sciendo
ExELL (Explorations in English Language and Linguistics)
11.2 (2023): 172-197
DOI: 10.2478/exell-2023-0011
Original scientific article

Resilience in virtual education: Designing and validating a scale in higher education

Afsaneh Ghanizadeh & Maryam Majidi Yazdi

Imam Reza International University, Mashhad, Iran

Abstract

Education for Sustainable Development (ESD) equips learners in all settings with the knowledge, skills, attributes, and visions essential for coping with the diverse challenges they will encounter in their educational endeavors. The emergence of COVID-19 influenced different aspects of human life including education. Thanks to technology, especially ICT, Virtual Education (VE) provides the opportunity to continue education in such crises. Amidst this pandemic, many students, especially university students, encountered various challenges and impediments that resulted from VE. One of the factors which can affect VE is learners' resilience. Therefore, it is of high importance to measure university students' Resilience in Virtual Education (RVE) to recognize the advantages and disadvantages of this type of education and support ESD. The main purpose of this study is to design and validate a comprehensive instrument for measuring university students' RVE. Furthermore, to confirm the validity and reliability of the instrument, its nexus with a closely related construct, i.e., second language (L2) buoyancy was explored. To measure students' RVE, a new scale (RVE Scale), comprising 33 items, was designed. It was designed based on the operational definition of academic resilience and was adapted to accommodate the requirements of VE. It measures six aspects of learners' resilience: emotional, motivational, cognitive, metacognitive, persistence, and sociability. To measure L2 buoyancy, a relevant scale designed by Jahedizadeh et al. (2019) was utilized. It consists of 27 items with four factors; the factors include sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life. A total of 412 university students participated in the present research. The results obtained via Confirmatory Factor Analysis (CFA) substantiated the validity of the newly designed scale and all the factors and items. The results attested to the criterion-related validity of the scale.

Key words: buoyancy; higher education; resilience; virtual education.

1. Introduction

The emergence of COVID-19 posed serious challenges for all countries. According to WHO (2020), COVID-19 drifted quickly around the globe and influenced every nation directly or indirectly. Stringent Public Health and

Social Measures (PHSM) comprising restrictions on national and transnational travel; the closure of schools, public places, and other measures were carried out by all nations to decelerate the circulation of COVID-19 (WHO, 2020).

Thanks to technology, especially Information and Communication Technology (ICT), Virtual Education (VE) came to the teachers' and learners' assistance and made it possible to continue education. ICT is defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information" (Blurton, 1999: 1). These technologies comprise computers, the Internet, broadcasting technologies (radio and television), and telephony (Tinio, 2003).

VE has both advantages and disadvantages for teachers and learners, especially during the time of pandemics. In addition to the benefits like flexibility in time and location, autonomous learners, etc., lack of interaction, inequalities of digital devices, faults in ICT infrastructure, digital illiteracy, and endangered mental health have been reported as some instances of the problems related to VE (Mozafari et al., 2023). To effectively cope with these adversities, learners' resilience can be a critical factor. In academic settings, resilience is conceptualized as the increased probability of successful functioning in school and other life circumstances despite contextual hardships and obstacles (Wang et al., 1994).

Academically speaking, resilience is closely aligned with the concept of buoyancy, and they are even applied interchangeably (Jahedizadeh et al., 2019). Academic buoyancy is "students' ability to successfully deal with academic setbacks and challenges that are typical of the ordinary course of school life (e.g., poor grades, competing deadlines, exam pressure, difficult schoolwork)" (Martin & Marsh, 2008a: 54). Academic resilience and buoyancy pertain to learners who should resolve the ebb and flow of daily academic experiences and sustain their confidence and determination despite the hindrances (Martin & Marsh, 2009). If the cross differences between the two are detected, it is then likely that academic buoyancy is a prerequisite but not entirely adequate for academic resilience; therefore, it is probable that resilient learners are correspondingly buoyant (Martin & Marsh, 2008a).

Based on what was mentioned about the contribution of resilience to effective academic functioning and the need to operationalize the construct in the avenue of the complicated problems instigated by VE, the present study endeavored to design and validate a relevant scale for measuring Resilience in Virtual Education (RVE).

2. Review of the related literature

2.1. *Resilience*

Resilience is conceptualized as "the capacity to bounce back, to withstand hardship, and to repair yourself" (Wolin & Wolin, 1993: 5). It is also defined as the procedure of, capability for, or consequence of effective adjustment despite tedious or demanding conditions (Masten, 2001). Schelvis et al. (2014) delineated three facets of resilience as follows: alteration and adjustment, adaptability and renovation, and self-efficacy in one's belief to cope with the challenging situation. Hence, at the heart of resiliency is the potential capability to be adaptable to cope with adverse or unwanted circumstances (Ghanizadeh et al., 2019).

Resilience shows up when individuals have moderately good outcomes despite various sources of anxiety and tedious circumstances, and their achievement is more satisfactory than that of peers undergoing similar circumstances (Rutter, 2013). Resilience is usually conceptualized in the light of risk and protective factors. Risk factors are the features which lead to unsatisfactory consequences and protective factors are the elements which encourage satisfactory outcomes (Reis et al., 2004).

2.1.1. *Academic resilience*

When resilience is operated in the context of education, it takes a multidimensional nature. It encompasses both emotional well-being, such as manipulating stress in adversities, and academic performance, such as handling disappointment when working on a tough task (Whatman et al., 2020). When a learner demonstrates an optimal level of academic performance despite adversities or hindrances, s/he is typically considered to be academically resilient (Araghian & Ghanizadeh, 2021).

The notion of "academic resilience" should not be perceived as a static characteristic, it can be developed by focusing on malleable factors which can affect a person's success in school (Waxman et al., 2003). Among the empirical research concerning academic resilience, Martin and Marsh's (2006) research suggested a 5-C model of academic resilience: confidence (self-efficacy), coordination (planning), control, composure (low anxiety), and commitment (persistence). Their study revealed that academic resilience afterward can result in a number of emotional and individual consequences, including self-efficacy, engagement, and enjoyment.

