro, 2005) with the aim of encouraging awareness of his essence (Husserl, 2004). During these two periods, the students were led to shed light on certain shadowy areas of their experience. They were in the position of co-researchers, people who are beings in the world (Heidegger, 1986) and who, through a reflexive posture, are able to understand their own perceptions of meaning and meaninglessness in their lives and learning experience (Merleau-Ponty, 1945).

By “capturing” the major life experiences that the student has struggled to interpret unsuccessfully on their own, agreeing to reflective work (IPA or SVSF) offers them a better education-life balance and greater emotional stability. Indeed, in this transformative process, the sources of the student’s malaise.

are discovered, and the attribution of new meanings, leading to new choices and liberating behaviors, resulting in a lightening of the mental load.

IPA, an approach to the study of complex psychological phenomena, has also proven to be a remarkable support to meaning. However, because it is rooted in a community of peers, the reflective work agreed upon in SVSF enables the individual to progress with a certain delicacy from a progressively conscious self to a secure and gratifying person in the world.

Practical Implications

Our research is not part of a therapeutic or prescriptive approach. It aims to lead the student to adopt an active stance, resulting in a descriptive, analytical and interpretative mental process of their lived experiences. University guidance is traditionally based on the use of psychometric assessments (e.g., interest questionnaires). The counselor then positions himself as a mediator between the tool and the student, without questioning the meaning for the student of his education. This limits the strength of a vocational choice. This is why we wish to demonstrate the potential of a guidance system to clarify the meaning of education.

Indeed, it is important in our opinion to enrich the reflection of the universities and counseling and guidance services for students. The university should support the students in the development of this meaning through concern for their psychological needs, considering also that their success depends largely on it. The challenge of providing support for meaning is to prevent any risk of loss of meaning and a feeling of malaise that can lead to a feeling of existential emptiness. Understanding one’s relationship to the world, to others, to oneself, to one’s education,

inevitably leads the student to live a more authentic relationship with the latter and to develop a feeling of wellbeing.

Limitations and Futures Perspectives

It would be interesting to be able to study the potential differences in perception between learners by academic year. A breakdown by age group would also be feasible. However, such an approach would require a significant increase in our two cohorts (IPA and SVSF).

Using larger samples would also allow a comparison of the effects of a reflective approach on initial and continuing education students.

Another limitation is that this same research was conducted over one academic year. It would be interesting to develop a new timeframe by conducting the IPA interviews and the SVSF support system over a full academic cycle to test for effects and stability over a longer period (Forgues and Vandangeon-Derumez, 1999).

Finally, before starting this research, we did not specifically intend to use the IPA approach as a support device, but its potential in this respect could lead us to think of a detailed structuring between these two modes of developing reflexivity.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors conducted the literature search, analyzed and processed the data, and wrote and reviewed the manuscript.

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What Makes Indian Management Students Thrive? Role of Decision-Making Discretion, Broad Information Sharing, and Climate of Trust

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Thriving is a psychological state in which individuals experience a sense of vitality and a sense of learning. Thriving come from relational connections with others, and is deeply rooted in social systems. Theoretical literature suggests that thriving occurs in the presence of decision-making discretion, broad information sharing, and a climate of trust. However, no study has investigated these environmental factors empirically. Using a multiple-studies approach, we (a) established valid and reliable scale for each of these environmental factors using experimental vignettes, (b) confirmed the association of decision-making discretion, broad information sharing and climate of trust with thriving, and (c) identified the role of self-determination theory in determining these relationships. Our analysis was based on data collected from 512 Indian management students across five studies. The results indicate significant difference in thriving for high vs. low level for decision-making discretion, broad information sharing and climate of trust. The relationship of these environmental factors with thriving is mainly due to the fulfillment of the need for competence. Competence partially mediates the relationship of decision-making discretion with thriving, and fully mediates the relationship of broad information sharing and climate of trust with thriving. Autonomy, although positively related with the environmental factors, does not lead to thriving. Practical implications, limitations and research avenues are discussed.

Keywords: thriving, self-determination theory, autonomy, competence, decision-making discretion, broad information sharing, climate of trust

INTRODUCTION

Happiness of employees is an aspiration for an organization that believes in its contribution to organizational performance. Happy employees can positively contribute to performance in many ways. Happiness leads to altruistic behavior, good health due to higher immunity, and effective management of stress (Lyubomirsky et al., 2005; De Neve et al., 2013; Layous and Lyubomirsky, 2014). These positive outcomes reduce absenteeism, promote bonhomie at the workplace and increase engagement. Consequently, organization benefits from higher productivity, collaboration, organizational citizenship behavior and performance. Thriving is one of the aspects of happiness that may be experienced by employees. It is a psychological state in which individuals feel that

they are growing, developing, and are energized (Porath et al., 2012). Thriving is associated with a multitude of positive organizational outcomes such as occupational performance, low burnout or stress, job satisfaction, and organizational commitment (Spreitzer and Porath, 2012, 2014; Spreitzer et al., 2012; Parker et al., 2013; Gerbasi et al., 2015; Kleine et al., 2019).

Spreitzer et al. (2005) has used self-determination theory to conceptually identify the measures organizations can take to enable an environment for thriving for employees. Self-determination theory suggests that individuals would perform well professionally and achieve personal well-being in environments that help satisfy their three fundamental psychological needs: need of autonomy, competence and relatedness. Arguing through this theory, Spreitzer et al. (2005) has postulated that decision-making discretion, broad information sharing and climate of trust are the aspects of organizational environment that can provide psychological satisfaction leading to thriving in employees. However, there is no existing research that has empirically tested the relationship of these environmental factors with thriving. In this paper, we examine (a) the relationship of decision-making discretion, broad information sharing and climate of trust with thriving, and (b) the role of self-determination theory in determining this relationship.

The paper provides the conceptual background of thriving and self-determination theory, and the arguments concerning the hypothesized relationships. It presents a multiple studies approach using a combination of experimental and field study methods. The first study is experimental. It develops and tests scales for decision-making discretion, broad information sharing and climate of trust. For this purpose, new items for these three constructs are defined based on theoretical literature, and tested for convergent and discriminant validity and reliability. Experimental vignettes are also defined for high and low situations for the environmental factors, and are verified through *t*-tests on the developed scales. The second study series is experimental. It investigates the relationship of decision-making discretion, broad information sharing and climate of trust with thriving. For this purpose, the experimental vignettes and scales developed in Study 1 are used along with thriving scale, and the significance of the differential impact of low and high levels of these environmental factors on thriving, is verified using *t*-tests. The third study is a field study. It explores the direct relationship of these factors with thriving, and the mediating role of constructs of self-determination theory (autonomy, competence and relatedness). All the hypotheses are tested in this study using hierarchical regression analysis. Based on the findings of this study, we discuss the theoretical contribution, practical implication and research directions.

Thriving

Thriving is a psychological state where individuals experience progress and heightened momentum at their workplace (Carmeli and Spreitzer, 2009, p. 169). It is also associated with an enhancement in short-term functioning of individuals and their long-term adaptability at work (Spreitzer et al., 2005).

Thriving is perceived as a psychological state rather than a trait. Therefore, changes in thriving are seen to be extremely fluid and situationally dependent on the individuals' environment. This makes it a challenging equilibrium to maintain. Thriving is indicated by a blend of two key factors: vitality and learning.

Vitality is the positive feeling of having energy and feeling alive at work (Nix et al., 1999). It can also be described as the energy available to an individual, either directly or indirectly from fulfilling fundamental psychological needs (Ryan and Deci, 2000). Vitality encompasses the emotive dimension of thriving. Learning is defined in terms of acquiring and applying relevant knowledge and skills at work to build proficiency (Edmondson, 1999). It has been known to have positive effects on performance (Colquitt et al., 2000). Learning signifies the cognitive dimension of thriving.

Self-Determination Theory

Self-determination theory (SDT) (Ryan and Deci, 2000) posits that individuals are motivated and exhibit well-being, in organizational structures to the extent that they experience psychological satisfaction within those structures. The theory explains the structures that are supportive or detrimental toward these tendencies.

The theory also propounds that humans are inherently aligned toward actualizing their capabilities, through processes such as intrinsic motivation, social internalization and integration, and connecting with others (Vansteenkiste and Ryan, 2013). Intrinsic motivation is defined as an inherent inclination toward assimilation and exploration that helps individuals in their cognitive and social development. It yields greater vitality and improved conceptual learning (Deci and Ryan, 2008). Individuals, who are able to fully integrate and internalize social norms and guidelines, enact them with more effectiveness (Ryan and Connell, 1989).

Self-determination theory considers psychological needs to be innate and fundamental requisites, similar to biological needs (Ryan and Deci, 2000). The term "needs" has been used most commonly to refer to a person's conscious wants, desires, or motives (Baard et al., 2004). Consequently, psychological need satisfaction is derived from a need to meet psychological deficit. It is regarded as the primary nutriment for individuals' optimal functioning, psychological growth and well-being (Ryan and Deci, 2000).

The theory incorporates three dimensions corresponding to three fundamental needs that are prerequisites to psychological well-being: need for autonomy, need for competence and need for relatedness. According to Spreitzer and Porath (2012), these three dimensions explain variance in thriving, and predict affective and cognitive dimensions of thriving.

Need for Autonomy

Autonomy represents individuals' innate inclination to experience volition and a sense of choice and freedom when carrying out an activity (Ryan and Deci, 2000). It requires the feeling that one is the initiator of one's actions (Deci, 1975). Notably, both individualistic and collectivistic modes of functioning can happen volitionally.

When an individual's behavior is autonomous in nature, it is minimally self-depleting, and creates less conflict. It also helps her/him perform well in activities requiring self-control (Muraven et al., 2008). Studies have shown that performance-contingent rewards administered in an autonomy-supportive interpersonal climate, as opposed to a controlling interpersonal climate, result in higher intrinsic motivation (Ryan et al., 1983). Autonomous forms of motivation maximize heuristic performance and commitment.

Need for Competence

The need for competence is interpreted as an individual's inherent desire to feel effective in the interactions with her/his surroundings (Ryan and Deci, 2000). Internalization of extrinsically motivated activities is also a function of perceived competence. Individuals adopt activities that relevant social groups value when they feel efficacious with respect to those activities.

Competence allows individuals to feel valued, and encourages them to take risks to accomplish the tasks at hand. It further motivates them to experiment with new and more efficient methods to solve mundane problems. Competence is prominently displayed in individuals' propensity to explore and manipulate the environment, and to engage in tasks that test and extend their skills. It promotes success at challenging tasks, and in attaining desired outcomes.

Need for Relatedness

The need for relatedness is defined as an individual's inherent propensity to feel connected to others, feel loved and cared for Baumeister and Leary (1995). Relatedness calls for a sense of mutual respect, caring and reliance amongst individuals.

The need for relatedness is satisfied when individuals sense a feeling of communion, and develop intimate and lasting relationships with others (Ryan and Deci, 2000). Relatedness furthers their need for growth as they adapt and evolve by learning from experience of their counterparts (Ryan and Grolnick, 1986). It enhances intrinsic motivation, and strengthens feelings of trust between individuals. Taking decisions as a community not only affects a larger system, but also encourages them to relate to each other. Further, it facilitates internalization of required behaviors (Ryan et al., 1994). Individuals tend to imbibe values, perspectives and behavior that are considered socially acceptable.

Enablers of Thriving

Self-determination theory explains the psychological basis of individual behavior, to pursue conditions that promote growth and progress (Ryan and Deci, 2000). Using this theoretical lens, Spreitzer et al. (2005) have provided a conceptual understanding of the influence of environmental conditions on thriving. They have identified three environmental factors that may influence thriving, namely (a) decision-making discretion, (b) broad information sharing and (c) climate of trust. We hereby elaborate on the environmental factors, and argue the role of the different dimensions of SDT in determining the impact of these factors on thriving.

Decision-Making Discretion

Decision-making discretion (DMD) refers to an organizational environment in which individuals have authority to exercise choice on what tasks to execute and how to execute them (Ryan and Deci, 2000). It provides them an opportunity to drive their own decisions, and feel more in control of their work without any external regulation.

Decision-making discretion can allow individuals to have influence over strategic, administrative and operating outcomes at the workplace (Ryan and Deci, 2000). People in this environment are more likely to proactively and persistently apply their skills to their tasks (Bandura, 1988). Moreover, DMD can assist individuals in forging new skill-sets, making them more comfortable in taking risks, and exploring new found opportunities (Spreitzer, 1995). It can also make them more focused about seeking out new directions for performing their tasks (Amabile, 1993), and accomplishing their job in the most efficient manner possible.

Studies have found that offering choice and encouraging self-initiation in managers, build their occupational satisfaction. Further, choice enhances intrinsic motivation and, facilitates internalization of requisite behaviors (Zuckerman et al., 1978). Besides, upskilling supervisors, so that they can maximize opportunities for their managers to take initiative, improves the managers' attitudes toward their task (Deci et al., 1989).

Therefore, it is expected that DMD would develop the capability and energy in individuals to demonstrate work behaviors that enable them to perform well in their organization. We propose,

H1: Decision-making discretion is positively related to thriving.

Role of Autonomy

Exposure to work environments that allow discretion to make decisions, defines the degree to which individuals feel that their actions are driven by themselves rather than by external factors. This drives their sense of autonomy. DMD may manifest in terms of taking individual perspectives into account, promoting greater choice, and encouraging self-initiation (Gagné and Deci, 2005). All these factors satisfy the need for autonomy. When individuals are externally regulated, their need for autonomy is not met (Ryan and Deci, 2000). For example, employees who are forced to meet specific deadlines experience little volition in executing the assigned tasks.

Liberty in decision-making provides individuals the opportunity to accomplish their tasks the way they desire. Autonomy felt due to availability of choice, and opportunities for self-direction, enhance their intrinsic motivation (Deci and Ryan, 2008). This can consequently lead to thriving. Therefore, we propose:

H1a: Autonomy fully mediates the relationship between decision-making discretion and thriving.

Role of Competence

Individuals have an inherent need for competence. Satisfaction of this need is one of the primary forces of their motivation (Mouratidis et al., 2008). Individuals consciously undertake

activities that allow them experience, and enhance their competence. When they have the freedom to make their own decisions, they assume tasks that help them harness their skills more efficiently. This increases their competence, as well as confidence in it. Studies have found that support from superiors for self-driven decisions leads to greater satisfaction of competence (Baard et al., 2004).

