TEACHER ATTITUDES TOWARD PERSONALIZED LEARNING PLANS

by

Micah Hayre

Liberty University

A Dissertation Present in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

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ABSTRACT

The aim of this research was to analyze Vermont K-8 teachers' attitudes toward student personalized learning plans with respect to the independent variable of years of personalized learning plans implementation. This was an important study because personalization has become the new trend in Vermont education. The purpose of this study was to bridge a gap in the literature and research surrounding teacher attitudes toward personalized learning plan implementation. Personalized learning plans were being used as a pathway to high school graduation. Determining the attitudes of teachers toward this initiative seemed reasonable given the upswing of this recent trend in education. Over 150 Vermont teachers participated in this study, ranging geographically over more than twenty supervisory unions. The teachers range in personalized learning plans implementation of one year of experience to five or more years of experience. The Personalized Learning Environment Attitude Scale (PLEAS) instrument was used to collect the data. The voluntary teachers were given a link to the 27-question, five-minute online survey. A causal-comparative research design was used in this study with the one-way between-subjects analysis of variance (ANOVA) as the tool of analysis. There was no statistical significance found; rather, the study found largely favorable attitudes toward personalized learning plans. It is recommended that more research be conducted around the effectiveness of personalized learning plans and the solicitation of teacher input of such research.

Keywords: personalized learning plans, personalization, supervisory unions, attitude scale, flexible pathways to learning, causal-comparative, ex post facto

Dedication

This dissertation is dedicated first and foremost to our gracious Heavenly Father. He gives me more than I deserve. Second, I dedicate this dissertation to my wife, Danielle, who was by my side every step of the way. Without her love, support, and encouragement, this would have been an impossible task.

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I would like to thank the countless people who have prayed for me during this journey. God heard them and He saw them through. I would never have been able to complete this dissertation at this stage in my life without the love, support, and patience of my children, Jaydan and Jethro. I hope we can get back the many missed moments. Love you kiddos. Thank you to my wife, Danielle, who went above and beyond during these years to make sure I could see this through. I love you more than words could express!

Most important, I give all the glory to God who allowed me to take this journey and helped me from the beginning until the end.

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Analysis of Variance (ANOVA)

Guided Discovery Learning (GDL)

Individuals with Disabilities Education Act (IDEA)

Individual Education Plan (IEP)

Institutional Review Board (IRB)

Kindergarten through Eighth Grade (K-8)

Kaiser-Meyer-Olkin (test) (KMO)

Personalized Learning Environment Attitude Scale (PLEAS)

Personalized Learning Plans (PLP)

Personalized Learning Environment Questionnaire (PLQ)

State Board of Education (SBE)

Statistical Package for Social Sciences (SPSS)

Vermont (VT)

CHAPTER ONE: INTRODUCTION

Overview

In the first chapter of this dissertation, the researcher presents the background of the research study, where the purpose was to determine the overall attitudes of Vermont K-8 teachers toward personalized learning plans. The study compared teachers with one, two, three, four, and five or more years of experience with personalized learning plans. The first considerations were the terms *personalization* and *personalized learning* as they are used in the educational field. The next consideration was the impact that personalization has on the educational community. Also discussed in this first chapter, are the problem statement, the purpose of the study, the significance of the study, and the research question.

Background

John Dewey once said, "What the best and wisest parent wants for his child, that we must want for all of the children of the community" (Murphy et al., 2016, p. i). The emergence and popularity of the word *personal*, not only in global educational communities, but all areas of life (grocery shopping, athleticism and exercise, technology), has led to a renewed focus on individuals as being central to service-based industries. In education, it draws attention to the individual student, painting a picture of unique talents, knowledge, and needs in and out of the classroom.

The educational term *personalization* or *personalized learning* has been used for a number of decades. It has been defined in many different ways. Many sources, like Basye (2018), felt that the term personalized learning was a way to sell greater numbers of technological devices and programs geared toward individualized instruction for students, but really failed to meet student learning needs. Personalization originated as "an alternative to so-

called ‘one-size-fits-all’ approaches to schooling in which teachers may, for example, provide all students in a given course with the same type of instruction, the same assignments, and the same assessments with little variation or modification from student to student” (Hidden Curriculum, 2014, p. 1). Since personalization is greatly concerned with student needs, student goals, and student interests, it is nearly interchangeable with student-centered learning. Student-centered learning strives to engage the student in the classroom by involving them in the planning, or selecting, and implementation of material (McCarthy, 2015). Providing students with a buy-in, successfully getting them to invest in their learning, can create an environment of shared power and voice leading to greater engagement, higher level learning, and comprehension.

As aforementioned, personalized learning has been around for quite some time. Many professionals in education have determined the importance in individualizing student pace. Preston Search, the superintendent of schools in Pueblo, Colorado established the Pueblo Plan allowing students to move at their individual pace in 1889; however, it did not circulate, perhaps because of the lack of high-quality widely used learning materials (Ventura, 2014). The San Francisco Normal School, in 1912, allowed students to move to the next grade’s material once demonstrating excellence and understanding in the subject (Ventura, 2014). In 1916, John Dewey encouraged student-centered education by having students engage with the material while maintaining teacher support (Ventura, 2014). In 1990, the United States Congress passed the Individuals with Disabilities Education Act (IDEA) that required every child with a disability to have an Individual Education Plan (IEP) considering their individual needs, their goals, and their academic success with proper support (Ventura, 2014).

This idea has continued developing and remains in place, with a variety of new technological and highly advanced tools for utilization toward the goal of individualized learning

plans. Technology has continued to play an integral role in the development of personalized learning for students, yet it is more than merely using technology. Personalization is used appropriately when used towards the goal of helping students achieve their goals, engaging their learning, considering their interests and their dreams, enabling them to set goals, and making a plan to meet them. In the classroom, personalization means the teacher must place student needs first, using a variety of teaching methods, meeting each student's unique learning styles, with ample support from staff, administration, and colleagues. Personalization presents itself in a multitude of ways and can be dependent upon the school and district vision and mission. Sometimes personalization is accomplished through different

> learning pathways, dual-enrollment experiences, personal learning plans, portfolios, advisories, and mentorships, alternative educational approaches and instructional methods—such as authentic learning, blended learning, community-based learning, or project-based learning, and fostering student voice…as an alternative to more traditional forms of instruction in which teachers may make unilateral decisions with little or no input from students. (Hidden Curriculum, 2014, p. 1)

Authentic learning may be evident with approaches like personalized learning plans.

The International Society for Technology in Education (Basye, 2018) has also contributed a paraphrased definition of personalized learning: individually paced instruction to meet learner needs, based on individual learning styles and interests, in a personalized learning environment, built on varied learning objectives and specific content, on behalf of the prime stakeholders, teachers, students, and technology. With the shift from traditional education and direct instruction, relationships must evolve between students and educators. "Educators take on new roles as mentors, coaches and facilitators, and power and control shifts to the students. By

giving students ownership over their learning and grounding learning in their interests and passions, they feel valued, motivated and in control" (Abel, 2016, p. 2). Where there is a lack of personalization, of individualized instruction, there is likely a gap in student success and learning, as students are not able to vocalize their needs and interests, or experience their learning and achieve success, even in areas of weakness. Patrick et al. (2013) wrote,

> To personalize learning is to encourage students to develop clear goals and expectations for achievement and support them to make good decisions in a challenging and rigorous learning environment. It is a space where teachers are allowed the time they need to work with students; design instruction that is rigorous, flexible, and adaptable; and focus on critical thinking and metacognitive practices to develop stronger, deeper, independent learning. (p. 6)

The instruction should be driven by the students; it is their learning that is affected.

Implementing personalization in the classroom requires that the teachers and students understand their preferred learning styles and how that will impact their teaching/learning relationship. An effective teacher must meet each student's needs using a variety of learning tools and modalities. One research team has stated, "Studies show that students tend to have better performances when the content is customized according to his/her preferences. One important aspect of students' particularities is how they prefer to learn" (Dorca et al., 2015, p. 45). This is another case of student-centered learning; students are likely to be engaged when their interests are piqued.

Personalized learning impacts the overall educational community. Teachers, in order to facilitate student-centered learning, must receive effective professional development demonstrating a variety of models and manipulatives, programs, and tools. For the professional

development to be effective, the administration and those providing for teacher-continued learning must be current in their research and understanding of personalized learning. "Effective professional development caters to what teachers think will help them become more effective" (McCarthy, 2015, p. 1). McCarthy (2015) wrote that for professional development to be labelled as successful, teachers must feel that they left the session with "skills and strategies that can be used immediately to impact instruction and work-related responsibilities" (p. 2). Proper training and development of teachers means enabling them to make the shift between direct-instruction and student-led instruction, engaging the teacher to the point of being *comfortable* with "changing their leadership style from directive to consultative" and co-developing a plan with the students to meet their needs (McCarthy, 2015, p. 2). When the leadership is comfortable with guiding and instructing teachers on developing personalized student learning plans, teachers will become comfortable. When the teacher is comfortable and fluent with student-centered learning, then the students will be eager to engage in the classroom. If any one of these elements is missing, then the overall educational environment is negatively impacted, even thrust into chaos, with no one certain who is guiding the instruction.

Personalization has taken a position on the forefront of educational reform to create classrooms that engage students on emotional, cognitive, and behavioral levels, "tightening connections between students and their learning environments (e.g., teachers, other adults, student peers, curriculum, overall school culture)" (McClure et al., 2010, p. 3), and connecting students to their learning, to their peers and teachers, encourages their commitment to achievement and striving toward success.

Building teacher-learner connections with educators acting as guides and coaches, ensures that students are not overlooked or lost in the classroom. To develop personalized

learning environments, it is evident that there are many different ways to build connections between teachers and students, and therefore, instruction and learning. Connections are vital, but possibly more so is teacher confidence. It is not enough to personalize student-learning with student buy-in; teachers must also receive personalized instruction and buy-in. Personalizing professional development for teachers means considering their knowledge and experiences, co-developing a plan to meet professional goals, and fully engaging them in effective collaborative and shared learning experiences. McCarthy (2015) wrote, "Confidence rises as they understand how their existing expertise fits into the new concepts being taught" (p. 3). There is a clear correlation between professional development and teacher confidence.

One theorist, Malcolm Knowles, postulated that adults can learn following a specific set of principles and assumptions. Knowles theorized that "adults need to be involved in the planning and evaluation of their instruction, experience (including mistakes) provides the basis for the learning activities, adults are most interested in learning subjects that have immediate relevance and impact to their job or personal life, and adult learning is problem-centered rather than content-oriented" (Pappas, 2013, p. 2). Knowles' theory emphasized the tenets of personalization focusing on problem-centered learning with activities chosen in relation to their interests and experiences. McDonough (2014) suggested that individualizing the adult learners' curriculum causes the adult learner to become actively engaged in their learning. Professional development instructors are more successful when they link teachers' learning to their own lives and experiences. Professional development regarding personalization of student learning is even better served when that learning is personalized for teachers. McDonough (2014) wrote, "Actively engaged adult learners are more likely to approach tasks eagerly and to persist in the face of difficulty" (p. 12). For meaningful learning to take place in professional development for

teachers, they must be actively engaged, intrinsically motivated, focused, involved in collaborative learning, challenging academic activities, and have their personal experiences seen as valuable and useful in their continued learning and implementation of personalization strategies in the classroom (McDonough, 2014). Based on Knowles' theory of adult learning, instructors for teacher professional development need to emphasize the *why* of their learning and ensure that teachers can perform what they are learning for maximum understanding for the benefit of immediate implementation (TEAL Center Staff, 2011).

Problem Statement

Personalization is an increasingly popular trend in education today. One article relating to specific recommendations and event-related analysis stated, "Learning is considered personalized if it is tailored to each learner's strengths, needs, and interests, encouraging flexibility in a student's pursuit of mastery and enabling learners to take an active role in what, when, where, and how they learn" (Dieter, 2020, p. 736). Further stating, "personalized learning approaches also hold the promise of helping students achieve mastery as efficiently as possible, and can facilitate educators' work in guiding students' learning efforts towards educational activities that best match their current needs" (Dieter, 2020, p. 736). Unfortunately, the research does not lend itself one way or another. Modern research claims the need for personalized learning plans, yet there is little to no supporting evidence thereof.

There is a wealth of technology available to aid in personalizing learning for students, as evidenced in one article assessing the use of Lexia Core5 technology in grades K-5. Considering the event-related recommendations for usage and skill levels, the researchers determined "Individualized usage time recommendations do not appear to be common in most, learning technologies; many continue to provide one-size-fits all usage recommendations," (Dieter, 2020,

p. 736). This then begs the question: how personalized is it? The author then suggested "Despite the recognition of learning scaffolds as critical and effective for self-regulation in general and in computer-based learning environments in particular, relatively little research has been done into the impacts of recommendations" (Dieter, 2020, p. 736). There are many articles detailing the tools for personalization and their effectiveness. If one was merely trying to decide which tool to use or what mode of technology, decisions could be made using available research.

However, there have not been enough studies and experiments conducted to show a correlation between personalized learning and student achievement and there are even fewer studies that target teacher attitudes. Some research considers student attitudes, but mostly focuses on students at the university level. Sahin (2014), the same creator of the PLEAS survey used by this researcher, looked at university students' attitudes toward personalized learning environments. Yet, no studies have looked at the attitudes of the teachers with experience in implementing personalized learning plans. Because of this particular gap in the literature, this study looked at teacher attitudes toward the personalized learning plan implementation.

Teachers are being trained on the theory and implementation of personalization, yet, it is apparent that the training is not being implemented with fidelity, which impacts the Vermont school districts. Additionally, there is an argument that personalization is not the answer to raising test scores, and yet some teachers are evaluated on standardized test results. One must wonder if personalization is the focus if test scores are not showing improvement, or if changes should be made to teacher evaluations. There must be a formalized curriculum that is rolled out to all schools, allowing teachers the opportunity to lend perspective toward the process and effectiveness. Then, in order to evaluate the implementation process, it is important to measure teacher attitudes with varying years of experience of training. The problem is that the attitudes

of those with actual implementation experience have not been addressed and their feedback has not been sought after.

Purpose Statement

The purpose of this study is to see if teachers' attitudes change with years of personalized learning plan implementation experience, perhaps increasing, decreasing, or staying steady with one to five or more years of experience. If teachers do not maintain a favorable outcome towards a new educational promotion, then teachers will not implement the practice with fidelity and enthusiasm. It is important to make sure teachers gain momentum with new practices. If states are not aware of the teacher attitudes, then they will not know how to adapt the implementation process. With any new process, data should be collected, evaluated, and revised if needed. Data have not been collected on whether or not teachers in Vermont hold favorable attitudes toward personalized learning plans. If they are favorable, then no change is needed. But, if they are not favorable from year one and following, then states must revisit the implementation process. Teachers throughout the state of Vermont will have the opportunity to share their attitudes toward the implementation process of personalized learning plans.