Araghian and Ghanizadeh (2021) in an exploratory study across the academic domain reported that resilience can have two core dimensions: proactive and retroactive, each associated with many components, such as moti-

vation, adaptability, self-efficacy, commitment, deep learning, and engagement.

Among the recent studies on academic resilience, Kim and Kim (2017) studied the construct among second language (L2) learners. They examined the association between resilience, motivated-inspired behavior, and English learning. To do so, they designed a questionnaire measuring resilience via five sub-scales: perceived happiness, empathy, sociability, persistence, and self-regulation. It was indicated that among the factors, persistence displayed the highest impact on English proficiency. Persistence demonstrated the highest predictor power for motivated behavior and English learning.

Another study explored resilience in alignment with English as a foreign language (EFL) students' Personal Best (PB) goals and language achievement (Najafzadeh et al., 2018). The outcomes of Structural Equation Modeling (SEM) exhibited that PB positively predicts resilience. Furthermore, it was reported that language learning is influenced by both resilience and PB. Academic resilience has also been found to be associated with mindfulness, self-fulfillment, and motivation (Ghanizadeh et al., 2019).

2.1.2. *Academic resilience and coronavirus*

With the appearance of COVID-19, different investigations were carried out about the attributes which facilitate students' academic and social functioning. Among these attributes, a number of studies delved into learners' resilience in this crisis. For example, a study compared student attitudes towards digital literacy, self-efficacy, and resilience in times of COVID-19 through information collected from 687 tertiary students from Australia, Cambodia, China, India, and Malaysia. The study attested to cross-cultural variations across these nations in their resilience and digital literacy (Eri et al., 2021).

Another study conducted by Hatlevik and Bjarnø (2021) investigated the extent to which notions, such as resilience to digital disruptions, ICT self-confidence, and motivation, are linked to student teachers' strategies and time management for learning and studying. It was found that student teachers' resilience to digital distractions and their motivation were linked to their learning strategies and time management. This study highlighted the contribution of equipping learners with resilience to digital disruptions to enhance effective learning and self-regulation.

Believing that during the tedious time of the COVID-19 pandemic, resilience at the individual level could not adequately respond to all the hardships and unexpected circumstances, Nandy et al. (2021) proposed a comprehensive model of resilience integrating individual resilience into organizational resilience. In a similar vein, Tang (2020) put forward a composite model of resilience, incorporating the classic resilience model competition

facets and organizational burnout. This model will help HEIs (higher education institutions) to prosper in the recovery period. Their proposed model is expected to provide constructive guidelines for post-COVID educationalists in making improvements at the institutional level as well as the individual level.

Another research conducted by Brammer (2020) analyzed the effect of the coronavirus pandemic of 2020 on first-year graduate students' resilience. Brammer concentrated on three questions associated with a specific area. Answers to the three questions were coded, and categorized, and, accordingly, the predominant themes emerged. The main themes comprised time management, social interaction, physical/mental well-being, and adaptability. The results show that students indicate traits of resilience.

Serrano et al. (2021) did a study and explored self-perceived resilience in a number of higher education students experiencing COVID-19 quarantine. The findings indicate that a high degree of resilience among higher education students can be detected, regardless of their socio-demographic characteristics. A higher level of resilience was reported for male students and those over 25. Moreover, students who lived alone or moved from their parents' homes displayed a higher self-perceived resilience. The academic major was another feature influencing a higher resilience among higher education students. For instance, health science students identified themselves as more motivated to adjust to new conditions, resolve challenges, and bounce back from hardship.

Another study conducted by Quintiliani et al. (2022) had the aim to explore psychological anxiety, affective fluctuations, learning approach, and resilience in nexus with the occurrence of the COVID-19 pandemic among Italian university students. The students answered an online questionnaire package. It was found that skills associated with resilience skills facilitated effective coping with the impact of stressful circumstances, especially the COVID-19 impact on education and social relations. The research indicates a psychological effect of the COVID-19 emergency on college students. They concluded resilience can be a protective attribute in overcoming the potential problems that penetrated higher education as a result of the COVID-19 pandemic (Quintiliani et al., 2022).

The role of academic resilience in predicting two motivational and attitudinal constructs, namely grit and positive orientation, and the projection of all these variables in accounting for the university students' academic performance in the middle of COVID-19 was the focus of another study (Ghanizadeh, 2022). A total of 521 Iranian university students participated in an online survey. The findings of SEM indicated that resilience accounted for higher levels of grit and positive orientation. Correspondingly, resilience

anticipated academic performance directly and indirectly through its effect on positive orientation and grit (Ghanizadeh, 2022).

2.2. *Academic buoyancy*

As already stated, buoyancy is a construct, which is closely associated with resilience, in that both refer to learners' reactions to daily complications, entailing proactive rather than reactive approaches to educational hardships. In Martin and Marsh's study (2008a), 598 students rated their academic buoyancy in addition to a set of presumed forecasters (self-concept, regulation, educational involvement, stress, and student-teacher rapport). They noted that the highest divergence in academic buoyancy was accounted for at the student level, and stress predicted academic buoyancy to a great extent.

Martin and Marsh (2009) maintained that academic resilience and academic buoyancy are closely related, whilst they need multidimensional methods for their conceptualizing and assessment to distinguish clearly the factors which are (and are not) components, sources, associates, and resemble them. They developed the notion of 'leading' and 'lagging' indicators of buoyancy and resilience.

Martin and Marsh's study (2008b) carried out a psychometric analysis of buoyancy in the context of schools from a construct validity perspective. A number of high school students and staff were assessed according to Buoyancy Scale. The results confirmed the postulated factor model of the scale for staff and learners and the factor analysis attested to the resemblance of the attribute across samples. It was also found that males tend to have higher buoyancy in both groups, although reverse age influences were detected with greater buoyancy among younger students and older staff.

The aim of Jahedizadeh et al.'s (2019) study was to design a specialized instrument for measuring EFL students' academic buoyancy and to examine the relationship between academic buoyancy and three student attributes, including their academic attainment, educational level, and gender. For this purpose, a questionnaire containing 27 items was developed, assessing four dimensions of L2 buoyancy: sustainability, regularity adaptation, positive personal eligibility, and positive acceptance of academic life. The findings exhibited that positive personal eligibility and positive acceptance of academic life predicted EFL learners' academic attainment.