Challenging activities that allow individuals to showcase competence characteristics are intrinsically motivating (Danner and Lonky, 1981). Intrinsic motivation can help individuals thrive in the organization. Therefore, DMD can bring about thriving by making individuals more competent. We propose:

H1b: Competence fully mediates the relationship between decision-making discretion and thriving.

Role of Relatedness

Being part of organizational decision-making motivates individuals to relate heedfully by promoting a sense of connectedness with others (Ryan and Deci, 2000). When they have the freedom to decide what actions to take and how to execute them, individuals are also more likely to have more opportunities and openness for reaching out to their peers. They are also more likely to create positive feedback loops that help them learn new techniques.

Thus, environments characterized by a sense of secure relatedness can enable individuals to thrive (La Guardia et al., 2000). Ryan and Grolnick (1986) have shown that students, whose teachers are warm and caring, experience greater intrinsic motivation. According to research by Wall et al. (1986), structuring workflows to allow interdependence among employees and identification with workgroups, and showing concern and respect for each employee, had a positive effect on work outcomes. There is also evidence that effective workgroups can facilitate internalization of extrinsic motivation and augment thriving. James and Greenberg (1989) found that identifying with a group, which facilitates internalization of group values, led to enhanced performance. Thus, we propose:

H1c: Relatedness fully mediates the relationship between decision-making discretion and thriving.

Broad Information Sharing

Broad information sharing (BIS) refers to an organizational environment in which information is communicated widely throughout the organization (Spreitzer, 1995). Sharing information is central to “open book management,” a management methodology that advocates transparency of the organization in all its activities. Organizational leaders may provide information to their followers on aspects like opportunities to develop new skills, and feedback on their task effectiveness (Walumbwa et al., 2010). Other types of information can be organization’s vision or performance and product/service quality feedback.

Literature has discussed the benefits of certain aspects of BIS environment in an organization. Information sharing in the form of feedback resolves feelings of uncertainty in individuals. It allows them to accurately appraise themselves and evaluate

their progress. It also enables them to maximize the use of their time toward personal growth and improvement (Ashford and Cummings, 1983). Feedback helps aim work-affiliated activities toward desired personal and organizational goals (Locke and Latham, 1990). Regular and adequate feedback also creates an optimal learning environment for an individual, and increases affective outcomes (Vroom, 1964). Positive feedback enhances intrinsic motivation, and facilitates internalization of requisite behaviors (Deci, 1975). It also improves individuals’ attitudes toward their task (Deci et al., 1989).

Therefore, BIS helps individuals understand the meaning and purpose of their work better, and assists them in conceptualizing how they can contribute in an appropriate manner. This can enable them to thrive and perform their job effectively. Thus, we propose:

H2: Broad information sharing is positively related to thriving.

Role of Autonomy

Broad information sharing gives individuals access to general organizational knowledge and specific information about their current performance, personal progress on goals and objectives, and relative importance of various goals to personal progress (Ashford and Cummings, 1983). With broad information access, individuals have the ability to expand their understanding of how the organizational structure functions, which can promote their feeling of autonomy (Weick and Sutcliffe, 2001).

Autonomy experienced due to BIS can equip individuals with the energy and learning opportunities, to perform assigned work well, and produce positive work outcomes. This is because they can tend to their tasks without facing hurdles and delays. Deci et al. (1989) found that providing pertinent information to individuals in a non-controlling manner was associated with higher occupational satisfaction. This is likely to lead to thriving. Thus, we propose:

H2a: Autonomy mediates the relationship between broad information sharing and thriving.

Role of Competence

A BIS environment increases the ability to swiftly decipher problems as they come to light, and coordinate actions to solve the problems. The increased capacity to respond effectively in unfamiliar situations acts as a stimulus for exploring, experimenting and learning new behaviors (Bunderson and Sutcliffe, 2002). Studies have found that information sharing, in the form of positive feedback, satisfies individuals’ inborn need for competence (Mouratidis et al., 2008). Environments that provide adequate feedback are regarded as a central factor for competence fulfillment (Deci and Ryan, 2008).

According to existing literature, an extraneous event that increases an individual’s feeling of competence (for example, positive feedback), also enhances her/his intrinsic motivation (Arnold, 1976). The individual feels more responsible for successful performance. This would lead to thriving. Thus, we propose:

H2b: Competence mediates the relationship between broad information sharing and thriving.

Role of Relatedness

Broad information sharing creates an exploratory environment where individuals are ready to reach out to each other for exchange of information. As they interact with others, they gain a deeper understanding about the intricacies of their work. As individuals comprehend how to recombine their existing knowledge in new ways to solve problems, they also realize the fitment of their work into the larger scheme of things. They are able to respond to suboptimal solutions, and increase their understanding of the working of the organization (Weick and Sutcliffe, 2001).

Existing studies have found that individuals in high-quality interpersonal relationships exchange more information and ideas, value one another, and provide a climate in which one feels safe to perform (Edmondson et al., 2004). Getting insight into the big picture enables individuals to shift focus to larger organizational contributions instead of focusing only on narrow tasks, thus enabling them to thrive. Therefore, we propose:

H2c: Relatedness mediates the relationship between broad information sharing and thriving.

Climate of Trust

Climate of trust (COT) refers to an organizational environment characterized by established and dominant behaviors that demonstrate inter-personal trust. The behaviors may involve acknowledging and considering perspectives of individuals while taking decisions, and including them in the decision-making process (Lawler, 1992). They may also include offering choice, and encouraging self-initiation (Deci et al., 1989), thus leading to higher job satisfaction and self-regulation.

Climate of trust creates situations favorable for creative engagement and thriving. When individuals have trust, they are more willing to take risks (Mayer et al., 1995; Edmondson, 1999). Also, COT facilitates experimentation with new behaviors, since individuals feel safe enough to explore (Spreitzer, 1995; Bunderson and Sutcliffe, 2002). Work environments and managerial methods, which create a climate of trust, promote basic need satisfaction, intrinsic motivation and appropriate internalization of extrinsic motivation. This in turn leads to persistence, positive work attitudes, organizational commitment, and psychological well-being. Therefore, climate of trust is critical to promote thriving in individuals. Thus, we propose:

H3: Climate of trust is positively related to thriving.

Role of Autonomy

Climate of trust encourages individuals to be open to voice their thoughts and conduct activities the way they want. Thus, it promotes freedom and autonomy to execute tasks. COT can allow autonomy to individuals in areas like goal setting, decision-making and task planning. It can create a sense of empowerment, leading to enhanced self-determination.

When individuals are situated in COT, they are likely to feel more constructive and confident of conquering challenges in their immediate surroundings (Spreitzer, 1995). Feeling of

autonomy created by COT can promote internalization and integration of extrinsic motivation, causing positive outcomes. Studied have found that self-determination resulting from a sense of empowerment leads to thriving (Champy, 1995). Thus, we propose:

H3a: Autonomy mediates the relationship between climate of trust and thriving.

Role of Competence

Climate of trust encourages individuals to invest their resources in an unconstrained manner, and completely commit their effort and time in executing the assigned tasks. They know that they would get help and positive feedback from others along the way to help them perform successfully. Positive feedback enables individuals to take risks while making them feel an integral member of the organization, thus promoting their competence (Deci, 1975). Also, COT creates a supportive environment that is central for competence fulfillment (Deci and Ryan, 2008).

Competence due to positive feedback comes with a sense of responsibility for individual performance, and an appreciation about its effect on organizational performance (Fisher, 1978). Competence resulting from COT thus promotes energy and a drive toward learning, with the objective of performing well as a part of the organization. We propose:

H3b: Competence mediates the relationship between climate of trust and thriving.

Role of Relatedness

When individuals are exposed to COT, it invokes a sense of belongingness and a belief that they are valued members of the organization. Consequently, this fosters a sense of relatedness, as they feel much more understanding with regard to each other (Rhoades and Eisenberger, 2002).

The sense of relatedness created by COT allows individuals to collaborate with each other, and work together toward attaining high levels of performance. It also sparks feelings of positive emotions, leading to increased vitality and openness to learning (Fredrickson, 2001). Thus, we propose:

H3c: Relatedness mediates the relationship between climate of trust and thriving.

To test these hypotheses, we performed a series of studies. This was required since some constructs (DMD, BIS and COT) did not have existing scales, and empirical analysis on them was possible only after we had defined and tested scales. The first study helped to develop and test scales for DMD, BIS and COT. The second study helped to verify the results obtained from the first study, and assess how thriving differed for low and high levels of DMD, BIS and COT (and thus how these environmental factors impacted thriving). The third study helped to verify their impact on thriving, and tests all the hypotheses. The three studies were conducted on different sets of participants to prevent consistency bias.

STUDY 1

The objective of Study 1 was to define and validate measures for decision-making discretion, broad information sharing and climate of trust, as they do not have pre-existing measures. To enable this process, we defined new scales and tested them through an experimental study on a sample of management students. For this purpose, we also created experimental vignettes. Experimental vignettes are small scenarios representing commonly faced real life situations (Vargas, 2008; Atzmüller and Steiner, 2010; Aguinis and Bradley, 2014). They are used in experimental studies, and are accompanied by a set of questions. Respondents are required to respond to the questions, based on their assessment of the given situation. Experimental vignette method helps to establish causal relationships. The content of the vignette is structured, and controls for factors that may confound the results (Aguinis and Bradley, 2014). It also helps to test item scales by enabling manipulation check. Besides, use of vignettes reduces scope for social desirability and acquiescence bias (Podsakoff et al., 2003).

We carried out the following steps to develop the item scales. First, we defined the items and vignettes based on the existing theoretical literature on decision-making discretion, broad information sharing and climate of trust (Spreitzer et al., 2005). For each variable, we defined two versions of the vignette: one representing a low level, and the other representing the high level. Second, we conducted an exploratory factor analysis on the items for all variables together, to confirm that the three variables were valid independent constructs. Third, we calculated the average variance extracted for each variable to confirm their convergent validity. Fourth, we compared it to the correlation between variables to confirm their discriminant validity. Fifth, we calculated the Cronbach's Alpha of each variable to confirm reliability. Sixth, we conducted *t*-tests to check for significance of difference between high and low levels of each vignette, to confirm content validity of the variables.

Method

Participants

Two hundred and forty students ($n = 108$ females; $n = 132$ males) from an Indian Institute of Management participated in the study. The mean age was 18.85 years and SD was 1.3. Participation in the study was voluntary and no compensation was provided to the students. Participants were assured that their responses would remain anonymous. After obtaining participants informed consent, the survey was administered with the help of two research assistants. The research assistants collected data over a period of time from students across campus. Average time taken to complete the survey was 10 min.

Procedure

Based on the description of DMD, BIS and COT in the context of thriving (Spreitzer et al., 2005), we defined items for each of these variables. We also defined two vignettes for each variable; one denoting a situation in which DMD, BIS or COT is high, and the other denoting a situation in which DMD, BIS or COT is low. A total of six vignettes were defined

(Supplementary Appendix A). Thus, we created eight scenarios representing a 2 (high vs. low DMD) \times 2 (high vs. low BIS) \times 2 (high vs. low COT) between-subjects research design. Each scenario contained three vignettes corresponding to either a high or a low level DMD, BIS and COT. Use of vignettes ensured that the responses were standardized and not influenced by acquiescence bias.

Thirty students were allocated to each one of the eight scenarios on a random basis. Tests revealed no statistical difference in the demographics of the students assigned to the eight scenarios. Every student responded to items on DMD, BIS and COT for each scenario.

Measures

Measures for DMD, BIS and COT were created with five items each. Based on the given situation, the participants responded to the items on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). Exploratory factor analysis (EFA) using promax rotation, and Cronbach's Alpha (α) was used to test validity and reliability of the measures.

All items of DMD are provided in **Table 1**. Items include "You have the autonomy to do the assignment the way you want," "You are free to select the real-life situation from any time era" and "You can choose how short you want to make the assignment."

All items of BIS are provided in **Table 1**. Items include "You know the different sections which will constitute the assignment," "You are aware about the layout, font and line spacing to be used for the assignment" and "You have been told about the structure and flow of the assignment."

All items of COT are provided in **Table 1**. Items include "The faculty makes it comfortable to seek clarifications," "The faculty provides a secure environment for exchanging ideas and doubts" and "You can rely on the faculty for giving honest feedback."

Results and Discussion

Exploratory factor analysis for items of all the variables together resulted in extraction of three factors with insignificant cross-loading of items across factors. Items for one variable loaded on one factor, and all factor loadings were more than 0.60. The average variance extracted (AVE) for each variable was more than 0.5, denoting convergent validity. Besides, the square root of AVE was greater than the correlation between the variables, denoting discriminant validity (Fornell and Larcker, 1981).

The reliability for DMD ($\alpha = 0.71$), BIS ($\alpha = 0.78$) and COT ($\alpha = 0.87$) was acceptable. The mean statistic for DMD, BIS and COT was used to conduct *T*-tests for manipulation check of the vignettes. The results revealed that there was significant difference between the vignettes representing high and low DMD [$t(238) = 5.74, p < 0.001, d = 0.74$], high and low BIS [$t(238) = 7.48, p < 0.001, d = 1.06$], and high and low COT [$t(238) = 7.14, p < 0.001, d = 0.92$].

The results of Study 1 denoted that DMD, BIS and COT were three distinct and independent variables. The new scales developed for DMD, BIS and COT had convergent and discriminant validity, and reliability. Therefore, these scales could be considered for collecting data in other studies. Also, the vignettes, designed for high and low levels of DMD, BIS and

TABLE 1 | Item scales for study 1 and study 2A, 2B and 2C.