A causal-comparative research design was used in this study. The research question sought to determine a relationship between the two variables: attitudes (dependent) and personalized learning plan teacher experience among teachers with one, two, three, four, and five or more years of experience (the independent variables). This research method was quantitative in nature. The researcher surveyed 150 K-8 schoolteachers who were in the personalized learning plans implementation process. This was both for convenience and purposive sampling, as the participants were chosen based on both availability and willingness. However, the participants were also K-8 teachers with personalized learning plan implementation experience.

Significance of the Study

Education reform has been on the forefront of conversation and one increasingly popular idea is personalized learning; it promises to "address the disengagement of today's students and to be proactive in closing the growing achievement gaps occurring in far too many schools" (Hughey, 2020, p. 1). Student engagement has become a greater focus in the classroom, "building on their interests, aptitudes, and strengths, thus creating intrinsic motivation for achievement and success" and empowering them as they become involved in goal-setting and decision-making about their own learning (Hughey, 2020, p. 2). For educators, Hughey (2020) suggested that "Educators need to be preparing students for jobs not yet in existence" based on changes in the economy and the types of tasks the world needs, purporting a greater need for social emotional skills, leadership, willingness to take initiative, cognitive skills, creativity, and problem-solving abilities (p. 2).

An element of concern then, is on the ability for teachers to meet those growing needs by providing the students with resources and educational experiences that will prepare them for the future. The role of the educator in the classroom changes, but in all actuality, becomes less defined in the shift toward personalized learning. Even the personalization tools mainly rest on how effective a teacher is in utilizing it. Boninger (2019) assessed three up-and-coming online platforms, especially used and advertised during the online learning incursion during the COVID-19 pandemic: Nearpod, Canvas, and Pearson Schoolnet. Each time the assessment remained the same regarding teacher-dependence: "Personalization is fully dependent on how the teacher uses the product" (Boninger, 2019, p. 40). On the one hand, "Educators feel a sense of empowerment when given control over their goals and activities", especially as it relates to implementation in their classrooms for the benefit of their students (Hughey, 2020, p. 5). On the

other hand, the amount of control an educator has leads to questions about fidelity and efficacy in each classroom. Where are the safeguards for offering equitable educational learning experiences to every student? How effective will professional development be if it is impossible to be comprehensive given the multitude of avenues available to the educator?

One researcher wrote, "Despite many red flags, pressure to adopt personalized learning programs keeps mounting. States continue to adopt policies that promote implementation of digital instructional materials but that do little to provide for oversight or accountability" (Boninger, 2019, p. 3). She addressed the popularity, attractiveness, and enthusiasm surrounding personalized learning, and yet failure to consider any of the problems behind the programs. She draws attention to the ineffectiveness of the cost and corporate profiteering off of an educator's desire to do what is best for the students. With the rise in online learning, the Gates Foundation and Google are among those seeking to commercialize the personalization industry online. Boninger (2019) wrote, "The disappointing experience of educators who in the past few decades were attracted to the promise of charter schools is telling: well-funded and powerful for-profit corporate interests now dominate charter school reform. The probability is high that well-funded and powerful for-profit interests will overtake personalized learning as well" (p. 7). Where is the promise for accuracy, accountability, and efficacy if the motivation behind the products are not student engagement and teacher support, but money and profit?

There are two broad sides of the personalization coin; some view personalization as elucidating and others as something virulent. "Variation in definitions and models of personalized learning has created confusion and disagreement," disunity, and an overall awkwardness in best practices within the classrooms (Lokey-Vega, 2019, p. 312). "Teachers and school leaders struggle to make sense of the messy and contradictory descriptions that support

strategic planning and concrete goals. Educators' initial excitement about the promises of personalized learning often quickly wanes as they are left with more questions than answers" (Lokey-Vega, 2019, p. 312). While Lokey-Vega (2019) began her article by addressing teacher attitudes and disappointments, there was no evidence or further discussion about what teacher perceptions are and how they can be improved. Contributing to overall confusion in the educational field is far from best practice and must be addressed.

Education is always changing; reform is constantly at the forefront of state and national level agendas. Best practices are always changing, and, according to educational leaders in Vermont, today's best practice is to teach using personalized learning. In 2017, personalization became the trend in Vermont schools. It will likely reach the rest of the United States. One question that might arise is how personalization affects the new Common Core state standards initiative. Before something else is rolled out to an entire nation, there should be studies that have gone before to prove that it is truly best practice for today's education. It is important to gain teacher buy in or faith in the system and it begs the question if teachers did buy into this practice.

This study emphasized the value that states place in their teachers. Generally, teachers are discouraged by all of the new practices being put in place. Asking teachers how they feel about the process before implementation shows respect to said teachers. If Vermont, for example, is piloting personalized learning plan implementation, then part of the process should be to gather teacher feedback. This study allowed for such feedback. Then before it makes national recognition, an opportunity for addressing teacher concerns is evident.

Research Question

RQ1: Is there a difference between teacher attitudes toward student personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale?

Definitions

1. *Personalization* - Each student should have a *learner profile*, or a record documenting one's academic strengths and weaknesses, motivations, and goals. Students should have personal learning paths that encourage them to set and manage their individual academic goals. Students should follow a *competency-based progression* through topics, and their learning environments—in most cases, schools—should be flexible and structured in a way to support their goals (Cavanagh, 2014).
2. *Traditional classroom setting* - One size (or curriculum) fits all students (G & D Associates, 2011).
3. *Standardized Test* - any form of test that (1) requires all test takers to answer the same questions, or a selection of questions from a common bank of questions, in the same way, and that (2) is scored in a standard or consistent manner, which makes it possible to compare the relative performance of individual students or groups of students (EdGlossary, 2015).
4. *Common Core state standards* - The Common Core is a set of high-quality academic standards in mathematics and English language arts/literacy (ELA) (CoreStandards, 2017).
5. *Best practice* - existing practices that already possess a high level of widely-agreed effectiveness (Alber, 2015).

6. *Personalized learning plans* - A personal learning plan (or PLP) is developed by students—typically in collaboration with teachers, counselors, and parents—as a way to help them achieve short and long-term learning goals, most commonly at the middle school and high school levels. Personal learning plans are generally based on the belief that students will be more motivated to learn, will achieve more in school, and will feel a stronger sense of ownership over their education if they decide what they want to learn, how they are going to learn it, and why they need to learn it to achieve their personal goals (EdGlossary, 2014).
7. *Differentiation* - Differentiation is one of three elements of personalized learning and involves changing the instructional approach to meet the diverse needs of students. Differentiation may involve designing and delivering instruction using an assortment of teaching styles and giving students options for taking in information and making sense of ideas (Culatta, 2016).

CHAPTER TWO: LITERATURE REVIEW

Overview

The purpose of the literature review contained in Chapter Two was to define personalized learning, determine the relevance of personalized learning plans in the classroom, give a brief history of personalized learning, and provide a theoretical framework for the research conducted regarding teacher attitudes toward the implementation of personalized learning plans. This chapter ends with a near-comprehensive analysis of the vast theories on personalized learning and a review of the related literature, followed by a brief summary thereof.

Theoretical Framework

Personalized Learning Defined

The educational community is frequently called upon for reforms in offering high-quality learning opportunities to all students. One of the latest learning opportunities is through the development of personalized learning plans. Personalized learning plans place the student at the center of the teaching and learning classroom experience, reaching a variety of learning modalities, using a multitude of techniques and methodologies, and providing access to technologies to facilitate individual learning styles and topics. Personalized learning has been defined in the Glossary of Education Reform as "a diverse variety of education programs, learning experiences, instructional approaches, and academic support strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students" or "an alternative to one-size-fits-all instruction; it is student-centered learning" (Tomlinson, 2017, p. 12). Personalized learning emphasizes the importance of student engagement and enthusiasm in relation to education. To ensure that students are engaged, it has

been suggested that topics for study align with student interests, that there are opportunities for hands-on learning, and that students are given a voice when choosing their assignments.

Personalized learning acknowledges student interests, voice, choice, and needs. A personalized learning plan is more than *what* the students are learning but also includes *where, when,* and *how* they are learning it in an effort to maintain student engagement, achieve academically, and prepare for future educational opportunities (Vermont Agency of Education, 2017a, p. 1). Students are directly involved in the planning process when it comes to their instruction and help develop their personalized learning plan in a selection of formats, which are essential in determining and tracking their personal academic goals both short and long-term. Students can typically access their learning plan at school or home to gain better understanding of their status in achieving their goals and determining what else to work on or develop in light of their future aspirations and steps to success.

When teachers and students, as well as other stakeholders—administrators, parents, community members, colleges—participate in developing a *learner profile*, they are considering the "strengths and gap areas, motivation and goals, learning styles, and other personal data related to their learning experience and needs" (Next Gen, 2016, p. 1). By considering these individual aspects of each student, the teachers, parents, and other stakeholders are getting to the student on a deeper, more personal level, especially where they are, where they want to be, and how to get them there. The learner profiles encompass "student-driven documents" (Next Gen, 2016, p. 1), which ensures that the students have a choice in what to include in their profile, selecting what they feel is their best work, exemplifying their strengths and showing growth in their weaknesses.

Personalized learning plans must encompass a series of goals, for example, “daily actionable goals” to enable the students to see the process of achievement (Next Gen, 2016, p. 1). In order to follow the steps towards individual academic achievement, there needs to be a constant flow of feedback and data-driven results factored with goals and future plans, with as many details as possible revolving around growth and success. Students need to be able to track changes in their achievement on a daily basis to establish more concise goals and steps to get where they desire to be. Teachers, parents, and administrators benefit from the constant detailed tracking of individual student progress as well, because it keeps everyone involved on the same page when it comes to the student’s learning, creating a team of people to aid and enable the student toward success. Constant detailed assessment, grading and tracking, allows for transparency in the learning process. None of the stakeholders—students, teachers, parents, administrators—will be surprised because they should all “have a much clearer idea of what they need to do to show mastery and they are able to see the incremental steps they are taking to get there” (Next Gen, 2016, p. 2). Again, this model emphasizes the importance of student voice and choice.

Another essential element of personalized learning plans and the development of individual learner profiles is the use of technological tools. The learner profiles should be built in a digital program that will allow all of the stakeholders’ access to the data and assessments at any time, especially since daily checking goals and tracking steps is important to demonstrating understanding of achievement and student needs. More than having a data-driven assessment tool for developing the learner profile, technology is a large part of society, especially amongst students. Therefore, it is essential to incorporate as many appropriate technologies as possible in the student learning plans, allowing them to experience a variety of programs, styles, and tools.

Due to the affordability and accessibility to schools, there is a wealth of available technological tools to help track data within personalized learning plans.

Relevance of Personalized Learning Plans

One of the greatest challenges of personalized learning is that there are a number of different philosophies, and not one has proven more effective over others. There is a lack of thorough research as it relates to developing personalized learning plans. Since individual students factor into the process, including their personal interests, goals, and aspirations, there is not a one-method-fits-all in personalization. The subjects of each study are unique and constantly changing. While there may not be one approach to developing personalized learning plans, there are a variety of strategies and suggestions that teachers and administrators can explore and employ. Fisher (2016) wrote,

> Our hope is that the research community can begin to coordinate a more complete research cycle in order to surface the breadth and depth of information needed to support personalized learning environments. Otherwise, as more schools embrace personalized learning, *at best* each school will have to go at it alone and figure out by trial and error what works for each student. (p. 3)

Without a standard process and definition of *personalization*, there is not a systematically agreed upon philosophy. Therefore, personalized learning will take on many different forms in varying degrees at the schools that choose to implement it. Others may fail to implement personalized learning plans because it seems like another do-it-yourself fad, rather than being accompanied by data-driven, field-tested research. In order to be considered a best-practice, there needs to be collaboration on research methods in defining personalized learning and developing best-practice steps to achieving this in the classrooms of schools. Fisher (2016) identified the current end of

research surrounding personalized learning after publishing the "on average" results where "researchers publish the results of these studies - often as academic articles - that explain the effectiveness on average of a given intervention" (p. 3). The research fails to "observe anomalies and sort by circumstance" where "researchers dig in through a series of 'n of 1' studies or other methods, to understand anomalies to their findings and study the specific circumstances in which their results did not accurately predict what actually occurred," and fails to "refine theory of causation" by going back and testing new hypotheses based on their research and results (Fisher, 2016, p. 3). There are obvious gaps within the research of personalized learning plans.

There are other challenges of personalization beyond the current research flaws, including the notion that there is not *one* widely accepted and used definition of personalized learning. This can create a strong environment of confusion when attempting to implement personalized learning plans. Also problematic is the school's ability to use learner profiles to track non-academic data, like "behavior, attendance, socio-emotional skills" (Pane et al., 2017, p. 9). One group of researchers identified challenges present in the implementation of personalized learning paths, including inadequate time available when it came to developing personalized lesson plans, the availability of high-quality technological tools, trying to allow student interest whilst meeting standards, and the difficulty involved with student collaboration as they are all working on something different.

Personalized learning constructs promise a future of academic success and engagement to students, an environment tailored to student interests, and achievement for schools. Yet there are difficulties that must be worked through before such a future is achieved. Personalized learning offers great ways to develop connections with students, connections with parents, teachers,

students, administrators, and peers, as well as opportunities for students to genuinely connect with their learning. Personalized learning plans allow for individuals to address their strengths, weaknesses, future goals, and effectively chart their progress as they work towards achieving those goals. The current research needs to move beyond where it is presently frozen and address several major concerns where personalization remains a hazy "too-good-to-be-true" idea, but impossible to facilitate and sustain. As education professionals eagerly await the future of personalization, perhaps educational reform will continue to address the promises of personalized learning, developing and improving upon the constructs of student-centered learning, finally ensuring ease of facilitation for teachers and presenting the academic benefits to all stakeholders.

Timeline

Personalized Learning Plans have gained a lot of attention in the state of Vermont. It first appeared informally in 2002 with the 12 principles of *High Schools on the Move* (Vermont Agency of Education, 2017a). The Vermont Agency of Education (2017a) shared in the What and Why of Act 77 that High Schools on the Move, published in 2002, describes the work and conclusions of a task group charged by the State Board of Education (SBE) in 1999 with addressing "the critical issues facing Vermont high schools" (p. 2). Twelve principles were identified which remain at the heart of the reform effort today (p. 1). Within the 12 principles, the importance of personalized learning plans resonates throughout.