3. Aim of the study

In response to COVID-19 restrictions, various universities across the world adhere to UNESCO's guiding principle for VE. Accordingly, university stu-

dents have been facing a profoundly varied situation about their education as well as their overall lifestyle (Ghanizadeh, 2022). Lockdowns, restrictions, social interaction constraints, and a drastic change in conventional educational activities gave rise to multidimensional anxiety, tension, ambiguities, and psychological well-being problems for learners and teachers around the globe (UNESCO, 2020). Harmonizing personal and academic responsibilities in these unfamiliar circumstances would pose a strain on university students (Ghanizadeh, 2022). University students are potentially confronted with social anxiety, hopelessness, being overwhelmed, time management, budgeting, and many other problems pertaining to the transition to university life. These challenges by default would be more tedious in VE or blended learning. The coping strategies individuals would adapt to cope effectively with these stressful situations play a critical role in academic success (Nazari et al., 2023). The adaptation of effective coping strategies entails students' resilience to endure hardship and maintain ideal degrees of achievement motivation in the wake of stressful circumstances. Nevertheless, university students' RVE, especially at the time of COVID-19, has not received ample consideration. The main purpose of this study is to design and validate an instrument for measuring university students' RVE.

4. Method

4.1. *Participants*

A total of 412 students (259 females and 153 Males) from two universities participated in the present research voluntarily. The sample, which was according to convenience sampling, includes students of different ages (from 19 to 40, M=23.56, SD=5.62) and levels of English language proficiency. They were all university Bachelor's degree or Master's degree students in English teaching and English translation.

4.2. *Instruments*

4.2.1. *EFL learners' RVE scale*

To measure EFL learners' RVE, a questionnaire was designed. It was designed based on the operational definition of academic resilience and was adapted to accommodate the requirements of VE. Furthermore, the academic resilience scale designed by Kim and Kim (2017) was consulted; two of its subscales (persistence and sociability) overlapped with those of RVE.

So, derived from the conceptualizations of academic resilience and based on the factors extracted from the Kim and Kim (2017) scale, the researchers designed the primary version of the RVE Scale (RVES). They then made the

required adaption to make it appropriate for the context of the study, which is VE. In so doing, the researchers made use of their own experience as instructors and educational decision-makers amid COVID-19 VE. They also interviewed two other university professors to generate ideas for adapting the resilience scale for VE.

The developed scale comprised 33 items which measure six facets of this construct. These sub-factors are as follows: Emotional (8 items), Motivational (6 items), Cognitive (6 items), Metacognitive (5 items), Persistence (4 items), and Sociability (4 items). The first factor is related to emotions and feelings which learners experience when learning through VE, such as anxiety, depression, worry, etc. The second factor is concerned with their motivation for learning English, including the level of their enthusiasm, hope, struggle, competition, and other factors. The cognitive factor refers to the extent that learning is accomplished when VE provides some opportunities and obstacles for learning. The metacognitive factor is relevant to learners' self-regulation, their ability to adapt themselves to new situations, their capacity to act as autonomous learners, and plan efficiently, and so on. The fifth factor is persistence which shows that resilient university learners in VE are likely to continue their efforts to solve problems in the face of difficulties. The last factor, sociability, is relevant to learners' social relationships with each other and their teacher; in addition, this factor refers to the capacity of VE for humanizing the classes.

Given that the scale was to be distributed among university students majoring in English, the items were written in English. To achieve more reliable data, 19 items out of 33 items were reverse-coded (as marked in the questionnaire attached in the appendix). In particular, reverse coding was employed to reduce the effects of social desirability as well as measurement errors or inconsistencies. This questionnaire is a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). The total score of 33 items was calculated and considered as the value of the EFL learners' RVE. To put it in other words, the higher the value is, the higher the level of RVE is.

To ensure the content validity of the scale, it was scrutinized for comprehensibility and vividness of the items by two educationalists, two statisticians, and four MA university students.

Sample items for each sub-factor are as follows:

Emotional (e.g., "In VE, I feel anxious when I cannot connect to the class website, especially at the time of exam" (Reverse-coded)),

Motivational (e.g., "There is more intense competition between the learners in the traditional classes in comparison to virtual ones" (Reverse-Coded)),

Cognitive (e.g., "In VE, I find it easier to ask my teacher a question, answer a question, check notes, collaborate and interact with my classmates to solve a problem, etc."),

Metacognitive (e.g., "In virtual classes, I act as a more autonomous learner, and such classes are more learner-centered"),

Persistence (e.g., "When I have a problem in VE, I try to solve it after reflecting on the cause of the problem").

Sociability (e.g., "Since there are no face-to-face classes in VE, it cannot properly humanize the classes" (Reverse-coded)),

4.2.2. *EFL students' academic buoyancy*

For cross-validation of RVES, it was administered to the participants concurrently with the buoyancy scale. To assess L2 buoyancy, a questionnaire designed by Jahedizadeh et al. (2019) was employed. It consisted of 27 items with four factors: sustainability (7 items), regularity adaptation (4 items), positive personal eligibility (8 items), and positive acceptance of academic life (8 items). A five-point Likert scale was used with the following rating system: "definitely disagree" (1) to "definitely agree" (5). The examples were as follows: "I have enough energy to do what I have to do, for example, the homework that the teacher assigns" and "I can usually look at a situation in a number of ways, for example, positive aspects of homework, exams, and teacher rigidity, not just the negative sides." The translation of scale into Persian and its validation in the Iranian context was accomplished by Jahedizadeh et al. (2019). The validity of fit indices were: the $\chi 2$=1,982.64, df=718.23, RMSEA=0.062, GFI=0.68, NFI=0.80, CFI=0.80. The reliability of the questionnaire estimated via Cronbach's α was 0.83. The reliability of each subscale was as follows: sustainability (0.52), regularity adaptation (0.67), positive personal eligibility (0.79), and positive acceptance of academic life (0.69).