Preliminary studies		Study 1	Study 2A, 2B, 2C
S. No	Item scales	Factor loading	Factor loading
A	Decision-making Discretion (Study 1: $\alpha = 0.71$; Study 2: $\alpha = 0.75$)		
1	You have the autonomy to do the assignment the way you want to	0.76	0.86
2	You feel the freedom about how you want to do the assignment	0.74	0.84
3	You are free to select the real-life situation from any time era	0.61	0.70
4	You feel in control about what you want to do in the assignment	0.65	0.65
5	You can choose how short you want to make the assignment	0.61	0.62
B	Broad Information Sharing (Study 1: $\alpha = 0.78$; Study 2: $\alpha = 0.84$)		
1	You know the different sections which will constitute the assignment	0.86	0.68
2	You are aware about the layout, font and line spacing to be used for the assignment	0.84	0.66
3	You have been told about the structure and flow of the assignment	0.79	0.65
4	You knew how you would go about collecting information about your assignment	0.69	0.63
5	You have information about the format of the assignment	0.63	0.63
C	Climate of Trust (Study 1: $\alpha = 0.87$; Study 2: $\alpha = 0.91$)		
1	The faculty makes it comfortable to seek clarifications	0.87	0.94
2	The faculty provides a secure environment for exchanging ideas and doubts	0.82	0.85
3	You can rely on the faculty for giving honest feedback	0.81	0.78
4	The faculty values your opinion and perspectives	0.80	0.72
5	The faculty makes it possible to improve assignment quality through open discussion	0.74	0.75
D	Thriving (Study 1: Not Applicable; Study 2: $\alpha = 0.78$)		
1	While doing this assignment, you would often get new insights about the course		0.81
2	You would continue to learn more, as you spend more time on this assignment		0.80
3	You would see yourself getting continuously better at the selected concepts		0.78
4	Doing this assignment will not make you learn anything (R)		0.77
5	While doing this assignment, you would develop a lot as a learner of the course		0.75
6	You would feel alive and vital while doing this assignment		0.65
7	The assignment would give you energy and spirit		0.64
8	You would not feel very energetic about doing the assignment (R)		0.64
9	Doing this assignment will make you feel alert and awake		0.60
10	While doing this assignment, you would look forward to each day you work on the assignment		0.64

α , Cronbach's alpha; Study 1: $N = 240$; Study 2: $N_{2A} = 60$; $N_{2B} = 60$; $N_{2C} = 60$.

COT, were statistically valid. The high and low levels of each variable were significantly different from each other. Therefore, we could use these vignettes in other studies for further analysis of the variables.

STUDIES 2A, 2B AND 2C

We followed Study 1 with three experimental studies to examine the relationship of DMD and thriving, BIS and thriving, and COT and thriving. For this purpose, we used the item scales and the vignettes created in Study 1, and collected data from another sample of management students (different from Study 1).

The objective of the studies was to test whether thriving differed for high vs. low level of DMD (Study 2A), high vs. low level of BIS (Study 2B), and high vs. low level of COT (Study 2C).

Method

Participants

Sixty students from an Indian Institute of Management were randomly allocated to each study. The participants for Study

2A ($n = 25$ females; $n = 35$ males) had a mean age of 19.68 years and $SD = 0.91$. The participants for Study 2B ($n = 28$ females; $n = 32$ males) had a mean age of 19.51 years and $SD = 0.98$. The participants for Study 2C ($n = 26$ females; $n = 34$ males) had a mean age of 19.61 years and $SD = 0.94$. Participation in the study was voluntary and no compensation was provided to the students. Participants were assured that their responses would remain anonymous. After obtaining participants informed consent, the survey was administered with the help of two research assistants. The research assistants collected data over a period of time from students across campus. Average time taken to complete the survey was 15 min.

Procedure

Data were collected through questionnaires using the vignettes and the items defined in Study 1. The three studies used three different questionnaires corresponding to DMD, BIS, and COT (independent variables). The purpose of each study was to test the relationship of high vs. low level of an independent variable with thriving in a between-subjects

research design. Therefore, each study used two versions of a questionnaire; one with a scenario (vignette) for high level of DMD, BIS, or COT, and the other with a scenario (vignette) for low level of DMD, BIS or COT. Use of vignettes ensured that the responses were not influenced by social desirability bias.

For each study, 30 students were assigned each version of the questionnaire on a random basis. Each student responded to items on one independent variable (DMD, BIS or COT) and thriving for one scenario. Tests revealed no statistical difference in the demographics of the students assigned to the two scenarios for each study.

Measures

For DMD, BIS and COT, item scales created in Study 1 were used. Measure for thriving was adapted from an established 10-item scale (Porath et al., 2012). The scale included five items each on vitality and learning (the two dimensions of thriving) with two items reverse coded. Sample items are “While doing this assignment, you would often get new insights about the course,” “You would see yourself getting continuously better at the selected concepts” and “You would feel alive and vital while doing this assignment.” The participants responded to the items on the questionnaires on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*).

Exploratory factor analysis indicated the two factors corresponding to the items for vitality and learning. All 10 items were retained after EFA since all had accepted factor loading and no cross loading. Thriving scale also had acceptable reliability ($\alpha = 0.78$). Factor loading and Cronbach's Alpha for all items are provided in **Table 1**.

Results and Discussion

The mean statistic for the variables was used to conduct *T*-tests. Results of manipulation check showed that there was significant difference between the vignettes representing high and low DMD [$t(58) = 3.04, p < 0.01, d = 0.78$] in Study 2A, high and low BIS [$t(58) = 2.31, p < 0.05, d = 0.58$] in Study 2B, and high and low COT [$t(58) = 3.4, p < 0.01, d = 0.88$] in Study 2C. This supported manipulation of the situations.

Two-sided *t* tests were conducted to examine the relationship of DMD, BIS and COT with thriving. Results of Study 2A revealed that thriving was significantly different between high and low DMD [$t(58) = 4.07, p < 0.05, d = 0.64$]. Results of Study 2B revealed that thriving was significantly different between high and low BIS [$t(58) = 3.98, p < 0.05, d = 0.57$]. Results of Study 2C revealed that thriving was significantly different between high and low COT [$t(58) = 4.11, p < 0.05, d = 0.83$].

The results of Study 2A, 2B and 2C denoted that DMD, BIS and COT significantly related to thriving. This empirical finding confirmed existing theoretical literature (Spreitzer and Porath, 2014), and indicated that the nature of the relationships could be further investigated. Thus, we proceeded to examine these relationships in detail, along with the role of SDT, through a field study.

STUDY 3

The objective of Study 3 was to investigate the relationship of DMD, BIS and COT with thriving, and the mediating role of autonomy (NAT), competency (NCM) and relatedness (NRL) (based on SDT). To enable this process, we conducted a field study on a sample of management students.

Method

Participants

Ninety-two students ($n = 34$ females; $n = 58$ males) from an Indian Institute of Management participated in the study. The mean age was 28.72 years and $SD = 0.64$. Participation in the study was voluntary and no compensation was provided to the students. Participants were assured that their responses would remain anonymous. After obtaining participants informed consent, the survey was administered with the help of two research assistants in the classroom. Average time taken to complete the survey was 20 min.

Procedure

As a part of the course on “Positive Organizational Psychology,” we designed an assignment on the basis of which we could collect data. The assignment required students to collect stories of their best selves from individuals who knew them well, and analyze their own stories to distil their signature strengths. The instructor encouraged the students to invest in the assignment, provided the submission guidelines in detail and supported the students throughout. Participants responded to a questionnaire survey administered to them 2 days after submission of the assignment.

To prevent consistency bias, the survey was designed such that the participants had to provide their response to items on Thriving, followed by NAT, NCM, NRL and DMD, BIS and COT in the given order. At the end of the survey, they had to answer questions on demographics.

Measures

Since Study 3 was a field study, we adapted the item scales used in the experimental studies 2A, 2B and 2C, for DMD, BIS and COT and Thriving. The statements were framed in the past tense since data had to be captured regarding an actual assignment that had been conducted earlier.

Scales for NAT, NCM and NRL were adapted from existing scales (**Table 2**). The participants responded to the items on the questionnaires on a scale ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). They also provided information on age and gender, which were used as control variables. Factor loading and Cronbach's Alpha for all selected items are provided in **Table 2**.

Measure for NAT was adapted from an established six-item scale (Broeck et al., 2010). Sample items are “You felt that you can do the assignment being yourself,” “If you could choose, you would have done your assignment differently” and “The way you were required to do the assignment was in line with how you really wanted to do it.” EFA resulted in dropping of one item due to poor factor loading. The NAT variable with the remaining five items had acceptable reliability ($\alpha = 0.75$).

TABLE 2 | Item scales for study 3.

S. No	Item scales	Factor loading
A	Decision-making Discretion ($\alpha = 0.79$)	
1	You had the autonomy to do the assignment the way you wanted to	0.79
2	You felt the freedom about how you wanted to do the assignment	0.75
3	You were free to select stories from any time in your life	0.72
4	You felt in control about what you wanted to do in the assignment	0.71
5	You could choose how short you wanted to make the assignment	0.61
B	Broad information sharing ($\alpha = 0.80$)	
1	You knew the different sections which would constitute the assignment	0.78
2	You were aware about the layout to be used for the assignment	0.77
3	You had been told about the structure and flow of the assignment	0.73
4	You knew how you would go about collecting information about your assignment	0.72
5	You had information about the format of the assignment	0.72
C	Climate of trust ($\alpha = 0.88$)	
1	The faculty made it comfortable to seek clarifications	0.86
2	The faculty provided a secure environment for exchanging ideas and doubts	0.85
3	You could rely on the faculty for giving honest feedback	0.81
4	The faculty valued your opinion and perspectives	0.80
5	The faculty made it possible to improve assignment quality through open discussion	0.80
D	Autonomy ($\alpha = 0.75$)	
1	You felt that you can do the assignment being yourself	0.86
2	While doing the assignment, you did not feel constrained by the instructions provided by your faculty	0.81
3	If you could choose, you would have done your assignment differently	0.72
4	The way you were required to do the assignment was in line with how you really wanted to do it	0.68
5	You were free to do the assignment the way you thought it could best be done	0.67
E	Competence ($\alpha = 0.85$)	
1	You felt that you could do the assignment exactly the way you wanted to	
2	You could master the way of doing the assignment	0.84
3	You felt competent about doing the assignment well	0.81
4	You were good at doing the assignment	0.80
5	You felt that you could accomplish even the most difficult part of the assignment	0.79
6	You knew exactly how to do the assignment	0.70
F	Relatedness ($\alpha = 0.33$)	
1	In class, you felt part of the group of people who were working on the same assignment	0.84
2	You could approach your faculty with questions/doubts regarding the assignment	0.84
3	In class, you could talk with your faculty about things that really mattered to you concerning the assignment	0.82
4	You could depend on your faculty to listen to your ideas	0.81
5	Some of your classmates are close friends with whom you could discuss the assignment	0.64
G	Thriving ($\alpha = 0.78$)	
1	While doing the assignment, you often got new insights about the selected concepts	0.78
2	You continued to learn more, as you spent more time on this assignment	0.73
3	You saw yourself getting continuously better at the selected concepts	0.71
4	Doing this assignment did not make you learn anything (R)	0.70
5	While doing this assignment, you developed a lot as a student of this course	0.69
6	You felt alive and vital while doing this assignment	0.63
7	The assignment gave you energy and spirit	0.69
8	You did not feel very energetic about doing the assignment (R)	0.68
9	Doing this assignment made you feel alert and awake	0.64
10	You looked forward to each day you worked on this assignment	0.63

α , Cronbach's alpha; R, reverse coded; N = 92.

Measure for NCM was adapted from an established six-item scale (Broeck et al., 2010). Sample items are “You could master the way of doing the assignment,” “You felt

competent about doing the assignment well” and “You knew exactly how to do the assignment.” Post EFA, all items were retained due to acceptable factor loading. The NCM

variable with the selected six items had acceptable reliability ($\alpha = 0.85$).

Measure for NRL was adapted from an established six-item scale (Broeck et al., 2010). Sample items are “You could approach your faculty with questions/doubts regarding the assignment,” “You could depend on your faculty to listen to your ideas” and “In class, you could talk with your faculty about things that really mattered to you concerning the assignment.” EFA resulted in dropping of one item due to poor factor loading. The NRL variable with the remaining five items had very poor reliability ($\alpha = 0.33$). Therefore, we could not consider NRL for further analysis, and had to drop this variable from our model. Thus, Hypotheses 1c, 2c and 3c remained untested.

Results and Discussion

The descriptive statistics for the variables with the retained items are provided in **Table 3**. We conducted a series of regression analysis using the approach suggested by Barron and Kenny (1986). Results based on standardized coefficients are as follows: a) DMD ($\beta = 0.24, p < 0.05$), BIS ($\beta = 0.21, p < 0.05$) and COT ($\beta = 0.27, p < 0.01$) were all significantly related to thriving; b) DMD ($\beta = 0.48, p < 0.001$) and COT ($\beta = 0.31, p < 0.01$) were significantly related to autonomy, but BIS ($\beta = -0.03, ns$) was not; c) all DMD ($\beta = 0.23, p < 0.05$), BIS ($\beta = 0.31, p < 0.01$) and COT ($\beta = 0.26, p < 0.01$) were significantly related to competence; d) competence ($\beta = 0.56, p < 0.001$) was significantly related to thriving, but autonomy ($\beta = 0.16, ns$) was not. These results suggest that all three independent variables are associated with thriving, and competence has a mediating role to play.

To confirm the results obtained above, we conducted a hierarchical regression analysis containing all the variables. Hierarchical regression allows examining the effect of independent variables on the dependent variables in an incremental manner. It helps to understand the direct relationship between independent and dependent variables, as well as the impact of intervening (or mediating) variables on these direct relationships, and thus enables testing of mediation relationships. Results of the analysis are provided in **Table 4**. Regression consisted of three models. Model 1 included only the control variables. Model 2 included the independent variables comprising DMD, BIS and COT also. Model 3 included the mediating variables comprising NAT and NCM also.

Results showed that the model fit increased in significance with the inclusion of independent variables [Model 2: $F(5, 86) = 11.28, p < 0.001, \Delta R^2 = 0.46$]. Thriving was positively related to DMD (Model 2: $\beta = 0.37, p < 0.01$), BIS (Model 2: $\beta = 0.23, p < 0.05$) and COT (Model 2: $\beta = 0.23, p < 0.05$). This confirmed the results obtained earlier. Thus, Hypotheses 1, 2 and 3 found support.