The Future of Education in Vermont, a 2007 publication, articulated the joint vision of the SBE and the Commissioner of Education at the time (Vermont Agency of Education, 2017a). It identified five statewide components to be addressed: student-centered education, leadership, flexible learning environments, engaged community partners, and indicators of success. In 2009,

the Vermont Legislature developed and passed what became Act 44 (Vermont Agency of Education, 2017a). This contained the first use of the phrase "Flexible Pathways to Graduation" and established the goal of a 100% graduation rate by 2020. While much of Act 44 was in session law only, it was the basis for the statutory language that would become Act 77 (Vermont Agency of Education, 2017a).

In 2011, an informal study was conducted by the Department of Education to "uncover both opportunities and challenges related to two major policy directions that are currently driving high school transformation in Vermont: flexible learning pathways and proficiency-based graduation models" (Vermont Agency of Education, 2017a, p. 1). The resulting Policy Research Team Final Report offered seven "Essential Recommendations," all of which find reference points in Act 77. The heart of Act 77 is Flexible Pathways to Learning defined as "any combination of high-quality academic and experiential components leading to secondary school completion and postsecondary readiness, which may include assessments that allow the student to apply his or her knowledge and skills to tasks that are of interest to that student" (Vermont Agency of Education, 2017a, p. 2). This law, Act 77, stated that all students in grades 7-12 will have Personalized Learning Plans. It says, "personalized learning and personalized instructional approaches are critical to students in kindergarten through grade 6 as well" (Vermont Agency of Education, 2017a, p. 2). Although, the law only requires personalized learning plans for grades 7-12, it highly encourages implementation for K-12.

Personalized Learning Theory

Personalization has many roots that date back to the early 1900s. Although it is being described as a theory itself, it rests on the foundation of many theories before it. In short, Hanover Research (2012) stated that "The premise of the theory rests on the assumption that

given the ability to self-direct their learning, students will make greater gains in achievement due to increased interest and customization" (p. 7). According to Hernandez (2016), "Personalized learning theory is built on the twin pillars of 1) differentiated learning pathways for students and 2) feedback that enables students to make informed judgments about what they've learned, how well they've learned it, and what to learn next" (p. 10). The second pillar appears to rely on student self-assessment.

Personalized learning theory is a complex term to describe an approach to education. In fact, personalization is often confused with individualization and differentiation because it encompasses these goals in its approach and is geared to individual learning needs. The U.S. Department of Education defined personalization as instruction that is geared to individual learning needs (individualization), specifically designed for styles (differentiation), and meets student interests and goals to encourage engagement and motivation for learning (Powell, 2019).

Personalized learning alters the traditional approach to the classroom by addressing many disadvantages of direct instruction implementation (Hammond et al., 2019). Educators are faced with surmounting difficulties including the increased pressure to meet national and state standards, larger curriculums to encompass those standards, limited instructional time, decreased student engagement, decreased student motivation, and more. Through the use of the personalized learning theory, combined with proper technology, limited instruction time can be adequately enhanced through meaningful learning experiences tailored to individual learning goals. Feedback and progress tracking can help monitor student achievement of the standards, increase motivation and achievement, giving students a voice in their educational experiences, and relieve pressure off the educator to be the sole mode of instruction. Personalization gives students a measure of control over their own learning, allowing them control and ownership,

demanding their participation and involvement in their knowledge construction (Hammond et al., 2019). Teachers become more of a coach and facilitator than lecturer.

One of the greatest challenges facing teachers in becoming a coach and facilitator is proper professional development. Requiring teachers to change their thinking from lecturer to coach and facilitator requires adequate training that engages them—training that is also personalized (Hyde, 2015). Teachers need to be encouraged that their experiences and knowledge is valued, encouraged, and applicable to the new learning surrounding personalized learning environments. Teachers also need the opportunity to have control over their learning, high-level participation and engagement in constructing their new learning, and the opportunity to explore and experiment with a variety of learning modalities and manipulatives.

Personalized learning is greatly impacted by the use of appropriate technology to drive the individual learning experience. "The learning experience is a personal one… Individuals' prior knowledge, beliefs, interests, and motivations are known to influence the way they engage in computer-based learning," as one group of researchers suggests (Bernacki & Walkington, 2018, p. 1). It is also integral to personalize the context of individual learning. Personalized contexts lead to greater engagement and interest in learning—leading to "feelings of enjoyment and value" and personal life experience (Bernacki & Walkington, 2018, p. 3). When students see the relation between their real-world interests and meaningful learning experiences, there will be greater incentive to further engage in learning experiences of all kinds. The study by Bernacki and Walkington (2018) demonstrated results where "personalization improved efficiency of learning, and demonstrated personalization also improved classroom test performance" (p. 15). This is one study that showed some kind of performance improvement. Real-world relationships to learning are also important for teacher's professional development.

Providing real-world connections that the teachers value, making meaningful connections, will permit the teacher to have deeper experiences in applying the newfound skills “in ways that support or enhance their current real-world" (McCarthy, 2015, p. 3). Making the connections not only helps the student but helps the teacher.

Personalized learning theory uses a variety of approaches, differentiates learning for the many styles and student needs, and requires a certain learning environment to be effective. The teacher must help facilitate student independence while at the same time encouraging students to work together and learn from one another. “This characterization draws of generative accounts of agency, social learning, self-regulation and autonomy, and collective intelligence and distributed expertise” (Deed et al., 2014, p. 67). Teaching and learning strategies for effective personalized learning include:

> flexible use of space and time; social reforming the classroom as community space; reflexive interactions between teacher-student and student-student within which they make choices and experience the consequences of those decisions; pervasive use of technology allowing students to plot and shape their own (at times disjointed) learning pathway; and drawing on collective intelligence to inform problem solving approaches to game design. (Deed et al., 2014, p. 67)

The personalized learning theory seeks to create a classroom where the student is responsible for constructing their own learning with the help of a teacher-guide-facilitator to help motivate and engage the student through significant, hands-on learning experiences to meet students’ needs. John McCarthy (2015) addressed one common myth about differentiation as “a collection of strategies,” when, in fact, “any strategy can be differentiated if we know the learner’s current skill level,” with the understanding that the strategy is backed by evidence that it supports

learning (p. 1). Differentiation and personalization are not all that different when you allow the learner to drive the instruction.

There are a number of theorists that play a part in the evolution of personalization and even personalized learning plans. Theorists that shed light on the subject are Jerome Bruner, Jean Piaget, John Dewey, Seymour Papert, David Kolb, and Lawrence Kohlberg. Additionally, one modern theorist, Lucy Calkins, plays a key part in her theory of conferring.

Jerome Bruner: Discovery Learning

A comprehensive view of personalized learning leads to a consideration of learning theories like constructivism and discovery learning. Discovery learning is a form of constructivism developed by Jerome Bruner. Bruner (1961) wrote, "Our aim as teachers is to give our students as firm a grasp of a subject as we can, and to make him as autonomous and self-propelled a thinker as we can—one who will go along on his own after formal schooling has ended" (p. 22). Bruner advocated for a student's personal responsibility to develop their own learning, a constructivist approach that enables a student to experience and engage with their learning under the guidance and support of a highly qualified educator. Discovery learning, as advocated for by Bruner, is believed to successfully encourage student engagement, motivation, independence, creativity, and the ability to problem-solve. In short, discovery learning strives to individualize a student's learning experience—personalizes their learning in meaningful ways.

Discovery learning demands active participation in learning, engagement in inquiry-based methods of instruction. The primary principles in the discovery learning model include problem-solving, learner management, integration and connection between prior and new knowledge, analyzation and interpretation, and failure with appropriate feedback (Pappas, 2014). Benefits to discovery learning are the ability to encourage students' active involvement and

creativity in constructing their learning, the adjustability, the influence on student autonomy and independence, and these advantages lead to greater retention. While there are many benefits to operating under the discovery learning model, there are also many drawbacks. The discovery learning model does not provide a framework for instruction, leaving educators to attempt to facilitate personalized learning for students. This leaves educators in a disadvantaged place having not been thoroughly trained in the methods of personalized learning, including the discovery learning model, despite knowing its value and success. These disadvantages cause the teachers to be limited, and these limitations do not enable high-quality education. Discovery learning also tends to deny that there are aspects to education that all learners need.

One of the largest disadvantages to the discovery learning model is the lack of guidance and development teachers have in facilitating it. Teachers must evaluate their practices and goals to establish the benefits of incorporating a discovery learning model in their instructional program, as well as the costs and negatives. The unpredictability that accompanies discovery learning models can be overwhelming for educators, and as one group of researchers establishes, "teachers often expect that implementing GDL [guided discovery learning] requires large investments against what would be at least unpredictable benefits (cost-benefit)" (Janssen, 2014, p. 72). One of the costs involved is the time it takes to design effective GDL lessons, especially with a lack of experience and knowledge. One potential solution to this problem is the evolutionary planning theory put forth by Polluck (Janssen et al., 2014, 73). Polluck instituted a step-by-step method to approaching designing GDL lessons, and many teachers respond to clear guidance and direction. This inspires positive and successful implementation in the classroom. Polluck's methodology of the step-by-step approach begins with establishing a lesson flow with innovative approaches, engages the students in activities that demand and encourage

participation, and promotes engagement in professional development that continues training them on innovative practices.

Jerome Bruner connected to personalization through his discovery learning model, inquiry-based instruction. Pappas (2014) evaluated, "This popular theory encourages learners to build on past experiences and knowledge, use their intuition, imagination, and creativity, and search for new information to discover facts, correlations, and new truths. Learning does not equal absorbing what was said or read, but actively seeking for answers and solutions" (p. 1). The Discover Learning Model integrates five main principles: problem solving, learner management, integrating and connecting, information analysis and interpretation, and failure and feedback.

Bruner's theory and models thrives on interactive experience. The learners should reach the end goal on their own, through their own explorations, manipulations, questioning, and performing experiments. Pappas (2014) continued "Instructors should use stories, games, visual aids, and other attention-grabbing techniques that will build curiosity and interest, and lead learners in new ways of thinking, acting, and reflecting" (p. 2). And finally, Pappas shared that "Children can tackle challenging topics in age appropriate ways. These topics can be revisited and expanded upon year after year" (p. 3). Bruner offered a unique way for students to discover learning autonomously.

Jean Piaget: Constructivism

Jean Piaget's research and theories led to the development of constructivism, based loosely on ideas set forth by Vgotsky and Rogoff. Vygotsky "focused on the sociocultural dimension of knowledge" and Rogoff "focused on the role of the community and institutional practice" (Hyde, 2015, p. 289). Constructivism bases the construction of knowledge on social

interactions and experiences. Constructivism realizes the active participation in learning by an individual in the categorization of prior knowledge and new knowledge with a basis on experiences, including social ones. Constructivism identifies the importance of assimilation, categorization and sorting of knowledge, and accommodation, the ability to sort new knowledge that does not fit a learner's construct. "The purpose of constructivism is, then, for the individual to construct her or his own meanings out of the elements of individual experience…and then to adapt these meanings so as to form a coherent worldview" (Hyde, 2015, p. 294). The idea of constructivism, then, aligns directly with personalized learning, because each individual's experiences and reflections are unique.

Constructivism changes the purpose of the teacher in the classroom. Following the trend of personalization in learning, the students take a central role in the classroom, contrary to the traditional approach of direct instruction revolving around the teacher as a lecturer. The role of the educator in a constructivist approach is to facilitate and encourage students to pursue active learning experiences to create new knowledge and reflect on it. The teacher must ensure that students engage in appropriate experiences to further their knowledge and continue facilitating experiences that build on their learning. The teacher needs to understand each student's prior knowledge and their learning constructs to engage students in meaningful experiences. Constructivism relies strongly on real-world experiences and opportunities to problem solve and proper support and interaction with teachers and peers. This approach to learning prompts students to act on their interests and, based on their existing knowledge, apply, hypothesize, test, and form conclusions based on their experiences. Constructivism requires that students be actively engaged in their learning and that teachers facilitate, coach, and prompt students to

understand their experiences. This function of the educator demands that teachers have to learn to ask appropriate questions, so students can make the appropriate, meaningful connections.

A constructivist approach to education alters the fundamental aspects of a traditional classroom. The curriculum focuses on large concepts but allows for fluctuation within the parts of each skill so that students have freedom and control over the development of their learning. Students learn to ask and answer questions and reflect on their experiences. Materials used in the classroom are hands-on and interactive to encourage the students to physically experience their learning. Learning takes place in groups with their peers under the guidance and facilitation of the teacher, because learning is as much about physical experience as it is about social interaction.

Carey et al. (2015) reminded the reader of the importance of expressive power in connection with Jean Piaget's theory of constructivism. Expressive power is defined as "a function of conceptual primitives and the combinatorial machinery through which complex concepts are built" (Carey et al., 2015, p. 38). Piaget argued that deep understanding, knowledge construction, and complex thinking is derived from experiences. Although, Piaget would debate that these experiences must include a qualitative change through expressive power especially in the area of mathematics and mathematical development. Carey et al. (2015) continued to say that "Constructivism requires the acquisition of new conceptual primitives, or of new combinatorial machinery, resulting in the capacity to think thoughts previously *unthinkable* (not merely previously *unthought*)" (p. 38). The emphasis is that the learning is through experience.

Peterson (2012) stated that "In Piaget's view, knowledge was not to be construed as pre-existing in reality, but only came about by virtue of the individual's formulations in response to specific observations and experiences" (p. 883). Piaget believed that one must construct their

knowledge; it was not hereditary. One must respond to experience and from that experience, learning via constructivism occurred. This is important to note because personalization brings the student interest to the heart of the curriculum. Piaget's pedagogy for constructivism is as follows:

> [First,] an operation is an action that can be internalized; that is, it can be carried out in thought as well as executed materially. Second, it is a reversible action; that is, it can take place in one direction or in the opposite direction .... The third characteristic of an operation is that it always supposes some conservation, some invariant. It is of course a transformation, since it is an action, but it is a transformation that does not transform everything at once, or else there would be no possibility of reversibility .... The fourth characteristic is that no operation exists alone. Every operation is related to a system of operations, or to a total structure as we call it. (Piaget, 1970, pp. 21–22)

The internalization of the student is the first step of constructivism. Additionally, the first step of personalization is the internalization of the student.