4.3. *Procedure*

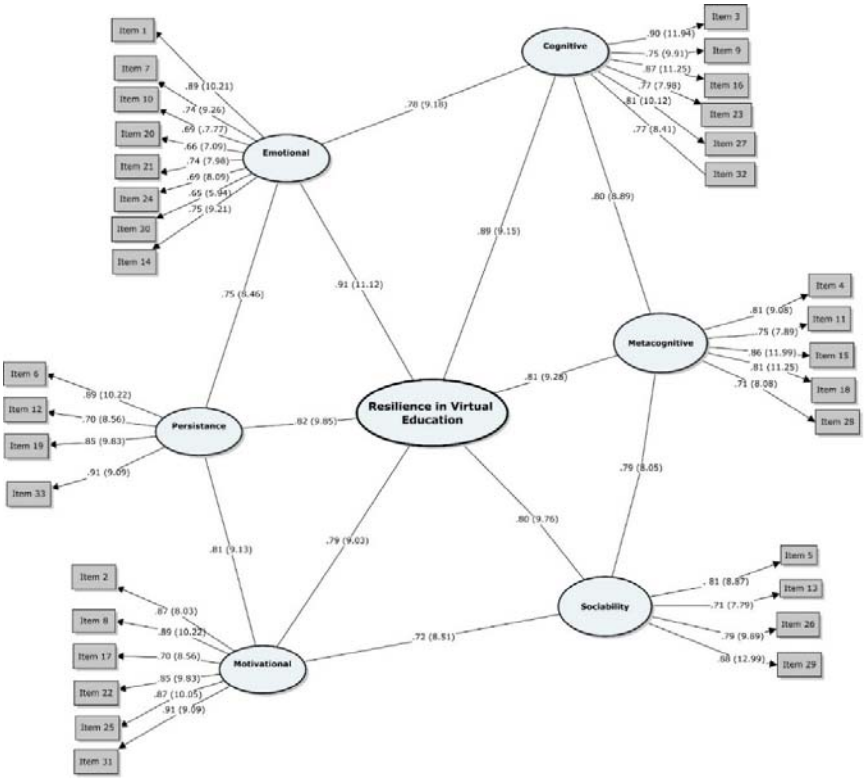
To collect data at the time of COVID-19, the process of giving questionnaires to the participants and completing them was accomplished following hygiene protocols. The participants were requested to fill out the questionnaires carefully. First of all, they were asked to write their demographic information such as Grade Point Average (GPA), age, gender, major, level of education, level of English language proficiency, etc. To achieve accurate and reliable data, anonymity was of high importance and the participants did not need to mention their names. Having made the required arrange-

ments several weeks before collecting data, the very process of data collection took three days (from December 3rd, 2022 to December 6th, 2022).

To verify the validity of the scale, Confirmatory Factor Analysis (CFA) was employed. To determine the criterion-related validity, the nexus between RVES with the closely aligned scale, i.e., the academic buoyancy scale was examined via SEM.

5. Results

As stated earlier, the scale measures six broad factors: *emotional* (8 items), *motivational* (6 items), *cognitive* (6 items), *metacognitive* (5 items), *sociability* (4 items), and *persistence* (4 items). The designed scale comprising 33 items was administered to the participants. The proposed model was tested via CFA using the LISREL 8.50 statistical package.



$\chi 2$= 614.21, *df*= 299, RMSEA=. 060, GFI= .91, CFI= .90, NFI= .90

Figure 1: The schematic representation of the four factors of RVES and the corresponding items

Several fit criteria were taken into account to determine the appropriateness of the model: the chi-square, the normed fit index (NFI), the comparative fit index (CFI), and the GFI (good fit index), and the root mean square error of approximation (RMSEA). The model is shown in Figure 1. The chi-square statistic was non-significant ($\chi2= 614.21$, $p < .05$) and the ratio of $\chi2/df$ was 2.05, signifying the confirmation of the model. The RMSEA, CFI, NFI, and GFI values were found to be .06, .90, .90, and .91, respectively. The numbers on the lines show the standardized estimates (β) and *t*-values, correspondingly. As demonstrated by the figure, all items displayed a *t*-value higher than 2 and all fitted the paradigm. It was also found that all items enjoyed satisfactory factor loading (above .30).

The results of factor loadings for each item are shown in Table 1 as well. In this table, the emotional factor is represented as EM, the motivational factor as MOT, the cognitive factor as COG, the metacognitive factor as MET, the sociability factor as SOC, and the persistence factor as PER.

Table 1: Factor loadings of each item

Item	β	*t*-value	Factor	**Item**	β	*t*-value	Factor	**Item**	β	*t*-value	Factor
1	.89	10.21	EM	**12**	.70	8.56	PER	**23**	.77	7.98	COG
2	.87	8.03	MOT	**13**	.71	7.79	SOC	**24**	.69	8.09	EM
3	.90	11.94	COG	**14**	.75	9.21	EM	**25**	.87	10.05	MOT
4	.81	9.08	MET	**15**	.86	11.99	MET	**26**	.79	9.89	SOC
5	.81	8.87	SOC	**16**	.87	11.25	COG	**27**	.81	10.12	COG
6	.89	10.22	PER	**17**	.70	8.56	MOT	**28**	.71	8.08	MET
7	.74	9.26	EM	**18**	.81	11.25	MET	**29**	.88	12.99	SOC
8	.89	10.22	MOT	**19**	.85	9.83	PER	**30**	.65	5.94	EM
9	.75	9.91	COG	**20**	.66	7.09	EM	**31**	.91	9.09	MOT
10	.69	7.77	EM	**21**	.74	7.98	EM	**32**	.77	8.41	COG
11	.75	7.89	MET	**22**	.85	9.83	MOT	**33**	.91	9.09	PER