When autonomy and competence were included in regression, the model fit increased in significance [Model 3: $F(7, 84) = 12.42, p < 0.001, \Delta R^2 = 0.12$]. In particular, competence had a significant intervening role (Model 3: $\beta = 0.48, p < 0.001$) whereas autonomy did not (Model 3: $\beta = -0.06, ns$). This supported the results obtained earlier, suggesting that competence mediated the relationship of all independent variables with thriving, but

autonomy did not. Thus, Hypothesis 1a, 2a and 3a did not find support, and Hypotheses 1b, 2b and 3b found support.

Table 4 also showed that inclusion of Model 3 weakened the relationship of DMD with thriving (Model 3: $\beta = 0.28, p < 0.05$), but made the relationship of BIS (Model 3: $\beta = 0.07, ns$) and COT (Model 3: $\beta = 0.12, ns$) with thriving completely insignificant. This indicates that competence partially mediated the relationship between DMD and thriving, and fully mediated the relationship between BIS and thriving, and COT and thriving.

To summarize, the results of Study 3 showed that DMD, BIS and COT were significantly related to thriving. The relationship for DMD, BIS and COT was mediated by competence. However, autonomy had no role to play in determining the relationship of these factors with thriving.

GENERAL DISCUSSION

The purpose of this research was to empirically examine the relationship of environmental factors (namely, DMD, BIS and COT) with thriving, and the role of SDT in determining this relationship. The environmental factors were based on the conceptual literature on select organizational characteristics that have been theoretically explored for their influence on thriving (Spreitzer et al., 2005). We conducted these experiments with the students at an Indian Institute of Management. These management students would be joining various organizations as future employees. Our study is indicative of the effect of environmental factors of DMD, BIS, and COT on thriving in the organizational context.

The research involved the following activities: establishing DMD, BIS and COT as three independent constructs, defining valid and reliable measure for each one of them, statistically testing their relationship with thriving, and examining the intervening role of the dimensions of SDT (namely need for autonomy, need for competence and need for relatedness). The research was carried out using five studies (**Supplementary Appendix B**). Study 1 involved experimental vignettes to establish the validity and reliability of the measures for DMD, BIS and COT. It confirmed them as three distinct constructs with valid and reliable scales. It also established validity of the vignettes. Study 2A, 2B and 2C used the same experimental vignettes to investigate the relationship of DMD, BIS and COT with thriving. They confirmed the significant relationship of these three factors with thriving. Study 3 involved a field survey to test the hypotheses regarding the direct role of DMD, BIS and COT, and the mediating role of autonomy, competence and relatedness, in determining thriving. The results showed that DMD, BIS and COT related to thriving as hypothesized. However, mediation was indicated only for competence. Competence partially mediated the relationship of DMD, and fully mediated the relationship of BIS and COT with thriving. However, autonomy did not have a significant intervening influence. Relatedness could not be tested due to poor reliability of items. The research indicated that a) the selected environmental factors of DMD, BIS and COT are associated with thriving; b) this association is mainly because of

TABLE 3 | Means, standard deviation and inter-correlations for study 3.

Variables	M	S.D.	1	2	3	4	5	6	7	8
1 Gender	0.20	0.40	1.00							
2 Age	28.72	0.64	0.05	1.00						
3 Decision Making Discretion	4.57	1.06	-0.20*	0.04	1.00					
4 Broad Information Sharing	5.33	1.02	-0.01	0.04	0.45***	1.00				
5 Climate of Trust	5.37	1.09	-0.12	-0.13	0.51***	0.52***	1.00			
6 Autonomy	4.00	1.38	-0.13	-0.13	0.55***	0.29**	0.52***	1.00		
7 Competence	4.41	1.20	-0.09	-0.07	0.53***	0.58***	0.58***	0.48***	1.00	
8 Thriving	4.19	1.42	-0.04	0.09	0.59***	0.53***	0.52***	0.38**	0.70***	1.00

N = 92. **p* < 0.05; ***p* < 0.01; and ****p* < 0.001. One tailed significance values are reported.

fulfillment of the need for competence; c) competence tends to be the only dimension of SDT that has a role to play in determining this association.

Previous studies had conceptualized environmental factors like DMD, BIS and COT in the context of SDT and thriving. However, empirical literature on these variables was absent, and measures did not exist for them. This research empirically established them as three independent constructs by defining item scales for each one of them, testing them through experimental vignettes and confirming their discriminant validity, convergent validity and reliability. By enabling these constructs with the associated measures for further research, the paper contributes to the literature on organization factors that may promote individual performance (Porath et al., 2012; Goh et al., 2021).

The paper empirically confirmed that DMD, BIS and COT related to thriving due to satisfaction of the need for competence. The results suggest that organizations can promote individual thriving by enhancing their competence, through an environment that allows discretion to make decisions, sharing of information and a climate of trust. They thus imply that organizations can prioritize certain environmental conditions,

which make individuals more competent, in order to make them thrive. By empirically highlighting the critical importance of satisfaction of the need of competence (vis-à-vis autonomy) for determining individual thriving, this paper extends the literature on thriving (Spreitzer et al., 2005) and competence (Bunderson and Sutcliffe, 2002).

The results show that competence partially mediates the relationship between DMD and thriving, and fully mediates the relationship of BIS and COT with thriving. This implies that individuals, who are given the discretion to make decisions, may demonstrate thriving behaviors, because this condition also satisfies their need for competence. Further, individuals with whom broad information is shared, and who work in a climate of trust, may demonstrate thriving behaviors, just because these conditions satisfy their need for competence. The empirical findings underscore the process by which organizational factors promote individual thriving. This adds to the literature on antecedents of thriving (Porath et al., 2008).

The findings also demonstrate that the discussed organizational factors do not satisfy the need for autonomy. This suggests that autonomy has no contribution to make in determining the relationship of these factors with thriving. As the results show significance of only competence, it can be argued that SDT (with all three dimensions) does not explain the role of organizational initiatives in encouraging individual thriving. This further adds to the literature on thriving (Spreitzer et al., 2012).

TABLE 4 | Hierarchical regression for thriving.

Predictor variables	Model 1	Model 2	Model 3
Control Variables			
Gender	0.04	0.06	0.07
Age	0.09	0.09	0.11
Independent Variable			
Decision Making Discretion		0.37**	0.28*
Broad Information Sharing		0.23*	0.07
Climate of Trust		0.23*	0.12
Mediating Variables			
Autonomy			0.06
Competence			0.48***
R ²	0.01	0.47	0.58
ΔR ²	0.01	0.46	0.12
Adjusted R ²	0.02	0.43	0.54
F	0.31	11.28***	12.42***
ΔF	0.31	18.43***	8.58**

N = 92. **p* < 0.05; ***p* < 0.01; and ****p* < 0.001.

All coefficients are standardized; One-tail significance values are reported.

Practical Implications

Thriving plays a critical role in sustaining physical health as well as promoting positive workplace behavior (Keyes, 2002). It provides an array of positive outcomes for employers. Thriving employees are keen at taking career development initiatives and forming supportive and successful relationships with co-workers (Parker and Sprigg, 1999; Porath et al., 2008). Supervisors' rate them as high performers. By generating new ideas, and seeking new ways of working, thriving employees exhibit more innovative work behavior (Carmeli and Spreitzer, 2009). Thriving is also linked with lower burnout and fewer physical or somatic grievances. Besides, it is found to be related to positive affect, learning goal orientation, proactive personality, and core self-evaluation (Porath et al., 2012). Therefore, it is beneficial for organizations to promote thriving both from the perspective of organizational performance, and employee satisfaction and development.

According to the findings of the paper, organizations should define norms, policies and processes to encourage employee discretion in decision-making, maintain a consistent and effective flow of important and useful information to employees, and create a climate of mutual trust across employees, hierarchical levels and departments. They can assess effectiveness of such norms, policies and processes by collecting data on employee competence on a regular basis. To ensure satisfaction of the need for competence, organizations can identify related enterprise-wide initiatives that can increase employee competence. Examples are focused and measured training programs, job rotation, job enhancement, performance feedback mechanism, and coaching and mentoring.

Limitations

Despite the theoretical and empirical contribution of the studies, the paper also has a few limitations. We could not investigate need for relatedness because of unacceptable reliability of the measure. Compared to the reliability of other dimensions of SDT, reliability of relatedness was very low. A possible reason can be the prior inter-personal relationships of the respondents within the sample. It is likely that some respondents already related to their peers and faculty very well outside the class, and others did not. The internal classroom environment or the specific assignment did not notably influence their degree of relatedness with their peers and faculty. Another limitation of the study pertains to the relevance of our findings in other cultural contexts. We conducted these experiments with the Indian management students. These findings might be relevant to other management students in similar cultures. However, further studies might be needed to assess if these findings tend to be true for students in other contexts.

Future Research Avenues

We conducted our empirical research on students to enable a controlled environment for defining the measures for environmental factors, creating and testing vignettes and validating the previously defined conceptual framework (Spreitzer and Porath, 2014). To confirm the findings on the environmental determinants of individual thriving, the next step would be to replicate this research across organizations and employees. This would help verify the applicability of the framework in the organizational context. Besides, this would enable comparison of the significance of different environmental factors for thriving, and of the intervening role of SDT across educational and organizational environments.

The paper has established DMD, BIS and COT as constructs, and provided valid and reliable measures for them. Future research can further explore these constructs in terms of a) their antecedents (e.g., leadership, structure and culture), and b) other consequences (e.g., organizational citizenship behavior, employee commitment, job engagement). This would facilitate a detailed understanding about the organizational characteristics that would promote a conducive environment for employee performance.

The results show that satisfaction of the need for autonomy is just one of the ways in which individual discretion to make

decisions can relate to thriving. Future research can try to identify the other consequences of this discretion that bring about thriving. This might also open the doors to other theories (apart from SDT), that might explain the association of environmental factors with thriving.

CONCLUSION

The purpose of this paper was to use empirical research to validate an existing conceptual framework on the relationship of select environmental factors (DMD, BIS and COT) with thriving, and the intervening role of SDT. The research was conducted in three stages through multiple studies. In the first stage, we defined vignettes and scales for the environmental factors, and collected data to establish their validity and reliability. In the second stage, we verified the relationship of these factors with thriving. In the third stage, we examined the combined association of these factors with thriving, considering their role in satisfying need for autonomy, competence and relatedness. The findings suggested partial support for the conceptual framework. The environmental factors related to individual thriving mainly due to satisfaction of the need for competence. The paper highlights certain steps organizations can take to make the workforce happy, and help them thrive. We hope that it effectively paves the way for empirical research in different organizational contexts to affirm the process by which these environmental factors are related to employee performance.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

RC: conception of the study, variables, literature review, formation of hypotheses, data collection, and interpretation. SC: research design, introduction, analysis, interpretation, and discussion. Both authors contributed to the article and approved the submitted version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.795262/full#supplementary-material>

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Experiences of Clinical Clerkship Students With Mindfulness-Based Stress Reduction: A Qualitative Study on Long-Term Effects

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Purpose: To explore the mindfulness practice, its long-term effects, facilitators and barriers, in clinical clerkship students 2 years after participation in an 8-week mindfulness-based stress reduction (MBSR) training.

Method: A qualitative study was performed by semi-structured in-depth interviews with 16 clinical clerkship students selected by purposive sampling. Students had participated in a MBSR training 2 years before and were asked about their current mindfulness practice, and the long-term effects of the MBSR training. Thematic analysis was conducted using the constant comparison method. Data saturation was reached after 16 interviews.

Results: Most interviewees were still engaged in regular, predominantly informal, mindfulness practice, although some discontinued mindfulness practice and reported an “*unchanged lifestyle*.” Three main themes came forward; (1) “*focused attention and open awareness*” during daily activities as core elements of long-term mindfulness practice; (2) “*changes in behavior and coping*” that resulted from taking a pause, reflecting, recognizing automatic behavioral patterns and making space for a conscious response; (3) “*integration in personal and professional life*” by enhanced enjoyment of daily activities, improved work-life-balance and making different career choices. Barriers and facilitators in starting and maintaining mindfulness practice were (1) understanding and intention as “*pre-conditions*”; (2) practical, personal, and professional factors of students in maintaining practice.

Conclusion: Two years after participation in a MBSR training, many interviewees were still engaged in (mostly informal) mindfulness practice contributing to both personal and professional changes. In light of the high clerkship demands, MBSR training could be a valuable addition to medical curricula, supporting medical students in developing necessary competencies to become well-balanced professionals.

Keywords: mindfulness, positive psychology, positive education, wellbeing, medical student, qualitative research

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INTRODUCTION

Managing the high demands of healthcare requires physicians to be well-balanced and healthy. The CANMEDS physician competency framework, which is currently used in many medical curricula worldwide, describes a “medical expert” as a communicator, collaborator, leader, health advocate, scholar, and professional (Frank et al., 2015).

Physicians' commitment to their own positive (mental) health and wellbeing is part of the “professional role.” Especially, when considering that physicians (in training) and medical students are exposed to multiple stressors of academic, clinical, and psychosocial origin, including high workload, exposure to human suffering and death, and difficulties in work-life balance. High levels of stress in these professionals are associated with symptoms of depression and burn-out, and lower self-reported quality of life (Prins et al., 2010; Haldorsen et al., 2014; Naji et al., 2021), in particular millennials (Hill et al., 2018). Psychological distress in medical students and residents is associated with a decrease in empathy (Neumann et al., 2011), which may negatively affect quality of patient care and safety (Shanafelt et al., 2002). Importantly, training in (self-)compassion could promote medical students' health and enhance clinical care (Weingartner et al., 2019; Dev et al., 2020). Although self-awareness is explicitly mentioned in the CANMEDS framework, most medical curricula do not provide (explicit) tools for developing this skill. A qualitative study in medical and surgical residents indicated that Mindfulness-Based Stress Reduction (MBSR) training could serve as a tool to cultivate professional competencies like (self-) awareness, self-acceptance, resilience, self-care, and work-life balance (Verweij et al., 2018).

Mindfulness-based stress reduction is a standardized 8-week group training developed by Jon Kabat-Zinn to improve self-awareness and compassion, including formal meditation, psycho-education, and practice integrated in daily activities (Kabat-Zinn, 1982). Participants are encouraged to change unhelpful automatic patterns, enhance self-care and adopt a non-judgmental attitude. A recent review investigating benefits of MBSR training for undergraduate medical students including nine studies showed that the training is associated with improved psychological wellbeing and self-compassion, although effects on empathy were mixed (Polle and Gair, 2021). A recent Cochrane review (Kunzler et al., 2020) on psychological interventions to promote resilience in healthcare students reported five published studies (Warnecke et al., 2011; Eroglu et al., 2014; Smeets et al., 2014; Galante et al., 2018; Barry et al., 2019) focusing on mindfulness interventions. The results indicated positive effects on resilience, anxiety, and depression, but more research is needed particularly with a longer follow-up period.