John Dewey and Jean-Jacques Rousseau: Evolution of Personalized Learning Theory

The idea of personalized learning centers itself around the student, individual experiences, interests, and constructs of their own learning. Personalized learning manifests itself in many ways and, as a result, leaves a digital footprint. Shulman (2016) wrote, "Indeed, the definition of *personalized learning* can easily expand to include the digital footprint that a student creates in the journey toward an educational goal" (p. 1). This footprint provides an opportunity to track a student's learning modality, preferences, working strategies, and methods of engagement. It also allows for the generation of data concerning student learning and success. The big data collected could be used toward a variety of ends, including aiding in the educational

experiences of special needs students, and ensuring all students' success—ensuring the achievement of educational goals at every level, local, state, and national. Data collected on students' personalized learning promises a future of success in efficient and customizable ways (Shulman, 2016).

"The combination of big data and adaptive technological platforms is heralded as a revolution that could transform education, overcoming the outdated classroom model, and realizing the progressive vision of interest-driven and self-initiated learning" (Dishon, 2017, p. 272). The importance is that learning follows the interest. Dishon (2017) compared personalized learning with Jean-Jacques Rousseau's theory of learning, "well-regulated freedom" (p. 272). Rousseau believed in the importance of individualized education to ensure the natural progress of the learner. Early education, then, in Rousseau's opinion, relies upon the physical world and experience. A student is depended on to construct their own learning and develop naturally as it relates to their own experiences, thoughts, and inclinations. Students needed to be free to explore, and educators needed to direct the child's natural tendencies toward what would help them prepare for the future. One might even suggest that Rousseau believed educators were meant to restrain students from experimenting beyond their limits before they are capable (Doyle & Smith, 2013). Dishon (2017) asserted that Rousseau's theory of learning could supplement where John Dewey's research and theory of learning falls short. John Dewey placed an emphasis on meaningful and experiential learning, and the responsibility of the educator to facilitate a student's investment in his or her own learning. Dewey and Rousseau would agree that learning must be personalized, meaningful, and hands-on, but would disagree in the role of the educator and the general makeup of a student's education. The problems with

Dewey's are the relevance of a student's basic skill and knowledge, the impact to classroom management, and the fragmentation of the teacher's authority.

Personalized learning theories center on learning that "is meaningful and relevant to learners, driven by their interests, and often self-initiated" (Dishon, 2017, p. 273). The drive for collecting big data on personalized learning drives further reform in education toward workplace preparation and competition; the data gained from the digital footprint of personalized learning, the success and development of individual skill and knowledge, propels the competition for entering the multinational workforce, especially in highly sought-after careers. There are a multitude of definitions and theories regarding personalized learning, and the central aspects focused on include individualized student created goals based on competencies, customizable learning paths based on individual need, and student control over their learning path through a variety of adaptable learning platforms (especially digital ones) (Dishon, 2017). Big data in personalization can increasingly support the shift from standardization to personalization, with the support of highly educated teachers who guide students' experiences and interactions. The crux of personalization, then, using both Rousseau's and Dewey's theories of learning is to find an appropriate balance between control and freedom in personalized construction of learning.

In order to adapt, and in order to learn, a student must interact with one's environment. John Dewey's educational philosophy was that human beings learn through a hands-on approach, characteristics of pragmatism where reality must be experienced. Leshkovska and Spaseva wrote on a historical-comparative method and content analysis technique that is focused on three intersecting elements: curriculum, methods of teaching and learning, and teachers' role. John Dewey believed in an integrated curriculum that included thematics based on real world problems. Students would be able to express their

learning, their specific identity, through *active* methods of learning, the roots of student-centered teaching. Finally, in order for learning to occur, the teacher must focus on connecting student's personal experience with the lesson of the day and to the generic everyday school life.

Curriculum is such a key component because personalization and personalized learning plans are being integrated with all students in Vermont schools. Leshkovska and Spaseva (2016) shared,

> Human experience presented in books and textbooks is of great importance for the child, because it "gives direction; it facilitates control; it economizes effort, preventing useless wandering, and pointing out the paths which lead most quickly and most certainly to a desired result" (Dewey, 1974a, p. 350). However, the subject matter is not a substitute for a personal experience, for "an actual journey." It has meaning only if related to the existing experience, providing its stimulation and guidance. The absence of this characteristic, according to Dewey, causes many weaknesses of the traditional school. When learning is based on experience, it is characterized by continuity and interaction. Unlike the old school where subjects are taught independently of each other in strictly defined time frames, Dewey stands for connection of subject content and flexible duration of classes, allowing the child to follow his interest in the process of learning. (p. 59)

Vermont students are transitioning from textbooks to personalized learning curricula. Both Dewey's and Rousseau's theory appears to support this transition.

Seymour Papert: Constructionism

Constructionism sounds similar to constructivism but differs in principle and practice. Constructivism, advocated for by Jean Piaget, emphasizes the cognitive and internal aspects of

knowledge construction, while constructionists, under Seymour Papert, relwith subtle, albeit significant, differences. Major ideas in constructionism, centering on socialization, are externalization, objectivation, and internalization (Hyde, 2015). Externalization occurs when individuals act on their knowledge about the world to interact with other individuals. Objectivation occurs when individuals react to another's externalization and it impacts society's consciousness and understanding, the social interactions, in that "Society is a human product. Society is an objective reality. [And that] Man is a social product" (Hyde, 2015, p. 295). Internalization refers to the process when objectivation becomes a social construct and natural ideas in the social world, meaning that individuals view it as natural truth or basic building blocks of knowledge.

Piaget and Kant believed construction is a cognitive activity, where an individual's construct of knowledge determines how they organize their real-world experiences. Constructionism attempts to clarify the process for the organization of experiences, placing emphasis on the actual activity and experience. Seymour Papert determined in his theory of constructionism that "students are particularly likely to make new ideas and construct knowledge when they are engaged in building objects or making the products by themselves" (Tangdhanakanond et al., 2006, p. 25). Constructivism believes that a student's learning occurs as the student sorts and organizes experiences, but constructionists argue that a student's learning occurs as a result of the actual physical experiences. More important than physical individualized, hands-on experiences, are the interactions students are encouraged to participate in with their peers to reflect and discuss on the experiences and creations they participate in. The classroom learning environment, the materials, the ability to facilitate appropriate peer-to-peer discussions and interactions are essential priorities for the educator. An educator would need to

enable students to engage in meaningful experiences with suitable physical materials and manipulatives that would personalize their learning. Personalized learning under the theory of constructionism results in greater student success because the experiences relevant to a students' development of knowledge would be individually tailored, piquing student interest.

Constructionism is a student-centered approach to education; it is project-based, where students operate under a teacher's coaching, so that students can successfully teach their own peers about their experiences and learning. Students establish their own learning goals, and teachers assess based on the success of achieving those goals while simultaneously guiding the students indirectly in their goal development. Constructionism combined with technology geared for personalization furthers student success by engaging students' learning based on their interests and also provides a way to track student success, while contributing to data-driven results on student success.

Personalization under the constructionist theory emphasizes the importance of teacher motivation to develop a learning environment with access to tools and resources, diversifying and accommodating for student needs, and evaluating students individually based on their goals and learning constructs (Ignatova et al., 2015). Papert was of the opinion that "The theory of constructionism states that learning happens especially well when children are engaged in constructing a meaningful product, such as a sandcastle, a poem, a machine, a story, a computer program, or a song" (Falbel, 1993, p. 3). Materials are a large part of the constructionist approach, but equally important is the learning environment and social context.

Constructionism goes one step further than constructivism in the fact that the student must build objects or make products in order to make new ideas and construct knowledge. Seymour Papert developed this cognitive learning theory. Tangdhanakanond et al.

(2006) stated that “Portfolio is potentially an authentic assessment tool for assessing student learning applied in a complex, real-world situation; it reflects many types of student performances i.e. individual abilities and characteristics, as well as growth and progress as seen through their created products or artifacts” (pp. 259-260). One of the aims of personalization, and Vermont’s Flexible Pathways of Learning, is that students are assessed according to their personalized learning plan, sometimes called student portfolios.

Tangdhanakanond et al. (2006) shared that Papert believed intellect was formed through the “active construction of something outside of one's head-something tangible that others can see, critique, and, perhaps, use” (p. 259). To emphasize the importance of social skill development, “Papert indicated that a constructionist learning environment also allows students to show, discuss, examine, and collaboratively reflect on the cognitive artifacts or product that they create. In this way, their content area knowledge, habits of mind, and social skills will be developed” (Tangdhanakanond et al., 2006, p. 259). Although personalized learning plans and the beginning stages take the form of a constructivist approach, one of the intents is to provide flexibility, allowing the student to create and produce a work. Personalization stresses the importance of student-centered learning. There are no limits to what students can do in order to prove their mastery in subject content. Therefore, constructionism is not a far-fetched idea in the world of personalization, personalized learning plans, and flexible pathways to learning.

David Kolb: Experiential Learning

David Kolb’s theory of experiential learning finds a basis on research promulgated by Dewey, Lewin, and Piaget. In the information approach to learning, experiential learning rests heavily on the hands-on approach and meeting a variety of learning styles. Experiential learning can also be described as “active learning, interactive learning, or ‘learning by doing’”

(McCarthy, 2016, p. 91). Many understand that students learn through personal investment and hands on activities which lead to their success and achievement. Personalized, meaningful experiences are recommended and essential. Kolb's model melds experience, perception, cognition, and behavior through several approaches to meet each learning style.

Kolb emphasized the importance of the circular process where effective learning occurs in his model. There are four stages in this process, two pairs of polar opposites: concrete experience and abstract conceptualization (grasping experience) and reflective observation and active experimentation (transforming experience) (McCarthy, 2016). The learner must go through each stage of the process to thoroughly understand information "experiencing, reflecting, thinking, and acting" (McCarthy, 2016, p. 93). One positive aspect of the circular process is that the learner can begin at any stage, but true learning cannot occur unless the learner engages with each step.

Advocates of experiential learning "believe that it promotes greater interest in the subject material, enhances intrinsic learning satisfaction, increases understanding and retention of course material, develops the desire and ability to be continuous learners, improves communication, and interpersonal, problem solving, analytical thinking, and critical thinking skills of the students" (McCarthy, 2016, p. 96). Student success is directly related to student engagement, so developing a method of learning where the student must be active and experiential in their learning ensures that success.

Hands-on experiences and activities are essential in experiential learning, as are "problem-based learning, project-based learning, inquiry-based learning, student-directed learning, and active learning" (Breunig, 2017, p. 213). Traditional approaches to learning in the classroom do not engage students as much as experiential approaches to learning. A negative

aspect to experiential learning is the risk of building educational experiences in for the sake of experiences, rather than meaningful activities. Students also need to have a voice in their education and the experiences for their learning development.

In the experiential learning model, experience precedes learning, where students learn by active participation, or learn by doing. Similar to Piaget's constructivism, learning is not merely a cognitive function based on experience, but a physical directly related to the student's involvement and experiment. As Brailas et al. (2017) wrote, "learning can only take place when the learner is engaging in an active process of building and creating knowledge through participation and interaction" (p. 272). Group activities are also pivotal to student experiences, and one large responsibility of the teacher is to guide proper group/peer interaction and involvement in experiences geared for learning. These activities should also be tailored to student needs and learning styles, personalized. Personalization in experiential learning can also exemplify itself in the opportunity students have to enter the cyclical process by Kolb. Some students may prefer to participate in the transforming processes of learning first and others might prefer to begin in the grasping part of the process.

David Kolb developed the Experiential Learning Theory. What sets this theory apart from other learning theories of its kind is the added piece of reflection. The theory is known for its learning through reflection of the hands-on learning and the learner is in a completely passive role. Wurdinger and Carlson (2010) defined experiential learning as "any learning that supports students in applying their knowledge and conceptual understanding to real-world problems or authentic situations where the instructor directs and facilitates learning; the crux of the learning occurs during the reflective process where students assess their decisions in the light of natural

consequences, mistakes, and successes" (p. 20). The student must take ownership of their learning which happens during the reflective process.

To continue, Wurdinger and Carlson (2010) explained the elements of David Kolb's experiential learning as "reflection, critical analysis and synthesis, opportunities for students to take initiative, make decisions, and be accountable for the results. It provides opportunities for students to engage intellectually, creatively, emotionally, socially, or physically" (p. 21). Lastly, the key component of experiential learning, reflection, "deepens learning and helps students to transfer their previous learning to new contexts, master new concepts, principles, and skills, and articulate how they developed this mastery" (Wurdinger & Carlson, 2010, p. 22). One emphasis in schools today is integrating multiple subjects, allowing for transference of information.

Lucy Calkins: Conferring

Ball (2017) defined conferring as "a means of both assessing and providing targeted individualized instruction to students in a way that no whole class instruction can. It is a means by which teachers can quickly gather information about their students to determine where they currently fall on a continuum of learning, and then begin to help them move to the next level of performance" (p. 2). Conferring, as defined by Julie Kallio in Ball (2017), is a "regular, goal-oriented meeting between the teacher and student(s) where they talk about learning progress, process, and/or products. Conferring, more simply, is a way to provide more personalized feedback" (p. 3). Very similar to personalized learning plans, conferring includes conferencing, goals, and reflection.

Lucy Calkins has advocated for a teaching technique known as conferring. Conferring has been mistaken for a traditional question-answer approach in the classroom but differs in several significant ways. Conferring allows for a greater connection with students and provides

an opportunity for a teacher to listen to the student, to think about the student's question or answer, to use the opportunity to teach or guide, and to allow the student to try to apply or experiment with new information. One of the aims in conferring with students is to engage them more actively in their learning and propel their self-awareness in achieving their educational goals. By conferring with the students in the Calkins manner, students have more of a say in their education and are given a voice to discuss their goals and achievements. "Student-centered conferring can happen when teachers are aware of their own experiences, ask direct questions about student thinking, probe for further elaboration, and wait for students to join the conversation" (Porath, 2014, p. 627). The teachers cannot do all of the work; the work must be student-centered.

Calkins defied the traditional approach by replacing the skill-drill methods of teaching phonics and instead focuses on the development of the whole language (Ball, 2017). Some argue that a lack of direct instruction is damaging to certain students, while others believe that the Calkins method of instruction does not have adequate content. Calkins believed that students need to reach outside of standard educational content to topics from their real-world experiences, to personalize their learning, because this ensures greater success, engagement, and comprehension. Lines of increased engagement and success can be drawn when the teacher listens more and asks better questions to inspire higher thinking. The primary purpose of the teacher engaging in a conference with the student is to "listen to what students can teach you about the way they think and make meaning" because "you cannot learn from them unless you listen" (Porath, 2014, p. 633). Forging bonds between students and teachers of mutual understanding deepens meaningful learning construction. Students learn about themselves

through self-reflection enabling them to engage in experiences they will find significant. Teachers also learn about their students and what experiences help facilitate that deeper learning.