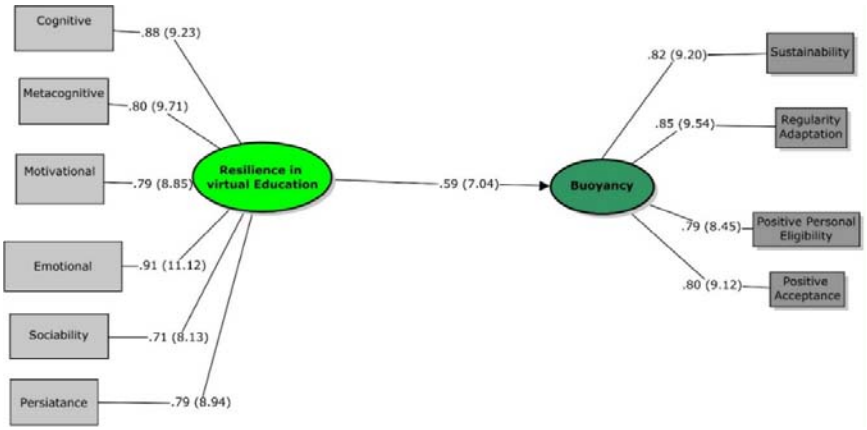
The reliability of the scale estimated via Cronbach's alpha was found to be .88. The Cronbach's alpha estimates for each factor are as follows: cognitive (.79), metacognitive, (.81), emotional (.91), motivational (.90), persistence (.82), and sociability (.89). The correlations among the six factors were then computed. As indicated in Table 2, all the sub-factors highly correlated with each other factor and with the total RVES.

Table 2: The Correlation Coefficients among the Factors of RVES

	1	2	3	4	5	6	7	Mean	SD
1. Emotional	1.00							25.92	4.56
2. Motivational	.66 **	1.00						19.87	2.71
3. Cognitive	.61**	.65 **	1.00					20.41	2.85
4. Metacognitive	.66**	.76 **	.88 **	1.00				16.10	2.35
5. Sociability	.72**	.74 **	. 70**	.66 **	1.00			14.06	2.70
6. Persistence	.66**	. 71**	.78 **	.79 **	.77**	1.00		12.37	2.20
7. RVES	.81**	.80**	.77**	.66**	.64**	.64**	1.00	108.95	9.74

** Correlation is significant at the 0.05 level

To further validate the scale, its nexus with a closely related construct, i.e., buoyancy, was estimated. In so doing, SEM was utilized to assess the model. As demonstrated by Figure 2, the chi-square value (165.12), the chi-square/*df* ratio (2.03), the RMSEA (.062), and the GFI (.92) all reached the acceptable fit thresholds. This implies that the model had a good fit with the empirical data.



$\chi 2$= 165.12, *df*= 80, RMSEA=. 062, GFI=.92

Figure 2: The schematic representation of the model containing RVES and buoyancy

To affirm the potency of the causal links, the *t*-values and standardized estimates were scrutinized. It was shown that RVE positively and significantly anticipated the students' buoyancy (β=0.59, t= 7.04). In other words, the criterion-related validity of the currently-designed scale (RVES) was confirmed.

6. Discussion

As stated earlier, VE has both facilitative and debilitative points. These points can have favorable and adverse effects on learners' emotions, motivation, cognition, metacognition, persistence, sociability, and hence the level of their resilience. Consequently, the level of students' resilience can highly determine their success in VE. Considering the disadvantages of VE, students may encounter different difficulties like emotional and social problems, problems related to learning, planning, adapting appropriately, etc. These complications obstruct students from achieving their educational goals. Because of the mentioned reasons, it is of high importance to measure learner resilience and recognize the strong and weak spots of VE.

Considering the mentioned importance of evaluating learner resilience, the present study aimed at designing an accurate and comprehensive instrument which can evaluate EFL students' RVE in higher education. In addition, the relationship between this construct and their buoyancy was examined in order to confirm the validity and reliability of the instrument.

The results demonstrated that the hypothesized factors (emotional, motivational, cognitive, metacognitive, persistence, and sociability) and the items are valid and reliable. Moreover, the relationship between EFL students' RVE in higher education and their buoyancy was proved to be significant. Therefore, this scale can be used for measuring the level of university students' resilience in the context of EFL and English as a second language (ESL) VE.

In this study, one of the components of RVE is associated with emotions and feelings experienced by students through VE, such as anxiety, depression, worry, etc. It is in line with Fredrickson's (2001) contention that "Positive emotions fuel psychological resilience" (2001: 8). According to Tugade et al. (2004), positive emotions are not only the result of psychological resilience, rather, they play an important role in resilient people's ability to bounce back when encountering stressful situations. Mental well-being is one of the major themes extracted by Brammer's (2020) study which is about student resilience and COVID-19. Moreover, composure (low anxiety) is one of the factors of the 5-C model of academic resilience introduced by Martin and Marsh (2006).

Emotions have a key role in determining learners' attitudes to learning, how they move in the direction of learning, and the level of their attempt to learn. These features allow them to strive for their goals when exposed to some hindrances throughout the process of learning via VE. Therefore, students who feel positive emotions are more likely to become successful in their education.

The second component of RVE is concerned with the learners' motivation for learning English, including the level of their enthusiasm, hope, struggle, competition, etc. The study by Aliyev et al. (2021) indicated that the presence of intrinsic motivation and protective features can be regarded as a requirement for academic resilience. In the second language acquisition (SLA) field, motivation is "the primary impetus to initiate L2 learning and later the driving force to sustain the long, often tedious learning process" (Dörnyei & Ryan, 2015: 72). According to Martin (2014), motivation is the students' feeling which makes them want to learn, their consideration of learning, their energy and determination to learn, their diligent attempts towards academic achievement.

Learners who have a high level of motivation, are more enthusiastic and energetic to learn and compete. When problems obstruct their learning progress, they do not abandon their attempts, instead, they try harder to achieve their academic goals.

The cognitive factor refers to the extent to which learners recognize the adversities and obstacles to learning and try to overcome them to gain more effective learning. It is undeniable that part of the ability to bounce back from the problems associated with VE concerns the identification of the issue and gaining a profound awareness about it. These capabilities fall within the cognitive domain. Previous research corroborated this finding. In their study, Bhaumik and Priyadarshini (2021) introduced cognitively-inspired attributes, such as learner consciousness and autonomy in distance education during the pandemic (COVID-19), as two factors of their online questionnaire which was designed to realize the experiences and resilience of learners of a distance education program during the pandemic.

The metacognitive factor is relevant to learners' self-regulation, their ability to adapt themselves to new situations, their capacity to act as autonomous learners and plan efficiently, etc. It should be mentioned that self-regulation is "the ability to regulate one's thoughts, feelings, and emotions" (Kim & Kim, 2017: 6). In the present study, two items of self-regulation presented by Kim and Kim (2017) were chosen, then they were adapted to VE to design two items out of the five items of the metacognitive factor.