Until now, most research about mindfulness interventions is performed in undergraduate students, while research in clinical clerkship students seems to be scarce. One study in clinical clerkship students reported that an adapted 4-week twice a week mindfulness elective resulted in a reduction of depression, emotional exhaustion and perceived stress as well

as an increase of self-compassion and mindfulness (Garneau et al., 2013). A randomized controlled trial (RCT) demonstrated that clerkship students completing MBSR training reported a reduction of psychological distress and an improvement of positive mental health over the course of a 20-month follow-up period (van Dijk et al., 2017).

Moreover, quantitative research has dominated this field thus far (Dobkin and Hutchinson, 2013). Two qualitative studies identified themes which may provide more in-depth exploration of the quantitative results. The first study evaluated experiences of pre-clinical medical and psychology students shortly after completion of an abridged mindfulness training and reported two main themes “understanding mindfulness” and “engaging in mindfulness,” both influencing each other (Solhaug et al., 2016). Another study in undergraduate medical students reported that a 7-week MBSR training was associated with high levels of satisfaction when delivered on an optional basis (Aherne et al., 2016). A recent qualitative review (Crowther et al., 2020), which included 16 studies evaluating various mindfulness interventions in relatively small cohorts of mainly female undergraduate health and social care students, reported beneficial effects on stress reduction, self-compassion, peer cohesion and support, ability to attend patients by staying present, enhanced listening, insights into health culture, and lifestyle adjustments. However, several issues remain to be considered, including the most suitable moment of this training in the curriculum, short and long-term impact on personal and professional life, and contributing factors of adherence and maintenance of mindfulness practice. Therefore, the aim of the current qualitative study is to explore the nature of mindfulness practice in clinical clerkship students, its possible effects and facilitators and barriers 2 years after their participation in MBSR training.

MATERIALS AND METHODS

Study Design and Setting

A qualitative interview study was performed with clinical clerkship students from the Radboudumc in Nijmegen, Netherlands, who previously participated in a RCT examining the effect of MBSR training on wellbeing (van Dijk et al., 2017). The present study evaluated the long-term effect of MBSR training by interviewing students who ended this training at least 18 months ago about their experiences after the training. Semi-structured interviews were conducted to let the participants talk freely with structured guidance from the interviewer using an interview guide (see **Supplementary Material**). Individual interviews created the opportunity for students to openly speak their minds without the risk of mutual influence or mainly politically correct answers.

The medical curriculum of the Radboudumc consists of 3 years of preclinical bachelor study and 3 years of master study, which involve rotating through a fixed order of hospital placements alternated with short periods of didactic classroom teaching.

The Consolidated criteria for Reporting Qualitative research (COREQ) (Tong et al., 2007) and the Standards for Reporting

Qualitative Research (SRQR) (O'Brien et al., 2014) were applied in reporting the results. The study was approved by the ethical committee of the Radboudumc, Nijmegen (CMO no. 2010/388; ABR no. NL33969.091.10).

Participants

In the present study, all participants allocated to the intervention group (MBSR training) from the previous RCT (van Dijk et al., 2017) were eligible ($n = 83$). Purposive sampling was used to collect in-depth information from a wide selection of clinical clerkship students. The selection was based on gender, clerkship group, MBSR trainer, time since MBSR and evaluation of training by the students expressed in a grade from 0 to 10 (see **Table 1**). The aim of purposefully selecting students based on these criteria was to obtain a wide variety in answers during the interviews.

The intervention in the RCT consisted of a MBSR training with eight weekly 2 h sessions (from 4.30 p.m. to 6.30 p.m.). The trainings took place between February 2011 and September 2012 and were taught by a psychiatrist (AS) and a physician, who both met the standards of good practice guidelines for teaching mindfulness-based courses (Crane et al., 2012). The program consisted of formal mindfulness exercises (bodyscan, meditation, yoga), informal exercises during daily life activities, psycho-education about different topics, group dialogue and daily home practice.

TABLE 1 | Characteristics of interviewed clerkship students and non-participants from Radboudumc, Nijmegen, Netherlands (2013–2014), 2 years after participation in mindfulness-based stress reduction training.

No.	Gender	Evaluation of training by students (grade 0–10)	Age at time of interview (years)	Time between training and interview (months)
Participants				
1	Female	8	27	23
2	Male	8	27	23
3	Female	7	25	31
4	Female	9	29	29
5	Female	6	26	22
6	Male	8	26	31
7	Female	8	31	26
8	Female	7	27	24
9	Female	8	24	25
10	Female	7	24	28
11	Female	7	27	24
12	Male	7	24	22
13	Female	7	23	18
14	Male	9	26	35
15	Female	6	45	35
16	Female	7	25	23
Mean (SD)			27.3 (5.1)	26.2 (4.9)
Median (range)		7 (6–9)		
Non-participants				
1	Female	7	(No response to phone and email)	
2	Female	7	(Not possible to plan appointment)	

Data Collection

The in-depth face-to-face interviews took place between October 2013 and March 2014. Students were approached by telephone and were informed about the study. Students interested to participate were sent an information letter and after a couple of days an interview was scheduled by telephone.

In general, the interviews were held at the department of Primary and Community Care of the Radboudumc, which was an unfamiliar, neutral area for the students. Due to practical reasons, one interview was conducted by an online video call due to removal and one at the student's home due to illness.

Prior to the interview, confidentiality was assured and the process of the interview was explained. An interview guide was used containing the main questions related to the research questions. The guide included questions about the long-term effects of MBSR training on personal life, current benefits in professional life, evaluation of the training and barriers and facilitators to maintain mindfulness practice. The interviews were performed by two researchers, took 21–44 min, and were audiotaped after consent. An anonymized short summary of each interview was e-mailed to the student for approval. The coordinating researcher (IvD) kept a log containing notes about the process and content of data collection and analysis. The interview guide underwent minor adaptations based on discussions after each interview as part of the iterative process to maximize the exploration of possible missing topics. The final (fifth) version is provided in **Supplementary Material**. Data saturation was reached after 16 interviews, meaning that the ability to obtain additional new information was attained.

Interviewers

Two female interviewers, not previously known to the students, conducted the individual interviews. The coordinating researcher (IvD) was a 34-year old psychiatrist in training who participated in a 2-year post academic traineeship to become MBSR teacher. The second interviewer was a 40-year old coordinator of healthcare programs in primary care, and a psychologist in training. This interviewer completed an 8-week MBSR and was therefore familiar with mindfulness terminology.

Analyses

All interviews were fully transcribed. The anonymized transcripts were independently analyzed by two researchers who also conducted the interviews. The analyses were conducted with the aid of qualitative analysis tool of Atlas.ti GmbH Version 7 (Berlin, Germany). A process of constant comparison was used, originating from the grounded theory (Glaser and Strauss, 1967). At first, the researchers independently read and coded the transcribed text of each interview, and stayed semantically close to the participants' wording (open coding). In a second step, the process of grouping codes into overarching categories was started after coding the first four interviews (axial coding). During this inductive coding process, the researchers discussed the findings until mutual agreement was achieved. Thirdly, connections between categories were examined to form overarching themes (selective coding). The constant iteration of these steps led to a deep understanding of the effects of MBSR training, and the

barriers and facilitators in starting and maintaining mindfulness practice in clinical clerkship students. Halfway the process of coding and categorizing, the interim results were discussed at a research meeting for mindfulness researchers of the Radboudumc to get a better understanding of the possible relationships between categories and themes, and to prevent tunnel vision.

RESULTS

Three main themes related to the nature and effects of students long-term mindfulness practice came forward; (1) *focused attention and open awareness* during daily activities as core elements of long-term mindfulness practice; (2) *changes in behavior and coping* that resulted from practice, such as taking a pause, reflecting and recognizing automatic behavioral patterns; (3) *integration in personal and professional life*.

In total, 18 clinical clerkship students were approached to be interviewed. Two students did not participate: one showed interest initially, but did not respond to follow-up contact while the second agreed to participate but no meeting could be arranged within the requested time period. **Table 1** summarizes characteristics of participating and non-participating students.

The 16 interviews resulted in a total of 155 codes in 42 categories combined in eight subthemes in three main

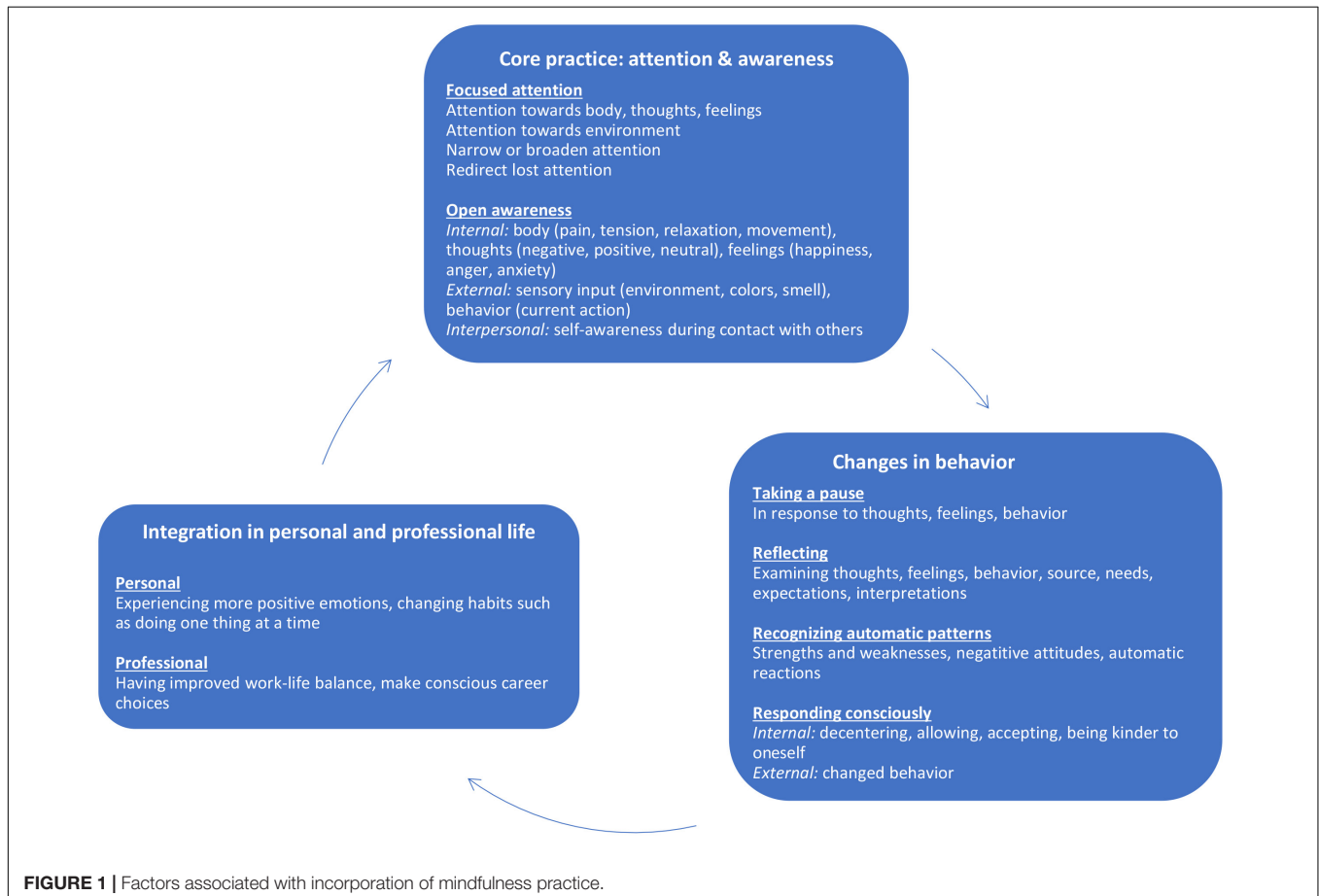
themes (see **Figure 1**). Some interviewees reported that they had discontinued practice and hence did not notice any changes in lifestyle as a consequence of MBSR training. Usually when an interviewee felt no need, he/she already used other ways of increasing wellbeing such as sports or prayer:

“It is more that I don’t feel the need for it, as it seems. I’m a Muslim and then you already pray five times a day and have a moment of contemplation and rest, that is already built in for you.”
[Interviewee 14]

Figure 1 visualizes the three themes, subthemes and their relationship. All interviewees elaborated on one or more of these themes. A number of interviewees stated in the beginning of the interview that they did not engage in mindfulness practice anymore because they stopped using formal meditation exercises. However, when they were asked about informal practice they realized that they *had* integrated aspects of mindfulness practice into their life.