Malcolm Knowles: Andragogy

Malcolm Knowles developed a theory on adult learning called andragogy (Graham, 2017). Andra- refers to an adult, as opposed to peda- of pedagogy, which refers to the science and practice of child learning. Andragogy is the science and practice of adult learning. There are five pillars in Knowles theory of adult learning: "a maturing self-concept, increasing experience, an increasing readiness to learn, a shifting application and orientation, and an internal motivation to learn" (Graham, 2017, p. 2). Knowles believed that four principles of learning needed to stem from the five pillars. Knowles believed that adults needed to engage with their learning on a deeper level than was expected of children at the time.

Children were seen as empty vessels to be filled in the era of Knowles' research, but adults approached learning as full vessels and these experiences need to be utilized and applied to new learning, requiring active engagement, meaningful learning experiences, and problem-solving activities. Adult learning must be personalized for it to be fully effective and actionable. The content that adults learn need to be implemented immediately, practiced, so that it is seen as useful and applicable. Adults will learn most by doing, according to Knowles. When adult learning is approached in the correct way, Graham (2017) believed the outcomes are: "a mature understanding of oneself, acceptance, respect, and love toward others, a fluid and dynamic attitude toward life, understanding and reacting to causes, not symptoms, and understanding of and ability to change society" (p. 4). The student, or adult student, must understand and appreciate themselves before fully embrace the learning.

When one educates an adult, you cannot discard prior knowledge and experiences the adult possesses. One must recognize that adults learn through lenses influenced by their knowledge and experiences, which are not easily set aside for new knowledge. When possible, new learning to be truly effective and meaningful must be approached in light of past experiences, combining past practices with new ones, and/or applying new practices to past experiences.

Impact of the Research Topic

This topic is clearly worth researching and studying. Simply put, this research stands behind teachers while they are tackling another new practice. Not only does the research stand behind, but beside. For the professional development to be effective in guiding teachers through implementation of personalized learning, the training must itself be personalized for the teachers. By demonstrating properly, ensuring teacher buy-in, and fully engaging the whole teacher with real-world connections and experiences, teachers' confidence will rise in the planning and implementation process for the benefit of the students and learning environment. This study allowed teachers to voice their opinions on the idea of personalized learning plans, implementation, and training. One must consider many aspects of the study: the definition of personalized learning (plans), teacher attitudes of the research topic, and the significance of the study. These aspects are addressed throughout the related literature. This study will allow teachers to share the results of their implementation of personalized learning plans and the results they believe it brings to student achievement.

Related Literature

With the help of twentieth century theorists, personalized learning has age old foundational roots. Furthermore, personalized learning plans have gained a lot of attention in the

last decade. Attention does not necessarily translate into a magnitude of quality research. The research that is available on this topic includes characteristics of personalized learning plans, college student plans, middle school students' study, and a questionnaire developed for student attitudes toward the personalized learning plans. While this research is beneficial to study, it is in no way comprehensive, leaving quite a gap in the literature available for personalized learning plans.

Haney (2017) did a study on personalized learning plans in a journalism college course. She suggested that learning gains were made when students authored their own learning plans. It would appear that college students benefit from personalized learning plans. Even college professors have had a voice in this topic. Toyos (2014) shared the aim of their study as,

> To recognize and interpret the conceptions that instructors have about (personalized) learning and self-regulation, an approach that makes possible to address the students' needs and interests and to reflect on the influence of these beliefs on the teaching and learning process, as well as on the bonds between instructors and students as these bonds are important for the students' development. (p. 1).

Preliminary data found that the professors were not aware that their own pedagogical beliefs within their practice influences student learning: self-regulated and personalized learning. Professors unaware that their beliefs affect student learning may also be unaware how their attitudes affect student learning, and the implementation of strategies like personalized learning plans. Less than positive attitudes about how to use personalized learning plans may negatively impact student desire to author their own learning plans.

Middle school students in specialized education appear to have had conflicting results with the plans. According to Munk and Bursuck (2001), "outcome research for students with

learning disabilities included in general education classes has produced differing and conflicting results" (p. 2). One must consider that the lack of consistency in results with the learning plans for students in specialized education relates to ineffective professional development, accountability in implementation, and attitudes surrounding implementation and professional development. There are so many gaps in this topic at the moment.

Deed et al. (2017) provided another gap example: "an instrument personalized learning environment questionnaire (PLQ) was developed to measure students' perceptions of the factors effecting the implementation of Personalized Learning Plans (PLPs)" (p. 3). Yet, there is no evidence that this instrument has been used due to continued efforts to perfect it. Tools and resources available for teachers to further personalization must be accompanied by quality training on their use. If this is not the case, one must ask why and what can be changed to ensure quality training. Perhaps available trainings and tools should be tested against one another to demonstrate what strategies have worked and are accompanied by positive teacher and student attitudes.

Elementary and middle school teachers have not had the opportunity to participate in a study. Their attitudes toward the personalized learning plans have not been fully considered. Given that the foundation of student education is at the elementary and middle school level, it would be wise to gather data from teachers of these ages. It would be important to gather K-12 student reflections and attitudes on this topic as well. A major element of personalized learning plans is allowing for student choice and voice. It would seem appropriate to ask the students and gauge their attitudes on the implementation of personalized learning plans as well.

Professional development focused on personalized learning plans should also be studied. Considering quality professional development available to teachers and administrators focusing

on personalized learning in conjunction with positive attitudes teachers' have about implementation of the plans would be wise, filling other gaps in the research. Although more and more research and articles are coming to light on the research topic, there are still many questions that need answered. The topic is still in the pre-nationwide stages, definitely still developing. In other words, personalized learning plans are considered to be in the piloting stage in the state of Vermont. One should consider if a more developed philosophy regarding personalized learning plans, professional development, and teacher attitudes toward implementation will help with student achievement. There is a wealth of information ripe for the researcher to study and fill the gaps for personalized learning plans.

Summary

There is no doubt that personalization is the next new educational trend. It seeks to put the student at the center of learning. Yet, part of the implementation process has not been vetted. In other words, if we are expecting teachers to implement the next new trend, then training is a must. Furthermore, the training process must include the ideas from teachers. Professional development for educators needs to be personalized in that teachers' prior knowledge and experiences are considered valuable. These experiences can be used to support and enhance the planning and implementation of personalized learning plans in the classroom. When teachers feel valued and heard, when there is an effective teacher buy-in, then teacher confidence rises. When confidence rises, it stands to reason that teachers will feel secure in achieving their goals of student personalization, and in turn, students will feel confident that their teacher is a proper guide and facilitator for their continued learning. This study will seek out the attitudes of teachers toward the implementation process of personalized learning plans. Specifically, this correlational study will seek the attitudes of teachers who have implemented the personalized

learning plan between one and five or more years. If the data reveal favorable attitudes at certain times, then it will be noted for improvements.

CHAPTER THREE: METHODS

Overview

Previously mentioned in chapter one, the purpose of this study was to determine the overall attitudes of Vermont K-8 teachers toward personalized learning plans. The study compared teachers with one, two, three, four, and five or more years of experience with personalized learning plans. Chapter Three describes the methods used in order to make such a determination. The methodology is discussed, including the research design, research question, hypothesis, participants and setting, instrumentation, procedures, and data analysis.

Design

A causal-comparative research design was used in this study because it was a nonexperimental investigation. This design sought to identify a cause-and-effect relationship and was commonly referred to as "ex post facto" research because the alleged cause and effect have already occurred; it examines the cause and effect "after the fact." The research question, according to the Personalized Learning Environment Attitude Scale, sought to determine a relationship between the two variables: attitudes and personalized learning plan teacher experience. Gall et al. (2007) declared that "the critical feature of causal-comparative research is that the independent variable is measured in the form of categories" (p. 306). The design specifically sought a consequence among the variables. In this study, the design looked for a causative relationship among teacher attitudes (dependent variable) and experience with personalized learning plans implementation (independent variable). Ex post facto was the design because the effect has already occurred**;** note that the teachers have shared their attitudes.

The causal-comparative design is used when independent variables, or groups, cannot be examined by use of controlled experiments because the researcher does not have control over the

independent variable. In this study, there were five groups ranging from one year of experience to five or more years of experience of personalized learning plan implementation. A survey (see Appendix B) was conducted to identify a causative relationship between the years of personalized learning plans implementation and attitudes toward the personalized learning plans. In this case, the survey was conducted, then the attitudes were computed. The survey asked a few background questions, one that included the years of experience with personalized learning plans implementation. Other background questions included age category, gender, education level, teaching experience, and grades taught. The independent variable in the study was teacher experience with personalized learning plans, which Gall et al. (2011) declared as the cause of change. The presumed effect, or dependent variable was the teacher attitudes. The purpose of using surveys was to identify the attitudes, opinions, and abilities of the participants toward a situation or event (Omeroglu et al., 2011).

Research Question

The study worked toward answering the research question regarding the attitudes of teachers toward personalized learning plans. Furthermore, it considered years of implementation experience to determine if there was a cause of differences that already existed among the variables.

RQ1: Is there a difference between teacher attitudes toward student personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale?

Hypothesis

The researcher tested one hypothesis.

$H_0$1: There is no statistically significant difference between teacher attitudes toward personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale.

Participants and Setting

The participants for the study were drawn from a purposive, convenience sample of K-8 teachers located in the state of Vermont from January through March 2020. The teachers were a part of 54 Vermont supervisory unions, or large school districts. The K-8 teacher participants were asked by their superintendents or principals to participate in the survey conducted. Convenience sampling was used in this study because the participants were based on availability and willingness. Purposive sampling was equally important in this study because the K-8 teachers needed personalized learning plans experience and implementation and therefore purposefully sought after. The sample consisted of 150 K-8 teachers across the state of Vermont. Thirty participants in each of the following categories were sampled: (1) 30 in their first year of PLP Implementation experience; (2) 30 in their second year of PLP Implementation experience; (3) 30 in their third year of PLP Implementation experience; (4) 30 in their fourth year of PLP Implementation experience; and (5) 30 in their fifth year of PLP Implementation experience.

According to Gall et al. (2007), a minimum of 30 participants is the desirable number for each subgroup, such as the years of personalized learning plan implementation. Sudman (1976) suggested 100 participants in the major subgroup while a minimum of 20 participants in each minor subgroup. Warner (2013) suggested that 121 participants is the required minimum for a medium effect size with statistical power of .7 at the .05 alpha level (p. 300).
This researcher required 150 participants with a minimum of 30 participants in each minor subgroup.

The participants were from over 50 K-8 schools in the state of Vermont. The participants varied from one year of experience with personalized learning plan implementation up to five or more years of personalized learning plan implementation. Teachers volunteered to complete the survey with the guidance of superintendents and principals. According to the Vermont Agency of Education (2017b), the teachers ranged from 18-70+ years old (though none were younger than 23, nor older than 71), 74.0% female and 20.7% male, with 5.3% who declined to answer. The demographics consisted of 82.0% Caucasian, 8.0% African American, 5.0% Hispanic, and 5.0% other. Preceding the survey, the teachers were asked optional basic demographic questions to include gender, age, educational attainment, years of teaching experience, and current grade level taught. Because the demographic questions were optional, there is a certain percentage of unspecified frequency within each of the categories.

Thirty-one participants in the research study were male, representing 20.7% of the population, with 111 participants indicating they were female, representing 74.0% of the surveyed population, and 5.3% of the participants declined to answer. The greatest percentage of those surveyed fell between the ages 30 and 39. The least percentage of those surveyed were ages 60 and up. Twenty-eight percent of the participants had a bachelor's degree, 58.0% had a master's degree, 5.3% had a specialist degree, and 2.0% had a doctorate degree, with 6.7% declining to specify a level of education attained. Over 69.0% of the participants had at least seven years of teaching experience with only 9.0% being new teachers (0-3 years in a classroom). Among the participants, there was a good representation from each grade level, kindergarten through eighth grade. The group with the highest percentage was from those that were currently teaching eighth grade. See Table 1 for Population Demographics.

Table 1

Demographics

Population Demographics (out of 150 participants)

Demographic Category		Frequency	Percent
Gender	Male	31	20.7
	Female	111	74.0
	Unspecified	8	5.3
Age (in years)	18-29	29	19.3
	30-39	55	36.7
	40-49	33	22.0
	50-59	16	10.7
	60-69	8	5.3
	70+	1	0.7
	Unspecified	8	5.3
Education	Bachelors	42	28.0
	Masters	87	58.0
	Specialist	8	5.3
	Doctorate	3	2.0
	Unspecified	10	6.7
Teaching Experience (in years)	0-3	14	9.3
	4-6	23	15.3
	7-9	30	20.0
	10-19	42	28.0
	20+	32	21.3
	Unspecified	9	6.0
Current Grade Level Taught	Kindergarten	18	12.0
	First	12	8.0
	Second	14	9.3
	Third	13	8.7
	Fourth	17	11.3
	Fifth	13	8.7
	Sixth	13	8.7
	Seventh	11	7.3
	Eighth	25	16.7
	Unspecified	14	9.3

Instrumentation

For this study, a self-report survey was used to gather and measure data, entitled the Personalized Learning Environment Attitude Scale. For the purpose of this research, the purpose

of this instrument, the survey, was to gauge teacher attitudes towards personalized learning plans and the implementation thereof in their own classrooms. The Personalized Learning Environment Attitude Scale (PLEAS) instrument was developed in 2014. Sahin (2014) developed it and used it once for the purpose of collecting data about university students' attitudes towards personalized learning environments. During this 2014 study, the instrument was found to be both reliable and valid. The instrument consisted of 27 questions and one subcomponent, using a five-point Likert scale that ranges from *strongly agree* to *strongly disagree.* If a participant felt strongly toward a statement or question, then they responded as follows: *strongly disagree* = 1, *disagree* = 2, *neither agree nor disagree* = 3, *agree* = 4, and *strongly agree* = 5.

The score range of the PLEAS instrument is 27-135. A score of 27 is the lowest possible score, meaning that, overall, the participants had poor attitudes toward personalized learning plans. A score of 135 is the highest possible score, meaning that, overall, the participants had highly favorable attitudes toward personalized learning plans. A score of 81 or above indicates a favorable attitude, a mean of 3 for each question.

The researcher requested approval from superintendents in the various supervisory unions or school districts to perform the study. Most superintendents sent the survey, on the researchers' behalf, to the K-8 teachers in the respective districts. One superintendent requested that the researcher reach out to principals to gain permission and distribute surveys. Upon contact with superintendents, the IRB permission letter, a letter describing the study, the participant's consent form, and the survey instrument was provided. Once the participants received the survey link, they were required to agree to the following before the survey was provided: participation in the study and acknowledgement that they were 18 years or older,

Vermont-certified K-8 teacher, and that they have had at least one year of personalized learning plan implementation. After acknowledgement, the participants were asked basic demographic questions to include gender, age, education, teaching experience, current teaching role, and how many years of PLP implementation experience.