Participants who are motivationally, behaviorally, and metacognitively active in their learning, are self-regulated learners (Zimmerman, 1990). These learners consider learning as a process that is controllable and sys-

tematic, in addition, such learners regard themselves as more responsible for the results of their achievement (Zimmerman & Martinez-Pons, 1990). Zimmerman (1990) stated that self-regulated learners discover a way to become successful in the face of hindrances. It is sensible to say that these learners have a high level of academic resilience. Martin and Marsh (2006) also reported self-regulated planning as one of the factors which forecast academic resilience.

According to Holec (1979), autonomous language learners assume responsibility for the whole of their learning. They do it by determining their goals, describing the contents which they should learn and the course progression, choosing methods and techniques which should be employed in monitoring this process, and assessing the level of their learning Holec (1979). Since autonomous language learners assume responsibility for their learning, when they encounter some complications in the VE context, they attempt to cope with problems, select the procedures and methods which are more appropriate to the new circumstances, and consequently achieve their academic objectives.

Another factor of RVE is persistence. Persistence is the extent to which students continue attempting to comprehend a problem or an answer, even though that problem is challenging or demanding (Martin, 2014). Previous studies also have referred to this factor. Wagnild and Young (1990) identified perseverance as one of the components of resilience. According to them, perseverance is the act of persistence despite difficulty or discouragement. Persistence indicates when resilient L2 learners are faced with troubles they probably continue their struggles to resolve the crisis (Kim & Kim, 2017). To design the items of the persistence factor in the current study, the items of persistence introduced by Kim and Kim (2017) were selected and then adapted to VE. Furthermore, Martin and Marsh's (2006) research proposed a 5-C model of academic resilience including commitment (persistence). As already said, VE causes some challenges and obstacles for learners, and different learners react differently to such problems. In these circumstances, persistent learners react to the complications of learning via VE appropriately and do not give in to them. Hence, they are more likely to develop academically and attain their academic achievement.

The last factor of RVE is sociability. This component is relevant to the learners' social relationships with each other and with their teacher. In addition, this factor refers to the extent to which VE can humanize the classes. This component has been also enumerated in previous resilience studies. For instance, social interaction is one of the major themes extracted by Brammer's (2020) study entitled Student Resilience and COVID-19. Moreover, sociability is considered one of the factors of resilience in Kim and Kim's study (2017). Sociability is a tendency to have a positive relationship with

other persons), and provides different opportunities for learners to know more about their peers' and teacher's attitudes, experiences, feelings, thoughts, ideas, and views related to language learning. Furthermore, learners can talk about their different academic goals and receive their teachers' and peers' opinions on the mentioned goals. Thus, such information gives learners a wider perspective on language learning. Additionally, sociability makes it possible for learners to receive more support and guidance from their teachers and classmates. Therefore, learners with a high level of sociability can successfully deal with different impediments arising in the academic context. More specifically, in VE in the absence of face-to-face interaction, students might need to display more positive relationships with peers and teachers, albeit virtually or via social media.

One of the findings of the present study, which is relevant to the relationship between the EFL learners' RVE and their buoyancy, is in accordance with Martin and Marsh's (2008a) contention that if differences in degree between the two are distinguished, then it is likely that academic buoyancy is a necessary but not enough of a condition for academic resilience, so, it is probable that resilient students are buoyant as well.

Conducting the present research was restricted in some ways. Therefore, addressing them can help provide and develop the future directions of research. First, the data achieved from the sample is not representative of all Iranian EFL learners. To achieve a broader perspective on all of them, a wider sample should be considered. Second, in this study, the data were collected at one point in time. Longitudinal research can throw more light on this construct (RVE) and its constituents. The level of people's resilience changes and managing psychological risks successfully at a particular time of an individual's life does not mean that the person will not respond poorly to other stresses when the circumstances change (Reis et al., 2004). As Rutter (1987: 317) stated, "If circumstances change, resilience alters". Participants of this study were from different social, educational, cultural, and socioeconomic backgrounds, and these factors could influence the level of their RVE. Thus, another limitation is that these factors were not considered in this research.

7. Conclusion

The emergence of COVID-19 as a pandemic focused the attention of all countries and their educational authorities more and more on VE. The central and fundamental importance, prominence, and effectiveness of this type of education were increasingly realized. Students of higher education encountered many challenges and impediments in the course of learning through VE. Moreover, previous studies show that academic resilience has

an impact on learning achievement (e.g., Kim & Kim, 2017; Ghanizadeh, 2022; Najafzadeh et al., 2018), and resilient students have a necessarily high level of buoyancy (Martin & Marsh, 2008a). Therefore, it is of high importance to measure and assess university students' RVE, especially amidst pandemics. Hence, this study has attempted to design an instrument which can evaluate this construct. By applying a useful and practical instrument with the feature of measuring learners' RVE, researchers can do various studies including this construct. Correspondingly, teachers, university administrators, lecturers, authorities, educational planners and policymakers, material developers, and textbook writers can recognize the ups and downs of VE, the level of students' resilience, and the efficiency degree of VE. Consequently, they attempt to maintain and enforce the positive points of VE, solve the related problems, remove the hindrances, etc. For example:

1. Providing the necessary equipment and digital devices for learners who do not have them and making sure all learners have electrical, computer, and internet equipment which is essential for learning.
2. Constructing flawless ICT infrastructure.
3. Teaching computer and internet skills to students and enhancing their digital literacy.
4. Making the recorded video of each session of classes available so the learners who could not connect to the class website and so on, can watch the lessons afterward.
5. Material developers and textbook writers should make the content of books very interesting and more comprehensible.
6. Teachers should explain subjects clearly and in more detail. Moreover, they should make learners more active and dynamic, monitor the learners' progress, ask their questions more carefully, etc.
7. Holding classes which provide the opportunity for teachers and students to interact, exchange their ideas, and express the problems related to VE.