Focused Attention and Open Awareness

The core of students’ long-term mindfulness practice, described by almost all students, existed of consciously paying attention to sensory perceptions during daily activities or using a short mindfulness exercise (e.g., 3 min breathing space). In all cases this



focus of attention was directly linked to an enhanced awareness during the activity, for example, when brushing their teeth or taking a walk:

“When I’m taking a walk in the forest I stand still, take a deep breath and just notice the forest without being occupied with other things.”
[Interviewee 8]

Changes in Behavior and Coping

Being more aware of a situation supported students in dealing with it differently by taking a pause, reflecting on the situation or by recognizing automatic behavioral patterns:

“I really thought well yes, I’m always trying to do everything at once. So that was an insightful moment. When I brushed my teeth then I would do three other things while brushing my teeth instead of brushing them consciously.” [Interviewee 13]

Taking a pause created space for a conscious *internal* response, for example, by allowing emotions instead of repressing them or by decentering from negative thoughts:

“Well, if I have those crazy thoughts like ‘life isn’t worth living anymore’ then I can think ‘it is just a thought’ and it feels as if I can look at it from a distance instead of diving further into it.”
[Interviewee 4]

Occasionally, students mentioned that they could easier accept a difficult situation or feeling:

“When experiencing tension or stress, before I wanted it to go away, I didn’t want to feel it. The training taught me another way to deal with it: ‘ok, well, that is the way it is.’” [Interviewee 1]

A conscious response could also be *external* existing of different behavior, for example, when a computer doesn’t work properly:

“I just sit back and wait, often you can see on screen that it is ‘thinking’ or that it restarts. Then I just wait until maybe it solves itself. Normally I would have pushed all buttons and would have called someone for help, but now I first just wait.” [Interviewee 11]

INTEGRATION IN PERSONAL AND PROFESSIONAL LIFE

Personal

Sometimes paying more attention and being more aware of daily activities, *directly* resulted in feeling better and enjoying life more:

“That you cycle home and just take the time to enjoy the nice ride. That the birds are singing and the sun is shining, those kind of things. That the trees are beautiful, well, those are things that I didn’t really pay attention to in the past.” [Interviewee 11]

In other situations, quality of life *indirectly* increased as a result of their changed ways of coping, for example, by letting go of dysfunctional patterns:

“I used to be preoccupied with other people’s opinions of me, so badly that I couldn’t even listen to what they would say. That has become less and less.” [Interviewee 4]

Professional

A number of students reported an improved work-life balance as a result of setting more boundaries, expressing their opinion toward superiors and learning not to take work problems home:

“I became more aware that I have to separate work from private life. Go home without taking work problems home. For example, if I’ve seen a complex patient I first discuss it with a colleague and then put it to rest without taking it home.” [Interviewee 11]

Some students even explained how the increased awareness of work-life balance supported them in making a conscious career choice:

“Because of that, I started thinking about if I wanted to work in the hospital or outside the hospital. I noticed that there is a big difference in how people treat each other in the hospital, which I experience as more stressful.” [Interviewee 9]

BARRIERS AND FACILITATORS IN STARTING AND MAINTAINING MINDFULNESS PRACTICE

Preconditions for Practice: Understanding and Intention Understanding

The understanding of what mindfulness is and how it could be integrated into students’ lives influenced their decision whether or not to continue practice after the training. An unrealistic or incorrect understanding discouraged students from practicing, for example, one student defined mindfulness as a way to distract yourself from distress that was not perceived as useful. For another student gaining a better understanding of mindfulness was the only long-term result reported:

“... at least I know what it is now and I’m actually happy with that.”
[Interviewee 10]

Intention

Next to a realistic understanding, also the intention to practice appeared a precondition, which was related to students’ considering whether now would be “the right time” for practice. A lack of intention resulted in long-term post-poning:

“Well, what I do think is that in a few years it’ll possibly do something and then I will at least have the tools and will be able to use them. But I think that now I’m just not ready yet. That’s it.”
[Interviewee 7]

Factors in Maintaining Mindfulness Practice Practical

Practical aspects such as lack of time and not having a space to practice were often mentioned as barriers for practice. Although students were satisfied that the training took place in the beginning of their clerkships, their busy schedule and lack of autonomy caused them to practice at best around 15 min a day. As a result, some students felt insufficiently equipped to maintain their practice.

Personal

As mentioned before, students' understanding of mindfulness and their intention were the most important factors in whether or not they maintained their practice. Practicing only the formal and informal exercises that they liked most and experiencing positive effects of exercises were additional facilitators while a lack of self-discipline and feeling no need to practice were additional barriers.

Professional

Specifically during clerkships, a lack of autonomy, supervisors' negative opinion about mindfulness and high work pressure were mentioned as reasons for discontinuing mindfulness practice. Being able to select short exercises was a facilitator.

DISCUSSION

This qualitative study evaluated the nature and effects of mindfulness practice of clinical clerkship students 2 years after participation in an 8-week MBSR training. Three overarching themes as well as several possible facilitators and barriers for starting and maintaining mindfulness practice emerged, giving more insight in which factors contribute to the possible sustainable effects of mindfulness practice in the medical curriculum. The nature of students' long-term mindfulness practice varied from no practice at all to maintaining regular, mostly informal, practice. Core practice existed of focusing attention on bodily sensations or the environment during daily activities followed by enhanced awareness. In some interviewees this resulted in changed ways of coping like taking a pause, reflecting on the situation or recognizing automatic behavioral patterns, making space for a conscious response. Interviewees described both conscious *internal* responses such as taking distance (decentering) from negative thoughts, as well as *external* responses such as changing behavior toward a clerkship supervisor or patient. Overall, students' mindfulness practice and their changed ways of behavior or coping enhanced their enjoyment of daily activities, improved their work-life balance and sometimes influenced career choices by opting for other work setting or specialization.

The qualitative findings of the present study on the effect 2 years after a MBSR training in clinical clerkship students are in line with the scarce literature about long-term effects of mindfulness. A RCT in medical students demonstrated the viability of mindfulness training in promoting wellbeing and adaptive coping measured 6 years after the training (de Vibe et al., 2018). A mixed-method study in medical graduates, of whom over half of them indicated to still practice mindfulness up to 10 years after, showed similar results with lower self-reported stress, and better patient and personal connections (Staffaroni et al., 2017).

Importance of the Understanding of Mindfulness

Having a realistic understanding of mindfulness appeared to be a precondition for maintaining long-term mindfulness practice. This confirms previous findings in first-year medical

and psychology students shortly after MBSR; students with an instrumental approach of mindfulness experienced less benefits than those with a more comprehensive understanding (Solhaug et al., 2016).

Although in the current study not all students did develop a long-standing mindfulness practice, having participated in a training could in itself be valuable. Medical students with mindfulness experience have a greater knowledge of and are significantly more likely to administer or recommend it to others than students without exposure to mindfulness (Shapiro et al., 2006).

Attentional vs. Attitudinal Changes

In current literature, intention (purposefulness), attention (observing internal and external experiences) and attitude (the way one pays attention) are distinguished as three core aspects of mindfulness which are interwoven and occur simultaneously (Shapiro et al., 2006). In the present study, intentional and attentional aspects were clearly present, but changes in the way students pay attention (e.g., non-judging, compassionate) were rarely mentioned similar to findings of a study in first-year medical and psychology students (Solhaug et al., 2016). In contrast, in a qualitative study among Dutch medical residents 6 months after MBSR, "acceptance and non-judgment" was one of five central themes (Verweij et al., 2018). Physicians and other healthcare professionals also reported the cultivation of an increasingly open and self-compassionate attitude toward themselves (Irving et al., 2014).

In this study, the less profound attitudinal changes in students might be related to their younger age and lack of work experience. Students were invited to mindfulness training during the core curriculum without selection on distress level, which might have caused them to practice less. Compared to the residents and healthcare professionals who applied for the training themselves, they also might have had less understanding of mindfulness beforehand. Finally, many students only used the exercises they liked most, avoiding impatience and frustration, which might lead to less opportunities to cultivate attitudinal changes. Despite this, it is encouraging that although formal practice after 2 years is rare, students still reported many relevant benefits.

Strengths and Limitations

Strong aspects of the present study include the use of an unselected population of clerkship students of the original RCT (van Dijk et al., 2017) implying good external validity, and the use of the purposive sampling method for this qualitative study. The MBSR training was taught by qualified medical doctors which may have increased acceptability for the medical students and the standard protocol for MBSR was used. Furthermore, the current findings add to the existing literature, because of the focus on MBSR training in medical clerkship students instead of undergraduates and evaluation of long-term effects. None of the qualitative studies in the review of Crowther et al. evaluated effects of mindfulness in medical clerkships students (Crowther et al., 2020).

A possible limitation of the study was the difficulties some students mentioned in differentiating which changes of behavior

could be attributed to the MBSR training and which to their regular personal and professional development.

Implications for Practice

Considering the high levels of distress, depression and burnout in medical students and physicians (in training), which may adversely affect patient safety, the medical curriculum should provide tools for students to reduce stress and promote positive (mental) health. MBSR could be of particular benefit as highlighted in the present study giving students the opportunity to integrate mindfulness in daily life with possible positive effects on professional functioning.

A main barrier in starting and maintaining mindfulness practice seems the demanding clerkship schedule giving rise to the question what the right timing and format would be for offering medical students a mindfulness-based intervention. MBSR training shortly before the start of clerkships with follow-up meetings every month or two could be an alternative format. The follow-up meeting might support the long-term integration of mindfulness practice in their personal and professional life. Based on our results it seems valuable to actively explore students' understanding of mindfulness during the training to avoid unrealistic ideas or expectations. Examining attitudes of supervisors and other role-models could be important to prevent students from adapting to their environment and discontinuing mindfulness practice. Although little research has been done on teachers' perspective and influence, previous research revealed that students identify those who are not competent and specialized sufficiently (Crowther et al., 2020).

Recommendations for Further Research

A qualitative approach evaluating MBSR complements the mostly quantitative data available, therefore mixed method approaches should be considered in further research.

Although the themes found in the present study are in accordance with previous literature, a more in-depth insight in the development of compassion next to self-awareness through MBSR training may help to facilitate mindfulness practice in daily and professional life. It would be interesting to investigate the effects of compassion training on empathy and self-compassion, either as an additional explicit component in mindfulness-based interventions for medical students or as a stand-alone training following MBSR. Furthermore, in light of the mainly female cohorts investigated before, it would be worthwhile to explore how to make mindfulness more acceptable to students with a more diverse background both in terms of gender and other possible aspects such as cultural, socio-economic background and sexual identity. Customizing MBSR to the specific needs of the student population, like in the Mindfulness-Based Coping With University Life (Lynch et al., 2011), may increase mindfulness practice and may optimize its benefits.

CONCLUSION

Despite the busy clerkship schedule, the limited practice of students and the relatively short training period of 8 weeks,

many interviewees still engaged in some form of mindfulness practice 2 years after the training. Mindfulness practice strengthened students' focused attention and self-awareness, enabling changes in behavior and/or coping which could lead to improvements in personal and professional life. In light of the high clerkship demands, MBSR could be a valuable addition to the medical curriculum, supporting students in developing necessary competencies to become well-balanced professionals. Offering a training shortly before clerkships with regular booster sessions over a longer follow-up might better support students in maintaining a long-term practice.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

This study involving human participants was reviewed and approved by the medical ethical research committee, Arnhem-Nijmegen (Protocol registration nr. 2010/388 and ABR nr: NL33969.091.10). The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ID, AS, PL, and CW contributed to conception and design of the study. ID, MvB, and MAJ organized the database. ID performed the statistical analysis under supervision of AS, MvB, and MAJ and wrote the first draft of the manuscript. MvB and MAJ wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.785090/full#supplementary-material>

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Contribution of Academic Satisfaction Judgments to Subjective Well-Being

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The role of academic satisfaction (AS) on persistence and successful academic behavior has been the focus of research for decades. Nevertheless, driven by positive educational psychology, subjective well-being has been highlighted as another central feature in the academic path of students. Studies aimed at identifying the variables that contribute to explain different aspects of academic performance have been widely investigated, although studies aimed at identifying the determinants of subjective well-being are still limited. The present paper examined the contribution of AS judgments on subjective well-being (SWB). To this end, it was hypothesized that SWB levels depend on the balance between positive/negative emotions and life satisfaction judgments. Furthermore, it was stipulated that AS has an indirect contribution on SWB, through life satisfaction, whereas the balance of emotions influences both AS judgments and life satisfaction. Using an analysis strategy based on structural equation modeling, the results indicated that the model fitted satisfactorily, explaining 32% of the variance of SWB. Particularly, it was observed that AS judgments contributed to life satisfaction judgments ($\beta = 0.34$). Although no direct contribution of AS on SWB was reported, a total contribution partially mediated by life satisfaction judgments was revealed (total $\beta = 0.19$). These findings support the importance of academic satisfaction judgments, not only because of their importance in academic terms, but also because of their impact on university students' subjective well-being and health.

Keywords: subjective well-being, academic satisfaction, satisfaction judgments, university students, structural equation modeling

INTRODUCTION

Contribution of Academic Satisfaction Judgments to Subjective Well-Being

Positive education promotes the development of educational environments that allow students to learn an established educational curriculum, while acquiring the skills necessary to develop their own well-being and that of others (Oades et al., 2011; Riedel et al., 2020). This is a fundamental key point because the development of positive teaching practices and methods can contribute to achieving learning potential, developing positive attitudes toward higher education and skills for future employment of university students (Nilson, 2010; Eryilmaz, 2015).

The pursuit of happiness and achieving “a good life” are considered to be one among the elemental missions of psychology (Povedano-Diaz et al., 2020). However, the scientific study of well-being does not aim to prescribe what a good life entails, but to analyze the factors that lead people to positively evaluate their lives according to their own parameters. This evaluation is called “Subjective well-being” (SWB) and has been shown to be a phenomenon of importance for physical and mental health. Different research indicates that SWB is beneficial for health (Brummett et al., 2009; Segerstrom and Sephton, 2010) and longevity (Lyubomirsky et al., 2005; Howell et al., 2007; Chida and Steptoe, 2008). In addition, SWB is associated with supportive social relationships, citizenship, work performance, and resilience (Lyubomirsky et al., 2005; Diener and Chan, 2011).

SWB is a desirable goal for the society as a whole and in particular for adolescent and young adults (D’Agostino et al., 2019). During this distinctive stage, biological, psychological, cognitive and social changes can affect the levels of SWB, so this variable can be considered as an indicator of how they cope with these changes (Povedano-Diaz et al., 2020). SWB also works as a protective factor, people with higher SWB are more likely to develop health behaviors such as exercising, not smoking and drinking less alcohol (Diener et al., 2018). Also, higher levels of SWB are associated with the ability to form positive relationships, establish strong self-esteem, effectively express feelings and regulate emotions, persevere, and positively engage in challenging tasks (Shoshani and Slone, 2017; Bradshaw, 2019). Different studies also indicate that SWB is related to positive academic outcomes, and a better adaptation to the demands and characteristics of the university system (Casas, 2011; Fernandes Ferreira Lima and Araujo de Morais, 2018; Tomás et al., 2020).