The voluntary teachers participated in the 27-question survey. At the end of the online survey, participants were asked for an email address in order to receive a $5 Dunkin Donuts e-gift card. All participants were given the same treatment and participant anonymity was not broken.

After all surveys were gathered over approximately two months, the researcher began the process of data analysis, beginning with the scoring of the PLEAS instrument. The researcher recorded the figures for every item response per years of personalized learning plan implementation experience into an Excel spreadsheet. The researcher calculated the total mean and the mean for each subdomain. The means were compared with the neutral score; any response scored above the neutral score represented a positive sense of efficacy, while any response scored below the neutral score reflected a negative sense of efficacy. The data were then inputted into the SPSS software to conduct official data analysis using an ANOVA. The SPSS software helped analyze follow-up, or post hoc, tests for comparison.

According to Sahin (2014), the KMO (Kaiser-Meyer-Olkin) score is .95 and Barlett sphericity is (=6,367.9, .000). With a KMO score of .95, Kaiser would consider this a marvelous suitability for factor analysis. Bartlett's test of sphericity has a significance of .000, again indicating that a factor analysis would be useful with the survey's data. Furthermore, the Cronbach alpha internal consistency coefficient, also known as reliability, is .96. See Table 2 for Cronbach's alpha values. This high value demonstrates a high level of internal consistency.

Permission to use the instrument was granted by Sahin (2014). See Appendix A for the email transcripts requesting permission from Muhittin Sahin to access and utilize the scale. See Appendix B for the instrument.

Table 2

Reliability Statistics

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.959	.959	27

Procedures

The research proposal was submitted to and approved by the Institutional Review Board (IRB), yielding the researcher permission to perform the study. See Appendix C for IRB approval. Upon receiving IRB approval, the researcher subsequently began reaching out to the aforementioned superintendents, seeking volunteer teachers and permission to send the survey on to interested teachers. Most of the superintendents sent the survey to the teachers on behalf of the researcher. Interested volunteer participants were required to agree to certain stipulations before beginning the survey, including questions about their participation in the study and acknowledgement that they were 18 years or older, whether they were a Vermont-certified K-8 teacher, and whether they have had at least one year of PLP implementation experience. The subsequent questions allowed the researcher to gather some demographic data using optional questions. Then the participants could complete the PLEAS survey.

To enable the teachers to access the survey, the researcher sent an email to each district's superintendent. See Appendix E for a sample email. The email stated the researcher's name, the

purpose of the research study, the timeframe of the study, five to seven minutes, and referenced the approval from the IRB. The survey was linked directly in the email, ensuring ease of forwarding the survey to all interested teacher-participants. The link led to a Google form that was created in five sections. The first section required participants to consent to involvement in the study; then, in section two of the survey, teachers had to select yes to the following questions: Are you 18 years of age or older, and a Vermont-certified K-8 teacher, and do you have at least one year of experience with personalized learning plans implementation? If participants answered no to these questions, then they were led to the end of the survey and thanked for their participation. Participants who answered yes, were led to section three of the survey where participants answered optional demographic questions and one required question: how many years of experience have you had with personalized learning plan implementation? In section four, participants completed the 27-question PLEAS survey, found in appendix B of this document. After the participants submitted the survey in section four, they were directed to section five, where they could provide an email address to receive a $5 Dunkin Donuts e-gift card. See appendix D for the Consent Form; see Appendix F for the remaining sections of the Google form.

For the next two months, teachers submitted the survey, while the researcher collected the data. Once thirty participants for each group (one, two, three, four, and five or more years of PLP implementation experience) responded to the survey, the researcher closed access to the survey. The survey responses were converted using a Microsoft Excel sheet using values of 1-5, then inputted into the SPSS software for data analysis.

Data Analysis

For the research question, Warner (2013) stated that "A one-way between-subjects analysis of variance (ANOVA) is used in research situations where the researcher wants to compare means on a quantitative Y outcome variable across two or more groups" (p. 219). The variables in the study were *X*, the predictor and *Y*, the outcome. In the study, the predictor variable was the personalized learning plan implementation experience of one to five or more years and the outcome variable was the attitude of the teacher participants. The two variables were analyzed using the one-way ANOVA. Being that the research study sought to determine if there was a relationship between two quantitative variables, the one-way ANOVA was the best tool for analyzing that relationship because the one-way ANOVA enabled the researcher to compare variables across a quantity of groups, rather than a limited number of groups. Again, the predictor variable included five groups from one to five or more years of personalized learning plan implementation experience. Sahin (2014) stated that "when the coefficient of skewness is smaller than 2.5, or the kurtosis is smaller than 2.5, or the kurtosis of skewness is between +1 and -1, it indicates a normal distribution" (p. 4). This was important to note as the data in the analysis sought normal distribution. Statistical significance would then be evident where $p < .05$. The statistic used to test for the effect size was the test between subjects effects, or the general linear model procedure using the SPSS tools to run an ANOVA and subsequent follow-up tests.

Warner (2013) stated that four assumptions need to be met for the one-way ANOVA to be the appropriate statistic for describing the relationship between the variables: the scores on the Y value should be quantitative and interval/ratio level of measurement, there should be no extreme outliers meaning that the scores should be normally distributed in the sample and in

each group, the variances of scores should also be equal across groups, and within groups or between groups, observations should be autonomous of each other. Preliminary data screening sought to assess whether the distributions of scores on X and Y were nearly normal. In order for this to occur, an assessment of a Shapiro-Wilk for the scores of normality for the variables was examined. In order to determine if there were outliers, a box and whisker plots was used focusing on the scores for each group. To determine if the homogeneity of variance assumption was violated, the Levene test was used.

CHAPTER FOUR: FINDINGS

Overview

As aforementioned, the purpose of this study was to determine the overall attitudes of Vermont K-8 teachers toward personalized learning plans. Using a voluntary survey (Personalized Learning Environment Attitude Scale), the researcher compared data received from teachers with one, two, three, four, and five or more years of experience with personalized learning plans. Data were collected over a period of two months. Chapter Four reviews the research question and null hypothesis. Furthermore, it analyzes the findings of the survey, outlines the descriptive statistics. There are several tables and figures, including box and whisker plots, a Shapiro-Wilk test for normality, the Levene test for homogeneity of variances, and a Welch-ANOVA. Analyzing the survey results, the researcher conducted a process of data screening as it relates to the mean, median, mode, frequency, and standard deviation relevant to teacher attitudes, and years of PLP experience.

Research Question

This study used a causal-comparative design, striving to answer the research question regarding teacher attitudes toward personalized learning plans.

RQ1: Is there a difference between teacher attitudes toward student personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale?

One major consideration was the years of personalized learning plans implementation experience to determine if there was a cause of differences preexisting among the variables. The voluntary participants were from 36 different K-8 schools in the state of Vermont. The survey was conducted with total anonymity. The study was conducted in a single phase with a five-

point Likert scale survey. Over a span of two months, surveys were submitted for analysis. The 27-question survey focused primarily upon teacher attitudes toward personalized learning plans and years of PLP experience (required), with optional demographic data to include gender, age, education level, years of teaching experience, and current grade level taught.

Null Hypothesis

The researcher tested one hypothesis for the proposed research question and endeavored to discern teacher attitudes toward personalized learning plans.

$H_0$1: There is no statistically significant difference between teacher attitudes toward personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale.

Descriptive Statistics

Descriptive statistics were attained on the dependent variable, teacher attitudes toward personalized learning plans, for each independent variable group: one, two, three, four, and five or more years of personalized learning plan experience. Descriptives can be found in Table 3. As demonstrated in the table, the mean scores for each independent variable group range from 3.36 (one year) to 3.71 (five or more years), with a total mean score of 3.5. One could also note the *N* values or frequency demonstrating the number of participants in each group.

Table 3

Descriptives

Descriptives

PLEASAVG

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1 year	30	3.3563	.81739	.14923	3.0511	3.6616	2.00	4.59
2 years	30	3.4967	.71971	.13140	3.2279	3.7654	2.11	4.78
3 years	30	3.5563	.79180	.14456	3.2607	3.8520	2.04	5.00
4 years	30	3.3737	.49563	.09049	3.1886	3.5587	2.22	4.00
5 or more years	30	3.7140	.58749	.10726	3.4946	3.9334	2.37	4.81
Total	150	3.4994	.69649	.05687	3.3870	3.6118	2.00	5.00

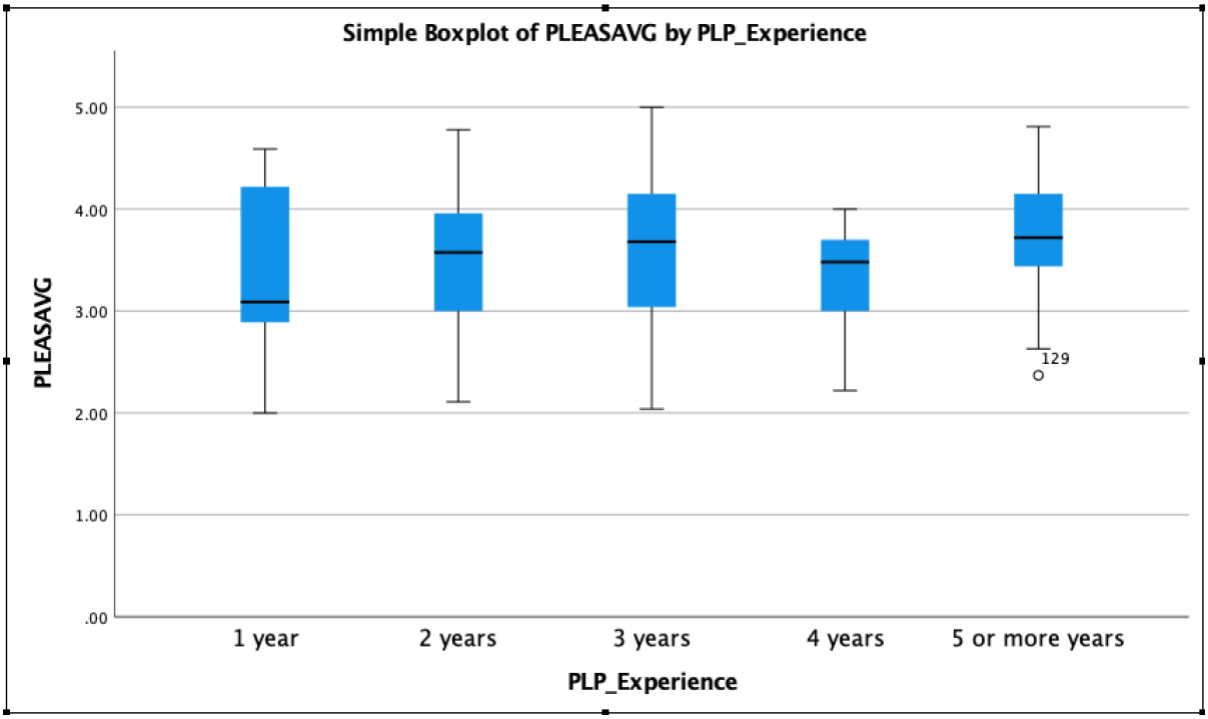
Results

Data Screening

Data screening was conducted on the dependent variable, teacher attitudes, for each group, PLP years of experience. The researcher examined the data and scanned for inconsistencies. No data errors or inconsistencies were identified. Box and whisker plots were used to detect outliers on the dependent variable. No extreme outliers were identified. See Figure 1 for the Box and Whisker Plots.

Figure 1

Box and Whisker Plots



Assumptions

An Analysis of Variance (ANOVA) was used to test the null hypothesis. The ANOVA required that the assumptions of normality and homogeneity of variance were met. Normality was examined using a Shapiro-Wilk test. Teacher attitudes were normally distributed, as assessed by the Shapiro-Wilk's test ($p > .05$). See Table 4 for Tests of Normality. As demonstrated in the table, all p values in the significance column were above .05; therefore, no violations of normality were found.

Table 4

Tests for Normality

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	PLP_Experience	Statistic	df	Sig.	Statistic	df	Sig.
PLEASAVG	1 year	.152	30	.076	.932	30	.057
	2 years	.135	30	.171	.967	30	.459
	3 years	.090	30	.200*	.969	30	.514
	4 years	.129	30	.200*	.936	30	.069
	5 or more years	.087	30	.200*	.979	30	.803

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The assumption of homogeneity of variance was examined using the Levene's test. There was heterogeneity of variances, as assessed by Levene's test of homogeneity of variances (p = .012). For assumptions to be met, p must be greater than .05. See Table 5 for tests of homogeneity of variances.

Table 5

Tests of Homogeneity of Variances

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
PLEASAVG	Based on Mean	3.335	4	145	.012
	Based on Median	2.610	4	145	.038
	Based on Median and with adjusted df	2.610	4	132.022	.038
	Based on trimmed mean	3.387	4	145	.011

Results for the Null Hypothesis

Because the test of homogeneity of variances violated the assumptions, the researcher used a modified ANOVA inferential statistic, called the Welch-ANOVA, considered to be a robust test of equality of means. The difference between the groups was not found to be statistically significant according to the Welch-ANOVA, Welch's $F(4, 71.763) = 1.704$, $p = .158$.

The Welch-ANOVA was used to test the null hypothesis about teacher attitudes toward personalized learning plans by teachers with one, two, three, four, and five or more years of PLP experience. The group means were not statistically significantly different ($p > .05$) and, therefore, this researcher failed to reject the null hypothesis. See Table 6 for the Robust Tests of Equality of Means.

Table 6

Robust Tests of Equality of Means

Robust Tests of Equality of Means

PLEASAVG				
	Statistic[a]	df1	df2	Sig.
Welch	1.704	4	71.763	.158

a. Asymptotically F distributed.

The partial eta squared (η^2) is equal to .036. This represents a large effect size and, therefore, represents an estimate in close proximity, ruling out chance as a reason for the results. See Table 7 for Tests of Between Subjects Effects.