By achieving the above-mentioned aims, a better and more impeccable VE will be created. Furthermore, the learners' ability to regulate their emotions, thoughts, and behaviors, adapt themselves to new circumstances, persist with difficulties, create and maintain positive emotions, consider some motives, act as autonomous learners, and develop social relationships with others can increase the level of learners' RVE as they face problems. University administrators, authorities, educational planners, policymakers, and material developers have a key role in cultivating these capabilities in students. In other words, they should consider the important role of Education for Sustainable Development (ESD). To do so, they should include different strategies and skills related to improving the learners' resilience in the edu-

cational agenda. Teachers should cultivate and develop the learners' abilities which are necessary to enhance their resilience. For example, they should present strategies for autonomy, self-regulation, persistence, adaptation, and so on.

Teachers should provide time for students to express their problems and feelings. They should offer helpful advice and guidance to students. Constructive interaction between teachers, lecturers, and educational policy-makers has an important role in determining, presenting, and expanding better and superior strategies and approaches to enhance the learners' RVE. Learners also play an important role in enhancing their RVE. To do so, they should acquire the essential abilities and practical skills to foster their resilience. In this way, students achieve more success in this kind of education.

References

Aliyev, Ramin, Ufuk Akbaş & Yaşar Özbay (2021). The mediating role of internal factors in predicting academic resilience. *International Journal of School & Educational Psychology* 9: 236-251. https://doi.org/10.1080/21683603.2021.1904068

Araghian, Roya, Afsaneh Ghanizadeh (2021). Teacher resilience: Capturing a multidimensional construct. *TESOL International Journal* 16: 4–55. https://doi.org/tesol-international-journal.com/volume-16-issue-5-2021/

Bhaumik, Rikisha, Anita Priyadarshini (2021). Pandemic experiences of distance education learners: Inherent resilience and implications. *Asian Journal of Distance Education* 16: 18–37. http://dx.doi.org/10.5281/zenodo.5628507

Blurton, Craig. (1999). New directions of ICT-use in education. *UNESCO's World-Communication and Information Report 1999*. Paris: unesco Publishing, 46–61.

Brammer, Mitzi S. (2020). Student resilience and COVID-19. Available at SSRN: https://ssrn.com/abstract=3637824. http://dx.doi.org/10.2139/ssrn.3637824

Dörnyei, Zoltán, Stephen Ryan (2015). *The Psychology of The Language Learner Revisited.* New York: Routledge.

Eri, Rajaraman, Prasad Gudimetla, Shaun Star, Josh Rowlands, Anit Girgla, Loeurt To, Fan Li, Nhem Sochea, Umesh Bindal (2021). Digital resilience in higher education in response to COVID-19 pandemic: Student Perceptions from Asia and Australia. *Journal of University Teaching & Learning Practice* 18. https://doi.org/10.53761/1.18.5.7

Fredrickson, Barbara L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist,* 56(3), 218–226. http://dx.doi.org/10.1037/0003-066X.56.3.218

Ghanizadeh, Afasaneh (2022). Higher education amid COVID-19 pandemic: Contributions from resilience, positive orientation and grit. *Journal of Applied Research in Higher Education* 14: 1670-1685. http://dx.doi.org/10.1108/JARHE-05-2021-0189

Ghanizadeh, Afsaneh, Hossein Makiabadi, Samaneh Abdi Navokhi (2019). Relating EFL university students' mindfulness and resilience to self-fulfillment and motivation in learning. *Issues in Educational Research* 29: 695–714.

Hatlevik, Ove E., Vibeke Bjarnø (2021). Examining the relationship between resilience to digital distractions, ICT self-efficacy, motivation, approaches to studying, and time spent on individual studies. *Teaching and Teacher Education* 102. https://doi.org/10.1016/j.tate.2021.103326

Holec, Henri (1979). *Autonomy and foreign language learning*.

Jahedizadeh, Safoura, Behzad Ghonsooly, Afsaneh Ghanizadeh (2019). Academic buoyancy in higher education: Developing sustainability in language learning through encouraging buoyant EFL students. *Journal of Applied Research in Higher Education* 11: 162–177. http://dx.doi.org/10.1108/JARHE-04-2018-0067

Kim, Tae-Young, Yoon-Kyoung Kim (2017). The impact of resilience on L2 learners' motivated behaviour and proficiency in L2 learning. *Educational Studies* 43: 1–15. http://dx.doi.org/10.1080/03055698.2016.1237866

Martin, Andrew J. (2014). Student motivation and engagement: Strategies for parents and educators. Street, Helen, and Neil Porter, eds. *Better than OK: Helping Young People to Flourish at School and Beyond*. Fremantle, WA: Fremantle Press.

Martin, Andrew J., Herbert W. Marsh (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools* 43: 267–281. https://doi.org/10.1002/pits.20149

Martin, Andrew J., Herbert W. Marsh (2008a). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology* 46: 53–83. https://doi.org/10.1016/j.jsp.2007.01.002

Martin, Andrew J., Herbert W. Marsh (2008b). Workplace and academic buoyancy: Psychometric assessment and construct validity amongst school personnel and students. *Journal of Psychoeducational Assessment, 26*(2), 168–184. http://dx.doi.org/10.1177/0734282907313767

Martin, Andrew J., Herbert W. Marsh (2009). Academic resilience and academic buoyancy: Multidimensional and hierarchical conceptual framing of causes, correlates, and cognate constructs. *Oxford Review of Education* 35: 353–370. https://doi.org/10.1080/03054980902934639

Masten, Ann S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist* 56: 227-238. https://doi.org/10.1037//0003-066x.56.3.227

Mozafari, Sara, Afsaneh Ghanizadeh, Seyyedeh Mina Hamedi (2023). EFL teachers' and students' perceptions towards virtual teaching: A qualitative analysis of benefits, challenges, future directions, and effectiveness. *Journal of Foreign Language Teaching and Translation Studies*. DOI: 10.22034/efl.2023.386414.1228

Najafzadeh, Mahsa, Afsaneh Ghanizadeh, Safoura Jahedizadeh (2018). A dynamic model of EFL learners' personal best goals, resilience, and language achievement. *International and Multidisciplinary Journal of Social Sciences* 7: 267–296. http://dx.doi.org/10.17583/rimcis.2018.3011