Subjective Well-Being and Academic Satisfaction in University Students

The most popular model on SWB is the one proposed by Diener et al. (2018), which “includes people’s appraisals and evaluations of their own lives” (p. 1). This conceptualization differentiates, on the one hand, cognitive judgments such as those linked to life satisfaction and on the other hand, an emotional component which involves a balance between positive affect (pleasant and desirable feelings and moods) and negative affect (unpleasant and undesirable feelings and moods). In this model, the role of satisfaction judgments is key. According to Diener et al. (2018) when people reflect on their life, they make both general (considering the totality of their life) and specific judgments (they evaluate more specific domains such as satisfaction with studies, work or family). Goal satisfaction theory (Diener et al., 2018) assumes that the satisfaction of key needs, desires and goals will produce to high levels of SWB, and thus the dissatisfaction of them will produce to low levels of SWB. Various experimental and non-experimental studies indicate that vital satisfaction assessments are strongly associated with SWB indices (Schimmack, 2008) and changes in satisfaction assessments generate significant changes in SWB (Gamble and Gärling, 2012).

As proposed by Diener (1984, 1994) the general assessment of life satisfaction depends successively on the extent of satisfaction

within a group of specific domains. In addition, at different points in life, priorities and life circumstances change, and thus we will expect that the predictors of happiness can also change (Jebb et al., 2020). In this sense, it is expected that satisfaction with the academic experience constitutes a domain of great importance for people during their university studies (Lent, 2004).

Academic satisfaction (AS) is a high priority satisfaction domain in the lives of college students (Lent, 2004; Lent et al., 2017). Several studies sustain the importance of AS on well-being and life satisfaction (Garriott et al., 2015; Sheu et al., 2016). A review by Suldo et al. (2006) refers to a series of studies suggesting that students’ feelings and attitudes toward their university are significantly related to their level of life satisfaction. Likewise, studies developed within the framework of social cognitive career theory highlight the contribution of AS on overall life satisfaction, along with other relevant constructs such as self-efficacy beliefs and perception of social support (Lent et al., 2009, 2012; Ojeda et al., 2011; Sheu et al., 2017).

On the other hand, it is important to note that academic dissatisfaction can also be a source of subjective discomfort. During their formative years, university students are exposed to numerous academic demands, which can lead to stress, loss of confidence and demotivation. AS constitutes a protective factor against stress and helps students to cope more healthily with the challenges of academic life (Tessema et al., 2012; Lent et al., 2013; Kong and Yan, 2014). In contrast, it has been observed that students with low levels of AS present greater vulnerability to stress and lower academic performance, which negatively affects their well-being (Kuo et al., 2014).

It should also be noted that the conceptual delimitation of AS has not been without controversy. AS is often understood as a subjective and global cognitive assessment by students of their learning experience at university. AS judgments therefore derive from the comparison students make between their expectations and their perceived academic experience, the conformation of those assessments being supported by the knowledge available within the autobiographical memory (Bickart and Schwarz, 2001). As pointed out by Lent et al. (2007), there is a parallel conceptualization that understands AS as “the level of enjoyment that students perceive when carrying out experiences linked to their role as students” (p. 87). However, this definition is considered inadequate since positive affect would be a variable closely linked to, but different from satisfaction judgments. Positive affect influences the shaping of satisfaction judgments (Schoefer, 2008) and would also increase as a consequence of the favorable evaluation that people make (Tessema et al., 2012). This close link between positive affect and satisfaction judgments leads to the fact that they are often used interchangeably, when in fact they are associated but different variables. In the present study, AS is considered as a cognitive construct linked to, but distinct from, affect.

Despite the relevance of AS on student well-being, most of the studies conducted have focused on investigating the role of AS on academic behavior (e.g., academic performance and persistence). In fact, no SWB studies specifically addressing the contribution of AS to SWB were found within the literature. For this reason, the objective of this study was to evaluate the impact of academic

satisfaction on the SWB of university students. Specifically, and according to the model proposed by Diener, we hypothesized that: (a) levels of subjective well-being depend on life satisfaction judgments and the balance of positive/negative emotions; (b) domain-specific judgments (academic satisfaction) have a direct and indirect contribution, through life satisfaction, on SWB; and (c) the balance of emotions influences academic satisfaction and life satisfaction judgments (see **Figure 1**).

METHODOLOGY

Participants

The sample was constituted by 326 university students between 17 and 46 years old ($M = 21.76$; $SD = 1.61$), of both sexes (men = 38.7%; women = 61.3%). The participants were from public (68%) and private (32%) universities, distributed in the following careers: social sciences (48%), natural sciences (29%), technology (21%) and arts and humanities (2%). The sampling was non-probabilistic and accidental. That is, the possibility of participation was limited to those students who were on the university campus and gave their consent. In addition, as this was a cross-sectional study, no dropouts were recorded.

Instruments

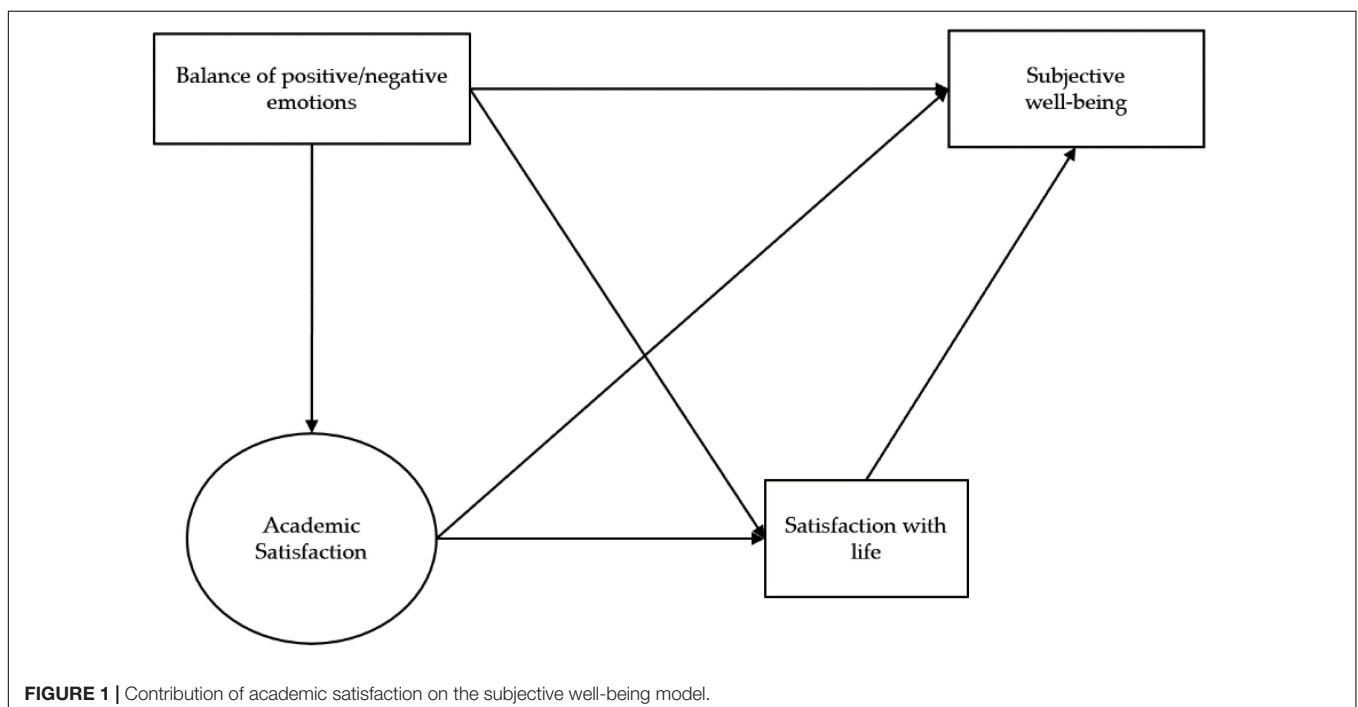
Subjective Well-Being

To measure this variable, Subjective Happiness Scale (SHS; Lyubomirsky and Lepper, 1999) was used. In order to achieve a measure of overall “Subjective Well-being,” Lyubomirsky and Lepper (1999) have designed the SHS to measure the levels of Well-being in a comprehensive and global sense. This measure is a subjective assessment of whether a person is happy or unhappy.

This is a 4-item scale, two of the items ask participants to characterize themselves in terms of statements such as “*in general I consider myself. . .*” on a 7-point Likert scale, where 1 is *not very happy* and 7 is *very happy*. The other two items provide a brief description of happy and unhappy individuals and ask participants to say the extent to which they identify with each description, for example “*some people are very happy in general and enjoy life come what may, exploiting life to the full. To what extent does this characterization describe you?*” where 1 is *not at all* and 7 is *to a large extent*. Vera-Villaruel et al. (2011) reported studies on psychometric properties with adequate internal factor structure and consistency (α values between 0.73 and 0.87) for populations of adults, adolescents and university students; r -values obtained for depression and neuroticism scales in studies of discriminant validity were between -0.24 and -0.63 and significant positive correlations with measures of optimism and extroversion between 0.27 and 0.55. It should be noted that in this context the concepts of subjective happiness and well-being are equivalent (Lyubomirsky and Lepper, 1999).

Positive and Negative Affect Scale

This is a 20-item scale in which 10 items evaluate states of positive affect (for example “active,” “strong,” “inspired”) and the remaining 10, states of negative affect (such as “guilty,” “scared,” “hostile”; Watson et al., 1988). Participants were asked to indicate on a 5-point Likert scale the extent to which they experience each one of the mentioned affective states, 1 signifying *very seldom or never* and 5 *very frequently or almost always*. In his original version, Watson et al. (1988) reported studies with an internal consistency of between 0.86 and 0.90 for Positive Affect and between 0.84 and 0.87 for Negative Affect. In a study adapted to Argentina, Medrano et al. (2015) were able to replicate



the structure of two factors and indicated acceptable indices of internal consistency ($\alpha = 0.83$ for Negative Affect and $\alpha = 0.82$ for Positive Affect).

Satisfaction With Life Scale

This 5-item scale investigates the level of satisfaction with situations related to life in general Diener et al. (1985); participants respond on a 7-point Likert scale where 1 is *completely disagree* and 7 is *entirely agree*. Diener et al. (1985) reported satisfactory internal structure, test-retest reliability and internal consistency (Cronbach's $\alpha = 0.87$) for the scale's psychometric properties. For the present study the version translated into Spanish by Gómez et al. (2007) was used, in which there are 5 response options, with 1 representing total disagreement and 5 total agreement. For the psychometric properties the Spanish version showed adequate values for internal consistency (Cronbach's $\alpha = 0.84$), internal structure (exploratory factor analysis) and convergent-discriminant validity (Atienza et al., 2000).

Academic Satisfaction

Since the basic aim of the current paper was to evaluate the contribution of AS to the model of SWB, it was decided to treat the former as a latent variable in order to arrive at a more concise measurement. Structural equation modeling (SEM) allows for the simultaneous use of several variables for a theoretical, unobservable construct, which ultimately leads to more valid conclusions on the construct level, helping to reduce measurement error. In the present study we applied three different AS scales. The first, AS1, is the scale developed by Lent et al. (2007) comprising 7 items in which respondents must evaluate their level of satisfaction with different aspects of their academic experience (for instance, "*I enjoy my classes most of the time*"). Respondents are asked to indicate the extent to which they agree to each statement on a 10-point Likert scale. The original psychometric studies suggested that the scale has a unidimensional factor structure and high internal consistency (Cronbach's $\alpha = 0.94$). The version adapted by Medrano et al. (2014) was used, in which the internal structure and internal consistency structures are satisfactory ($\alpha = 0.85$). The second tool (AS2) is the scale developed by Fernandes Sisto et al. (2008) comprising 11 items (statements such as "*I like the classes*") to be rated on a 4-point Likert scale where 1 is *never* and 4 *always*. For the purpose of the present study, the version adapted by Medrano and Pérez (2010) was used. The psychometric results corroborated the unidimensional structure of the scale *via* exploratory factor analysis and its internal consistency (Cronbach's $\alpha = 0.84$). The third instrument, AS3, is the global index of academic satisfaction (Argyle, 1987). This scale consists of a single item assessing academic satisfaction *via* a graphic representation of responses on a visual scale of 10 positions. Students were asked to respond on a scale of 1–10 to the item "*based on how you feel about your studies, indicate where you would place yourself on the following diagram?*" where 1 is "*the worst learning experience I could ever have*" and 10 is "*the best learning experience I could ever have*."

Procedure

After providing clear and explicit information to the university authorities concerning the nature and purpose of the study, questionnaires were delivered collectively during class under the supervision of the authors of the paper. The voluntary nature of participation was emphasized and the confidentiality of the data assured, stating clearly that the results would be used exclusively for research purposes and that the identity of the individual participants would remain confidential. Each participating student signed a consent form. The following questionnaires were then handed out over the next 12 min: Subjective Happiness (Lyubomirsky and Lepper, 1999), Positive and Negative Affect Scale (PANAS; Watson et al., 1988), Satisfaction With Life Scale (SWLS; Diener et al., 1985) and the three measures of Academic Satisfaction (Argyle, 1987; Lent et al., 2007; Fernandes Sisto et al., 2008).

SEM was used to examine the relationships among variables. The main advantage of the SEM technique is that it allows for a more precise analysis of empirical data by taking into account latent variables and complex patterns of relationships between variables.

RESULTS

Initial Descriptive and Exploratory Analysis of the Data

Atypical univariate cases were identified by calculating the Z ratings for each variable ($Z > \pm 3.29$ were considered atypical) and multivariate cases by means of the Mahalanobis distance ($p < 0.001$; Tabachnick and Fidell, 2013). Twenty two atypical univariate cases were observed and 19 multivariate. Although atypical cases tend to distort the results it was decided to include them in the analysis since otherwise the data would fail to represent a segment of the population (Hair et al., 1999). The mean, standard deviation, asymmetry and kurtosis were calculated. Values between ± 1.00 were considered excellent for evaluating the asymmetry and kurtosis indices and values lower than ± 2.00 were considered adequate (George and Mallery, 2016). All asymmetry and kurtosis variables presented values between ± 1.00 with the exception of General Satisfaction, which showed an adequate level of asymmetry $R (-1.11)$, higher than the kurtosis range (2.40; see **Table 1**). Multivariate normality was verified by Mardia's coefficient (Mardia, 1970, 1974), giving a value of 12.06, which is below the critical value of 70 suggested by Rodríguez Ayán and Ruiz (2008) and thus approaches the standard normal distribution. The association between the different variables was verified using Pearson's r correlation coefficient. All correlations were statistically significant with weak to moderate r -values, thus discarding any overlap between the variables (Tabachnick and Fidell, 2013; see **Table 2**).