Table 7

Tests of Between-Subjects Effects

Tests of Between-Subjects Effects

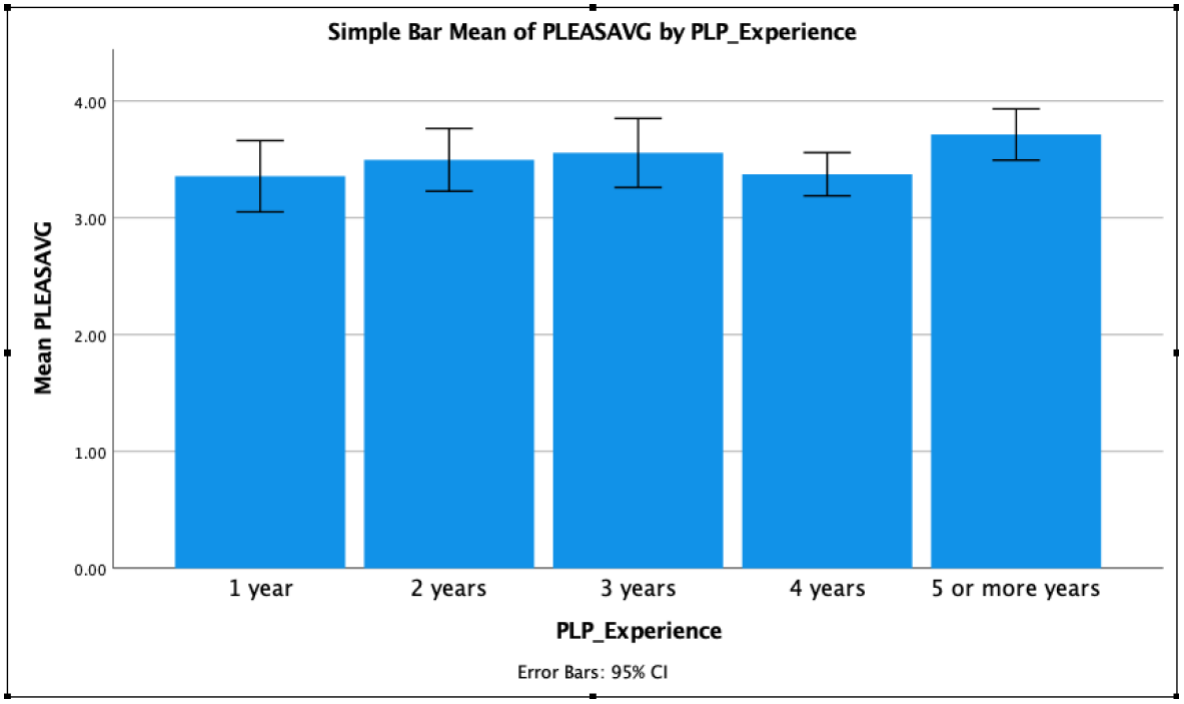
Dependent Variable: PLEASAVG						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2.567[a]	4	.642	1.335	.260	.036
Intercept	1836.870	1	1836.870	3820.682	<.001	.963
PLP_Experience	2.567	4	.642	1.335	.260	.036
Error	69.712	145	.481			
Total	1909.149	150				
Corrected Total	72.279	149				

a. R Squared = .036 (Adjusted R Squared = .009)

The null hypothesis was not rejected at a 95% confidence level. See Figure 2 for the bar graph representing the confidence intervals between the five independent variable groups.

Figure 2

Bar Graph



CHAPTER FIVE: CONCLUSIONS

Overview

The purpose of this study was to identify the overall attitude of Vermont K-8 teachers regarding student personalized learning plans. This chapter includes discussion of major findings relating to the literature on personalized learning plan implementation in K-8 classrooms and relevant teacher attitudes, the limitations of the research, and the implications thereof, that would be valuable to administrators, professional development coordinators and creators, educational institutions, and teachers. The chapter concludes with a section devoted to suggestions for further research should others choose to look at PLP implementation attitudes and how this impacts teachers and students. This chapter includes discussion, implications, and suggestions for further research toward answering the research question:

RQ1: Is there a difference between teacher attitudes toward student personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale?

Discussion

At its core, personalized learning places students at the center of the environment and classroom. Perhaps the largest challenge about studying personalized learning was the sheer number of philosophies where no one philosophy proves more effective than the next. While there was not a solely agreed upon definition or even a singular model for personalized learning, there were two central themes in the literature, and, nearly, every theory: the teacher's role must transition from lecturer to guide, coach, and facilitator, and students must be at the center of the learning. True of any study that depends on individuals, unique subjects mean constantly changing subjects which gives way to a tendency of change in the research.

Personalized learning focused primarily on altering traditional roles in the classroom of the teacher and the student. Due to the nature of that shift, the researcher credited it as a major interest to determine what teacher attitudes were to personalization implementation in the classroom. Consider the various role shifts for a teacher. Bruner (1961) believed that it was the teacher's responsibility to give the students a firm grasp on material, making him a self-sufficient and driven thinker. Through this study, teachers were given the opportunity to evaluate their own practices and provide feedback in relation to their own likes or dislikes of personalized learning plan implementation.

Piaget (Hyde, 2015) also believed that the teacher's role needed to change from lecturer to guide or coach. Teachers, freed to focus on building rapport with students, to share experiences and interests, can participate in guiding and coaching learning connections and experiences. Dewey and Rousseau (Shulman, 2016) stressed the importance of students' experiences, interests, and constructing their own learning, with the teacher's role as limiter, to restrain students from learning experiences beyond their capabilities. The teacher's responsibility was described as guiding students' experiences and interactions, making connections from their daily lives to the lessons and material, without the use of traditional textbooks but using quality curricula and framework. Papert (Tangdhanakanond et al., 2006) believed in the importance of teachers guiding students' goals indirectly and ensuring that the students had access to a high-quality classroom learning environment, materials, peer discussions, and projects. Teachers were facilitators for actions and interactions that helped the students construct their learning. Kolb believed that teachers were guides for group and peer interactions and involved in hands-on, personally tailored activities to student needs, interests, and learning styles (McCarthy, 2016). One more role for the teacher was to listen, to conference

with students and provide feedback on student work, as identified by Calkins (Ball, 2017) as conferring.

Using the relevant literature, the researcher identified essential aspects to personalized learning to consider in the Personalized Learning Environment Attitude Scale survey. The scale sought teacher opinions on whether students were considered central in their learning and how that impacted achievement and learning opportunities. A mean score of 3 or higher indicates a favorable attitude toward personalized learning plans. High averages of teachers believed that students in personalized learning environments learned in comfortable and effective ways (mean = 3.7), had access to a wide variety of learning materials (mean = 4.3), had fun in unique environments (mean = 3.7), increased their self-confidence (mean = 3.9), took responsibility for their learning (mean = 3.6), created learning experiences based on their interests (mean = 3.8), and improved and developed their creative thinking skills (mean = 3.6). While all of the questions had answers leaning with favorable averages, there were some considerations that had averages treading a lower line. Fewer teachers diverged from the moderate views that students could learn at anywhere or anytime (mean = 3.5), that all students were afforded equal opportunities (mean = 3.4), that learning took place at appropriate speeds and with flexible learning times (mean =3.5) , that students increased their problem-solving skills (mean = 3.5), that students conquered learning deficiencies (mean = 3.3), learned according to a variety of learning modalities and methods (mean = 3.5), or accessed learning easily and quickly (mean = 3.3). Less teachers were confident that personalized learning environments prepared students to pass (mean = 3.1), neither did they feel personalized learning plans used the student's time effectively (mean = 3.2). Mean scores for each question can be found in Appendix B alongside the PLEAS instrument.

Before conducting the survey, this researcher sought to answer whether Vermont K-8 teachers had generally favorable attitudes toward personalized learning plans based on their years of teaching experience using the PLEAS.

$H_0$1: There is no statistically significant difference between teacher attitudes toward personalized learning plans for Vermont K-8 teachers with one, two, three, four, and five or more years of experience as shown by the Personalized Learning Environment Attitude Scale.

After analyzing the results using SPSS software, the research failed to reject the null hypothesis. There was no statistically significant difference in teacher attitudes toward PLPs for Vermont K-8 teachers in any of the categories. Statistical significance was not found; therefore, indicating that, if applied to the general population of K-8 teachers, one would find attitudes toward PLP implementation leaning largely favorable on average, both for teaching experience—highest in the newest teachers (mean = 3.7), with a gradual decrease as years of experience increased, and PLP implementation experience. The overall PLEAS score leans favorable in every group, though it is highest in those with 2-, 3-, and 5- years of experience (means = 3.9), and those teachers that are newest in their field (mean = 3.7), and highly educated (mean = 4.0), evidenced by the mean scores.

Implications

With significant gaps in the literature about personalized learning plans, this study served to bridge the gap a little more. This researcher chose to focus on teacher attitudes toward PLP implementation because of the gap in literature surrounding this topic. It has not been widely researched. Teacher comfortability and confidence plays a great role in PLP implementation—as in any area of strategies and tools used in the classroom. Getting teacher feedback, then, should be essential in weighing teacher attitudes and effectiveness in PLP implementation. This

study served to get teacher feedback on PLP implementation and resulted in overall favorable attitudes.

The research that does exist on the topic references technology advancements, the use of Individualized Education Plans (IEPs), educational reform across the board, and the importance of high-quality professional development. Technology has continued in its advance for helping chart and track student goals, interests, and progress. These technological tools have aided teachers as they plan and implement PLPs. Where there is greater personalization, individualized instruction, and where students have greater control over their learning, then there may be a lesser gap in student success and learning because students have the opportunity to voice their interests and areas where they need help.

Knowledgeable administrators are likely to encourage professional development in using these tools toward goals of personalization to elevate student achievement, yet this is not always the case. One could suggest that the lack of high-quality professional development for teachers is one reason why many teachers stand on the middle ground of PLP implementation. For example, the discovery learning model failed to provide a framework of instruction, and teachers must attempt to facilitate PLPs for students, which was limiting and leaned toward low-quality models. There was also a severe lack of guidance in this model which proved overwhelming. When teachers are overwhelmed or unsure, it appears that they either do not implement the strategy or model, implement with low-quality, or implement it weakly, yet, to the best of their ability, and all of these lead to generally unfavorable attitudes.

Receiving feedback suggesting that most teacher attitudes toward personalized learning plans are favorable in K-8 classrooms in Vermont was highly encouraging and somewhat reassuring that Vermont was on the right track to ensuring a successful, individualized education

for students. There was still great room for improvement in this aspect of teaching strategy and student learning. Teachers that have been in a classroom for 4-6 years had a slightly lower average (mean = 3.8) than those that were newest in the field (mean = 4.1). It could be that the professional development offered to them failed to address their own experiences and knowledge in the classroom while implementing PLPs. It could also suggest that, for those with less favorable attitudes, their comfortability or confidence was low regarding PLP implementation. It was also possible that as time passes these teachers realized that PLPs were not as effective as promised in bridging the achievement gap which could be an opportunity for further research.

With a moderate line of favorability, professional development coordinators and administrators have a guiding force in improving upon PLP implementation and ample room for growth. With high-quality, engaging, academically challenging, motivational, focused, collaborative, and personalized learning for teachers, meaningful learning would take place and teachers could then implement the same kind of learning in the classroom (McDonough, 2014, p.14). Modeling was proven to be an effective educational strategy, and it would seem that many teachers crave a hands-on approach to their own learning, especially regarding something they must do in the classroom for their own students. Professional development should target new teachers since their attitudes toward it seemed to be least favorable. As this initiative becomes common practice, it is important to ensure that it is not assumed that new teachers know how to implement student PLPs. It must be embedded in new teacher orientation and through the use of an experienced mentor.

It could also be stated that observations and analyses of the data need to prove the benefits of personalized learning plans in the classroom and be shared with educators. To have four-years of experience with PLP implementation, and have one of the lowest averages (mean =

3.4), seemed to imply that one lacked confidence or comfortability. Either quality PD was not being offered, or data were not convincing the teacher that it was worth their time. Perhaps, data team meetings should be formed to study how PLP impacts student achievement and success. It would appear that there was a slight disconnect between year 2 (mean = 3.5), year 3 (mean = 3.6), and year 4 (mean = 3.4) teachers—the gap itself and differences in PLP implementation attitude seemed to indicate a less unified approach to learning. These data team meetings should be across the grade-levels. This will ensure that the child's personal needs are met based on the learning he has previously accomplished. It would also consider the goals he is striving toward now and in the future.

Limitations

There were several limitations within this study and surrounding this study to include optional demographic data, researching only Vermont educators, not soliciting high school teacher input, and not soliciting student voice whatsoever. Not requiring all demographic data and not soliciting high school teacher input were weaknesses within this study and could have threatened the internal validity of the results. Researching only Vermont educators and not soliciting student voice were weaknesses surrounding this study and could also have threatened the external validity of the results.

The demographic data that was provided through the survey was adequate, but it missed the opportunity to look in depth at the various demographic groups for more comprehensive data examination. For example, only 140 out of the 150 reported their education. It begs the question that if all participants reported their education, would there have been statistical significance?

There were two reasons for researching Vermont only teachers. The researcher was a Vermont educator, so the connections were very convenient. Secondly, there were not too many

other states who were requiring Personalized Learning Plans. The topic was highly under-researched, and the data sparse. Even in Vermont, there were not data to support that all schools were implementing personalized learning plans though it was a law for grades 7-12.

After reviewing Act 77, described in the literature review, the law only required personalized learning plans for grades 7-12. Instead of only asking K-8 teachers to participate in the study, it would have been to the advantage of the researcher to solicit 9-12 teachers as well. There would likely have been an opportunity to have hundreds more participate in the study and provide an increase in data validity. The study may have provided different results with a larger variety of teachers.

Lastly, the study focused on teachers attitudes only. Yes, teachers were the ones teaching and implementing the personalized learning plans, but students were the ones who must construct them. Vermont students were required to have personalized learning plans in order to graduate from a Vermont school. What were their attitudes toward them? Did they value the plans enough to personalize their education? One hope of the plans was that students could monopolize on their high school education to prepare them for the rest of their lives. The researcher could have taken advantage of comparing teacher attitudes and student attitudes.

Recommendations for Further Research

With many gaps in the literature, there were many questions that still needed answering. These included areas of professional development, student achievement, and other states' implementation of personalized learning plans. One challenge was the underwhelming amount of literature and research surrounding PLP implementation and student achievement. There was little research and data on professional development for PLP implementation. There was also a lack of resources available to test teacher attitudes, success, student attitudes and achievement,

and administrator's and professional development coordinator's goals and favorability. There was a wealth of foundational framework surrounding the general idea of personalization, in the way of educational theories, and yet a wide gap in the literature. There was also, potentially, a lack of research into professional development methods for teachers that were implementing personalized learning plans.

Because personalized learning plans were still being newly rolled out in Vermont, there was not enough data to reference as it relates to student achievement and other benefits that personalized learning plans boast to the relevant stakeholders. There are also more stakeholders involved than just the teachers and students, which could pose a challenge in getting appropriate feedback from everyone that PLPs affect.

One might wonder if professional development had been offered to the teachers, if it was personalized for them, and whether the training was high-quality and academically rigorous to inspire meaningful learning. Even if professional development were offered to the teachers, one would need to be able to evaluate what high-quality PD for implementing PLPs looks like. Superintendents and administrators need to ensure that they gave teachers a chance to buy-in to this role transition before pushing another fad with little research, to back up the effectiveness in the classroom.

Buying-in is not enough to ensure that PLP's are the right move. There must also be data to back up the transition. One method used by many schools are data team meetings, where the relevant educators gather to examine the information and insights, track knowledge, student performance and progress, and guide professional development, curricula decisions, and materials purchases. Data team meetings might be an effective way to address student achievement regarding PLP effectiveness. Data could be examined over the course of a

student's learning career to demonstrate whether PLP's are impacting data negatively or favorably. Data teams, while useful, also pose a problem because they require a roll-out of their own. Professional development on PLPs should also include data tracking methods, whether these are data teams or something else entirely, and other feedback protocols for the various stakeholders.

One aspect of feedback that should be considered are self-assessments for teachers as they begin to implement PLPs in the classroom. PLPs really require a paradigm shift in teachers' roles and responsibilities in the classroom. That is a shift that requires focus and self-reflection and analysis. Administrators will likely also want a way to track teacher progress as teachers design personalized learning environments and build a student-centered approach to learning. Assessment strategies on tracking curricula benefits and drawbacks would also be necessary to get a full scope of the impact on student achievement.

While the researcher considered what teachers' attitudes were regarding implementation of PLPs in the classroom, the researcher did not address how these attitudes *affected* implementation of PLPs in the classroom. It is plausible that PLPs were implemented slightly less effectively when a teacher lacked confidence. While student-centered learning takes some of the pressure off of the teacher, learning experiences are guided by the teacher. A lack of confidence could present itself in the way of inadequate learning experiences, a poor learning environment, or missed opportunities for connecting lesson material with students' real lives. A confident teacher likely has built good rapport with the student and can conference effectively and encourage meaningful learning experiences for each student.

As other states implement PLPs, studies should be conducted to compare and contrast the data on all of those fronts as well. It appeared that Vermont rolled out PLPs in an effective

manner considering the favorable attitudes from teachers. Until compared with other states, one would not be able to make further generalizations. It would be wise to consider equitable practices of implementing PLPs in the various states too. Equal opportunity was a weak point as attitudes on the PLEAS survey were not far from the middle ground in favorability.

One could also suggest that a wider population base should be considered. The researcher took data from K-8 teachers, but one could consider teacher attitudes from pre-K and up through 12th grade. There are several studies that have been conducted regarding college professors' use of PLPs. However, one could benefit from considering professors' attitudes toward PLP implementation. Institutionally, it would be important to consider whether colleges honor PLPs and flexible learning pathways. When students have direct control over their learning, constructing their own meaningful learning experiences, it impacts how and what they learn. For institutions, PLPs could impact the accreditation of private schools and even colleges. There are considerations regarding course material and design resting on data tracking procedures and stakeholder opinions.

Another approach to the study could employ qualitative measures such as observation, interviews, case studies, and questionnaires to identify themes in the theoretical research, especially as it relates to strategies on implementing PLPs in the classroom. Qualitative research would allow for broader themes and generalizations of observations of student and teacher attitudes. Having teachers share their views, opinions, struggles, highlights, and low moments anecdotally could provide rich research in an otherwise deficient field.

Conclusion

Personalization has become widely used in Vermont, even legally mandated for 7th through 12th grade. Not only is it a new educational trend, but it is being used to guide student

learning and achievement. Schools are relying heavily upon the impact of increased student interest and engagement in the classroom. With the impactful role changes of the educators in the classrooms, teacher attitudes should absolutely be considered when evaluating the effectiveness of PLPs. Vermont K-8 teachers have largely favorable attitudes toward personalized learning plan implementation as evidenced by this study, and the mean score of 3.5. Further research should be conducted on student voice to include student attitudes toward personalized learning plans.

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APPENDICES

Appendix A

Email Transcripts

requesting permission
to use the PLEAS instrument
between Micah R. Hayre and Muhittin Sahin

Dan Hay Sep 30, 2019

Hi Mr. Sahin,

I am wondering if you would be willing to share with me your survey that you utilized for the Personalized Learning Environment found here: https://files.eric.ed.gov/fulltext/EJ1086195.pdf

I am trying to identify teacher attitudes toward personalized learning environments in Vermont, United States.

Thank you,

Micah Hayre
mhayre@liberty.edu

Muhittin Şahin to you Oct 1, 2019

Dear Hayre,
Hi, I can certainly share the scale form with you. But this form is in Turkish. You can find the scale form. And also if you want I can help you with the translate of the scale form.
Regards,
Muhittin.

Şahin&Kışla .docx

Dan Hay Oct 28, 2019

Hi Muhittin,

I received the survey and it is great. I would like to use it. May I have permission to administer it?

Thanks so much!

Regards,
Micah

Muhittin Şahin to you Oct 29, 2019

Dear Mecah,
Exactly, You can use the scale.
Regards,
Muhittin.

Appendix B

Personalized Learning Environment Attitude Scale

(PLEAS): Personalized Learning Environment Attitude Scale Please answer the following 27 questions from the Personalized Learning Environment Attitude Scale. It is a 5-point Likert scale where 1 means you Strongly Disagree, 2 means you Disagree, 3 means you are Undecided, 4 means you Agree, and 5 means you Strongly Agree.	Mean Score
1. Using personalized learning plans, I believe students can learn in a comfortable way.	3.7
2. Using personalized learning plans, I believe student learning will be effective.	3.6
3. Using personalized learning plans, I believe students can learn anywhere.	3.5
4. Using personalized learning plans, I believe it is important to provide a variety of materials to learners.	4.3
5. I think it is important to support lifelong learning using personalized learning plans.	4.0
6. Using personalized learning plans, I believe students have fun while learning.	3.7
7. I think it is important to reach large masses using personalized learning plans.	3.3
8. I think personalized learning plans ensure equal opportunities in education.	3.4
9. Using personalized learning plans, I believe students are provided an environment that is unique to them.	3.7
10. I think personalized learning plans encourage a learning environment outside of the classroom.	3.8
11. Using personalized learning plans, I believe students learn at an appropriate learning speed.	3.5
12. Using personalized learning plans, I believe students conquer their learning deficiencies.	3.3
13. Using personalized learning plans, I believe students are presented with learning solutions suitable for their learning modality.	3.6
14. Using personalized learning plans, I believe students can learn at any time.	3.6
15. Using personalized learning plans, I believe students can access information easily and quickly.	3.3
16. Using personalized learning plans, I believe students increase their self-confidence.	3.9

17. Using personalized learning plans, I believe students take responsibility for their learning.	3.6
18. Using personalized learning plans, I believe students are well prepared to pass all subjects.	3.1
19. Using personalized learning plans, I believe students can create experiences through their learning.	3.8
20. Using personalized learning plans, I believe students are able to use their learning time flexibly.	3.6
21. Using personalized learning plans, I believe students are able to direct their own learning.	3.6
22. Using personalized learning plans, I believe students get the opportunity to learn what they are interested in.	3.8
23. Using personalized learning plans, I believe students develop their own learning methods.	3.5
24. Using personalized learning plans, I believe students are encouraged to research on their own.	3.6
25. Using personalized learning plans, I believe students use time more effectively.	3.2
26. Using personalized learning plans, I believe students increase their problem-solving skills.	3.5
27. Using personalized learning plans, I believe students improve and develop their creative thinking skills.	3.6
Total Mean	3.5

Appendix C

IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

December 18, 2019

Micah Hayre
IRB Exemption 4076.121819: Teacher Attitudes toward Personalized Learning Plans

Dear Micah Hayre,

The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study to be exempt from further IRB review. This means you may begin your research with the data safeguarding methods mentioned in your approved application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

> (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met:
>
> > (i) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects;

Please note that this exemption only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued exemption status. You may report these changes by submitting a change in protocol form or a new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether possible changes to your protocol would change your exemption status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

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Appendix D

Consent Form

Teacher Attitudes Toward Personalized Learning Plans
Micah Hayre
Liberty University
School of Education

You are invited to be in a research study that looks at teacher attitudes toward student personalized learning plans with respect to years of personalized learning plans implementation. You were selected as a possible participant because you are 18 years of age or older and a Vermont-certified K-8 teacher who has at least one year of experience with implementing personalized learning plans in the classroom. Please read this form and ask any questions you may have before agreeing to be in the study.

Micah Hayre, a doctoral student in the School of Education Liberty University, is conducting this study.

Background Information: The purpose of this study is to see if teachers' attitudes change with years of personalized learning plan implementation experience, perhaps increasing, decreasing, or staying steady with one to five years of experience.

Procedures: If you agree to be in this study, I would ask you to do the following things:

1. Complete an anonymous, online survey. This should take approximately 5 minutes to complete.

Risks: The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

Benefits: Participants should not expect to receive a direct benefit from taking part in this study. A small benefit to society is the allowance of teachers to voice their opinions on the idea of personalized learning plans, implementation, and training.

Compensation: Participants will be compensated for participating in this study. Each survey participant will receive a $5 egift card to Dunkin Donuts. After you click "submit survey," a link to a separate survey will request your name and email address. Once surveys are collected, the participant should expect to receive their egift card via email within two weeks.

Confidentiality: The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records. Participant survey responses will be anonymous. All data collected will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

Conflicts of Interest Disclosure: The researcher serves as a supervisor at Stamford School in Stamford, Vermont. To limit potential conflicts, the study will be anonymous, so the researcher will not know who participated. This disclosure is made so that you can decide if this relationship will affect your willingness to participate in this study. No action will be taken against an individual based on his or her decision to participate in this study.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time, prior to submitting the survey, without affecting those relationships.

How to Withdraw from the Study: If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

Contacts and Questions: The researcher conducting this study is Micah Hayre. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact him at mhayre@liberty.edu. You may also contact the researcher's faculty chair, Dr. Amanda Dunnagan, at ajdunnagan@liberty.edu.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

Please notify the researcher if you would like a copy of this information for your records.

Appendix E

Email sent to the Superintendents

Requesting participants for the study
Between Micah R. Hayre
And the various school district superintendents

Hi Superintendent _____,

My name is Micah Hayre and I am a doctoral student at Liberty University. I am working on my dissertation and would love to collect responses from the teachers in the _____ School District.

The IRB has officially approved my study (approval attached) and the survey has been launched. You will find the survey in the following link, to include the directions and consent form.

Any K-8 teacher who has any experience with personalized learning may participate in the survey. It should take approximately 5-7 minutes. **Every participant will receive a $5 Dunkin Donuts gift card for their participation.**

Please let me know if you have any questions or concerns. I would be so thankful if you would be willing to send this out to the teachers in the _____ School District!

Very Respectfully,

Micah Hayre
Ed.S Educational Leadership

Appendix F

Google Form

Parts 2-5
Created by Micah R. Hayre
Provided via email to teacher-participants

PLEAS Survey

Thank you for participating in the following survey. The first question will be a screening question to make sure you are able to participate in the survey. Then, you will be asked to answer 6 demographic questions. After the demographics, there will be 27 survey questions. Finally, you will be directed to a separate survey to provide your name and email address for your $5 Dunkin Donuts egift card.

Are you 18 years of age or older, and a Vermont-certified K-8 teacher, and do you have at least one year of experience with personalized learning plans implementation? *

- ◯ Yes
- ◯ No

Demographics

What is your gender?

- ◯ Female
- ◯ Male

What category below includes your age?

- ◯ a. 18-29
- ◯ b. 30-39
- ◯ c. 40-49
- ◯ d. 50-59
- ◯ e. 60-69
- ◯ f. 70+

What is the highest level of school you have completed or the highest degree you have received?

- ○ a. Bachelor's degree
- ○ b. Master's degree
- ○ c. Specialist degree
- ○ d. Doctoral degree

How many years have you been teaching?

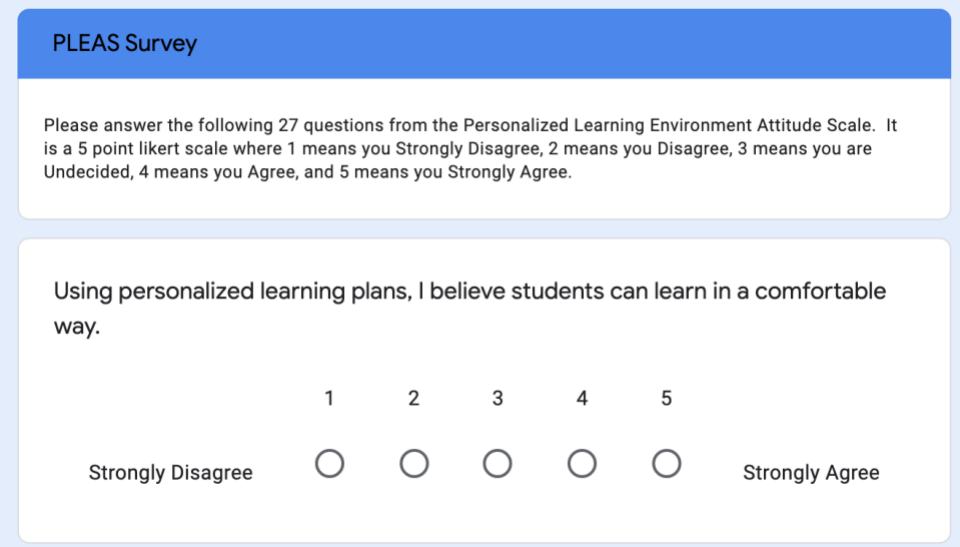
- ○ a. 0-3 years
- ○ b. 4-6 years
- ○ c. 7-9 years
- ○ d. 10-19 years
- ○ e. 20 years or more

What grade level do you currently teach?

- a. Kindergarten
- b. First Grade
- c. Second Grade
- d. Third Grade
- e. Fourth Grade
- f. Fifth Grade
- g. Sixth Grade
- h. Seventh Grade
- i. Eighth Grade

How many years of experience have you had with personalized learning plan implementation? *

- a. 1 year
- b. 2 years
- c. 3 years
- d. 4 years
- e. 5 years or more



PLEAS Survey

Please answer the following 27 questions from the Personalized Learning Environment Attitude Scale. It is a 5 point likert scale where 1 means you Strongly Disagree, 2 means you Disagree, 3 means you are Undecided, 4 means you Agree, and 5 means you Strongly Agree.

Using personalized learning plans, I believe students can learn in a comfortable way.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Thank you so much for your participation. In order to receive your $5 Dunkin Donuts egift card, please click the following link to provide your name and email address: https://forms.gle/DWjtE2Mr9zNDLZ539