Evaluation of the Subjective Well-Being Model

The statistical software Mplus 6.12. was used to assess goodness of fit using the maximum likelihood estimator (ML), applying the

TABLE 1 | Descriptive statistics for mean and standard deviation, asymmetry and kurtosis of the variables comprising the subjective well-being model.

	Mean deviation	Standard deviation	Asymmetry	Kurtosis
Balance of positive/negative emotions	9.09	9.76	-0.31	-0.18
Satisfaction with life	18.67	3.39	-0.36	-0.39
Subjective well-being	20.64	3.65	-0.45	0.00
Academic satisfaction 1	52.01	9.23	-0.96	1.55
Academic satisfaction 2	54.81	11.86	-0.74	0.92
Academic satisfaction 3	7.68	1.39	-1.11	2.40

TABLE 2 | Bivariate correlations between the variables comprising the subjective well-being model.

	1	2	3	4	5	6
1. Balance of positive/negative emotions	1	0.34**	0.33**	0.24**	0.17**	0.34**
2. Satisfaction with life		1	0.54**	0.38**	0.26**	0.39**
3. Subjective well-being			1	0.24**	0.17**	0.29**
4. Academic satisfaction 1				1	0.77**	0.62**
5. Academic satisfaction 2					1	0.56**
6. Academic satisfaction 3						1

** $p < 0.01$.

following statistical tools to measure the fit of the model: Chi-squared, Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). CFI and TLI indices with values between ≥ 0.90 and 0.95 or higher are considered an acceptable to excellent fit and values of < 0.08 are expected for RMSEA and < 0.06 for SRMR (Hu and Bentler, 1999; Yu and Muthén, 2002). The results indicated a satisfactory fit ($\chi^2 = 9.176$; $df = 5$; $p = 0.000$; CFI = 0.99; TLI = 0.98; RMSEA = 0.05, [90% CI = 0.00, 0.10], SRMR = 0.020), explaining 32% of the subjective well-being variance.

Direct contributions of satisfaction with life ($\beta = 0.48$, $p < 0.01$) and positive/negative emotions ($\beta = 0.17$, $p < 0.01$) were observed. On the contrary, the relationship between academic satisfaction and subjective well-being was not corroborated ($\beta = 0.03$, $p > 0.05$). In order to adequately understand how one variable relates to another, indirect effects, understood as the product of the two standardized direct effects involved, must also be considered. By examining these effects it is verified that satisfaction with life modulates the relationship between positive/negative emotions and subjective well-being (indirect effect, $\beta = 0.17$, $p < 0.01$). Similar behavior was evident with respect to the contribution of academic satisfaction and subjective well-being through satisfaction with life (indirect effect, $\beta = 0.16$, $p < 0.01$). When examining the magnitude of the total effects (see **Table 3**), it can be seen that the variables that have the greatest contribution to subjective well-being are positive and negative emotions (β total = 0.34), and academic satisfaction (β total = 0.19, see **Figure 2**).

TABLE 3 | Total effects, direct and indirect, of the subjective well-being model.

Model variables	Effect		
	Direct	Indirect	Total
Balance of positive/negative emotions			
On academic satisfaction	0.27**	–	0.27**
On satisfaction with life	0.25**	0.09**	0.34**
On subjective well-being	0.17**	0.17**	0.34**
Academic satisfaction			
On satisfaction with life	0.34**	–	0.34**
On subjective well-being	0.03**	0.16**	0.19**

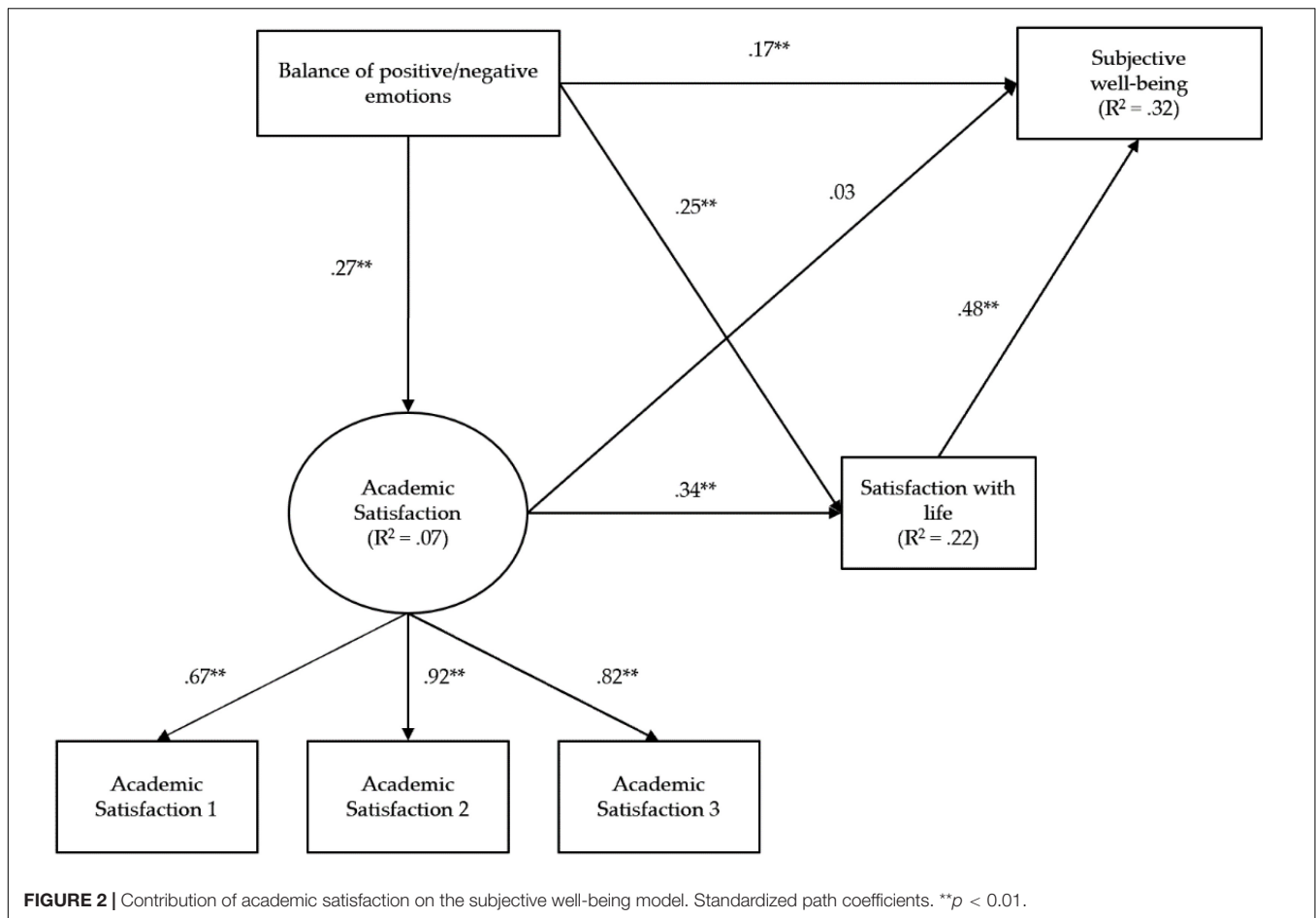
** $p < 0.01$.

DISCUSSION

Many universities are focused on the students' performance, specifically in terms of good grades, without paying enough attention to other relevant aspects that should be part of the overall personal development (Tomás et al., 2020). According to Diener (1994), levels of well-being depend partially on the degree of satisfaction with different life domains (Argyle, 1992, 1994; Diener et al., 1999; Diener, 2000). The importance of each domain varies in accordance with its proximity and immediacy in a person's life. AS judgments could thus be an important determinant of the level of well-being of university students; however, current scientific research has been centered on factors associated with academic performance and the specific contribution of AS has not been analyzed (Smith et al., 2003). Academic performance is of course a relevant construct, but high performing students with low SWB present lower levels of well-being (Lent et al., 2009; Tessema et al., 2012; Balkis, 2013; Kuo et al., 2014). This lack of studies taking into account the effect of academic satisfaction on mental health therefore led us to evaluate its contribution in the subjective well-being model proposed by Diener (1994) as applied to a sample of university students in Cordoba, Argentina.

Our findings corroborate the importance of AS judgments in well-being; it was observed that the greater the academic satisfaction, the more likely this was to favorably impact on students' satisfaction with life in general. No direct and significant influence of satisfaction assessments on well-being was observed, possibly due to the effect of moderators such as age or the introductory/strictly theoretical nature of some subjects, which could bias satisfaction levels. Future studies should therefore control for these variables. Nonetheless it was observed that the total effect was slightly higher than the direct contribution of positive and negative emotions on well-being. These results are consistent with those reported in the literature. In a recent study, Lee and Shin (2022) evaluated a cross-cultural model of academic and life satisfaction, highlighting the contribution of positive affect on AS and the contribution of these constructs on life satisfaction.

In the context of efforts to promote the health and optimal academic behavior of students, Durkin and Joseph (2009) point out the crucial importance of looking more closely into the



factors that promote well-being. Intervention strategies based on the theoretical framework of Lent's Social Cognitive Career Theory (Lent, 2004) would contribute toward explaining how students develop these satisfaction judgments. For example, Lent (2004) reports that in self-efficacy beliefs about one's ability to perform well, having positive outcome expectations and feeling supported, tend to affect academic satisfaction judgments. Measures to endorse self-efficacy beliefs should therefore be centered on incrementing the capacities involved: establishing and advancing toward a set of performance goals for each stage of academic study, predicting favorable results and perceiving the environment to be supportive.

As mentioned by Diener (1994, 2000) and Lent (2004) and in congruence with the triadic model (taking into account personal, behavioral and environmental factors) proposed by Bandura (1987), the findings of the present study underscore the fact that AS judgments not only affect the academic domain but also have an impact on satisfaction with life and indirectly, on well-being. These results highlight the importance of providing experiences that promote changes in AS. In the literature related to SCCT, it is observed that the most important promoter of satisfaction judgments is self-efficacy beliefs. Different studies (e.g., Wang et al., 2004; Tschannen-Moran and McMaster, 2009) point out the importance of focusing on the sources of

information (mastery experience, social persuasion, vicarious learning, and physiological/emotional states), which contribute to such beliefs (Bandura, 1987). In this sense, Lam and Santos (2018) developed an intervention program aimed at modifying self-efficacy beliefs through the identification of appropriate models, anxiety management, recording of negative/destructive thoughts, small group discussions, consultations with the tutor and individual assignments (workbooks), among other aspects. This line of action, added to the recommendations made by Brown and Krane (2000) to modify such sources could be used as a focus to increase beliefs and, therefore, satisfaction judgments.

Regarding positive and negative emotions, the present study observed that students with positive emotions tend to be more satisfied with their lives, inducing a higher level of well-being. The literature linked to positive psychology highlights different intervention practices aimed at increasing positive affect (Sin and Lyubomirsky, 2009). For example, daily recording of gratitude (Emmons and McCullough, 2003; Froh et al., 2008) and recounting one's own acts of kindness (Otake et al., 2006) has been associated with higher levels of positive affect, life satisfaction, and a decrease in negative affect. Similarly, Seligman et al. (2005) have shown that writing down three good things that went well each day and using the top strengths in a novel way each day for a

week, increases well-being and decreases depressive symptoms. As mentioned by Fredrickson (2001) generating practices linked to positive emotions contributes to optimal functioning by increasing the thought-action repertoire, psychological resilience, and emotional well-being, thus minimizing persistent negative emotions.

Another modality of intervention lies in mindfulness practice. Burke (2014) argues that negative affect can be reduced as reactivity is reduced, as a consequence of adopting a non-judgmental perspective on internal experiences; whereas positive affect can increase as a consequence of engaging in the full experience of life, relating to oneself and third parties in a self-compassionate manner. On this point, there are intervention models based on the Mindfulness-Based Stress Reduction (MBSR) paradigm adapted to educational contexts (see Broderick and Metz, 2009; Santorelli and Kabat-Zinn, 2009; Kaiser-Greenland, 2010; Semple and Lee, 2011, for examples), which have evidenced satisfactory results. As indicated by Diener et al. (2018) the different practices aimed at modifying SWB are characterized by persistent effects during moderate times and the effects of their effectiveness may vary depending on the practice performed by individuals. Based on these results, the development of intervention programs should be incorporated into the educational curriculum to be sustainable over time.

As for the limitations of the study, it should be noted that the sample is somewhat small, with a higher proportion of women, and the distribution of students in the different areas of knowledge is not homogeneous, with a greater representation of social sciences. These aspects should be considered for the generalization of the results. However, the review of the literature and, particularly, the theoretical foundations that support the relationships between the variables, suggest the suitability of the model and similar results can be found if the indicated limitations are overcome.

Despite the previous points, suggestions for future lines of research stand out. First, the construct of positive and negative affect could be complemented with an evaluation of the intensity and frequency of these emotions (Diener et al., 1985) to analyze the differential role of these variants. Second, as mentioned in several studies (Argyle, 1992, 1994; Diener et al., 1999; Diener, 2000), the particular circumstances of each student's

life, e.g., family, friends and social relationships, should be assessed to increase the explanatory power of the well-being model. Thirdly, in recent years, the presence of integrative models has been observed in the educational literature, which allow the combination between them, allowing the evaluation of multiple dimensions of educational behavior (Lent et al., 2013). In this sense, a line of action could include the constructs of positive emotions, engagement, relationships, meaning and accomplishment (PERMA) proposed by Seligman (2011) to assess well-being, to the proposed model with the aim of analyzing the interplay between the variables under study. As mentioned by Lee and Shin (2022) and, fourthly, empirical studies of a longitudinal nature are still limited compared to cross-sectional studies. This situation does not allow us to inspect both the temporal prevalence of the constructs and the possible bidirectional relationships. Therefore, longitudinal studies are needed to analyze these aspects. Finally, as a result of the development of these lines of action, it is necessary to carry out intervention programs through the development of practices and/or teaching methods, with the aim of contributing to positive education.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Comité Académico de ética en Investigación de la Facultad de Psicología (Universidad Nacional de Córdoba). The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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