Nandy, Monomita, Suman Lodh, Audrey Tang (2021). Lessons from Covid-19 and a resilience model for higher education. *Industry and Higher Education* 35: 3–9. https://doi.org/10.1177/0950422220962696

Nazari, Fatemeh, Afsaneh Ghanizadeh, Sepideh Mirzaee (2023). EFL teachers' coping strategies amidst the COVID-19 virtual education and their association with work engagement and teacher apprehension. *Educational Research for Policy and Practice* 22: 1–22. https://doi.org/10.1007/s10671-022-09317-0

Reis, Sally M., Robert D. Colbert, Thomas P. Hébert (2004). Understanding resilience in diverse, talented students in an urban high school. *Roeper Review* 27: 110–120. https://doi.org/10.1080/02783190509554299

Riley, Jennifer R., Ann S. Masten (2005). Resilience in Context. Peters, Ray D., Bonnie Leadbeater, Robert J. McMahon. (eds) *Resilience in Children, Families, and Communities*. Boston: Springer. 13–25. https://doi.org/10.1007/0-387-23824-7_2.

Rutter, Michael (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry* 57: 316–331. https://doi.org/10.1111/j.1939-0025.1987.tb03541.x

Rutter, Michael (2013). Annual research review: Resilience - clinical implications. *The Journal of Child Psychology and Psychiatry* 54: 474–487. https://doi.org/10.1111/j.1469-7610.2012.02615.x

Quintiliani, Livia, Antonella Sisto, Flavia Vicinanza, Giuseppe Curcio, Vittoradolfo Tambone (2022). Resilience and psychological impact on Italian university students during the COVID-19 pandemic. Distance learning and health. *Psychology, Health & Medicine* 27: 69–80. https://doi.org/10.1080/13548506.2021.1891266

Serrano Sarmiento, Ángela, Roberto Sanz Ponce, Aurelio González Bertolín. (2021). Resilience and COVID-19. An Analysis in University Students during Confinement. *Education Sciences* 11: 533. http://dx.doi.org/10.3390/educsci11090533

Schelvis, Roosmarijn M.C., Gerard I.J.M. Zwetsloot, Evelien H. Bos, Noortje M. Wiezer (2014). Exploring teacher and school resilience as a new perspective to solve persistent problems in the educational sector. *Teachers and Teaching* 20: 622–637.

Tang, Audrey (2020). *The Leader's Guide to Resilience*. UK: Pearson & FT. https://doi.org/10.1080/13540602.2014.937962

Tinio, Victoria L. (2003). *ICT in Education.* Kuala Lumpur: e-ASEAN Task Force.

Tugade, Michele M., Barbara L. Fredrickson, Lisa Feldman Barrett (2004). Psychological resilience and positive emotional granularity: Examining the benefits of positive emotions on coping and health. *Journal of Personality* 72: 1161–1190. https://doi.org/10.1111%2Fj.1467-6494.2004.00294.x

UNESCO. (2020). COVID-19 impact on education. https://en.unesco.org/ covid19/ Education response

Wagnild, Gail, Heather M. Young (1990). Resilience among older women. *Image: The Journal of Nursing Scholarship* 22: 252–255. https://doi.org/10.1111/j.1547-5069.1990.tb00224.x

Wang, Margaret C., Geneva D. Haertel, Herbert J. Walberg (1994). Educational resilience in inner cities. Wang, Margaret C, Edmund W. Gordon, eds. *Educational Resilience in Inner-City America: Challenges and Prospects.* Hillsdale, N J: Lawrence Erlbaum Associates, 45–72.

Waxman, Hersh C, Jon P Gray, Yolanda N. Padron (2003). Review of research on educational resilience (Report No. 11). Center for Research on Education, Diversity and Excellence, University of California, Santa Cruz.

Whatman, Jenny, Kerry Harvey, Sally Boyd, Jan Eyre, Maraea Hunia, Mohamed Alansari, Jonathan Fisher, Elliot Lawes (2020). *A Rapid Review of Resilience in Schools*. New Zealand Council of Educational Research

Wolin, Steven J., Sybil Wolin (1993). *The Resilient Self: How Survivors of Troubled Families Rise Above Adversity*. New York: Villard.

World Health Organization. (2020). *Surveillance strategies for COVID-19 human infection: interim guidance,* 10 May 2020 (No. WHO/2019-nCoV/National_ Surveillance/2020.1). World Health Organization

Zimmerman, Barry J. (1990). Self-regulated learning and academic achievement: An overview. *Educational Psychologist* 25: 3-17. http://dx.doi.org/10.1207/s15326985ep2501_2

Zimmerman, Barry J., Manuel Martinez-Pons (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology* 82: 51-59. https://psycnet.apa.org/doi/10.1037/0022-0663.82.1.51

Authors' addresses

Afsaneh Ghanizadeh
Daneshgah Ave, English Department, Imam Reza International University, Mashhad, Iran
E-mail: afsanehghanizadeh@gmail.com

Maryam Majidi Yazdi
Daneshgah Ave, English Department, Imam Reza International University, Mashhad, Iran
E-mail: m.majidi.yz@gmail.com

Received: June 5, 2023

Accepted for publication: October 27, 2023

Appendix

Resilience in Virtual Education (RVE) Scale

		Strongly agree (5)	Agree (4)	No idea (3)	Disagree (2)	Strongly disagree (1)
Emotional	1) In VE, I feel anxious when I cannot connect to the class website, especially at the time of an exam. (Reverse-coded)					
	7) In VE, I feel anxious when I cannot deliver my assignment by a deadline (because of Internet disconnection, etc.). (Reverse-coded)					
	10) In VE, I am worried about cybersecurity (viruses, hacking, etc.). (Reverse-coded)					
	14) I experience anxiety when I do not have the essential equipment for VE or enough skill in using educational software. (Reverse-coded)					
	20) I have more self-efficacy in VE.					
	21) In VE, I find it less stressful to have face-to-face interaction with my teacher and classmates, ask my teacher a question, participate in discussions, give a					

	presentation, etc.					
	24) It makes me depressed that I cannot meet my classmates face-to-face in VE. (Reverse-coded)					
	30) In traditional classes, I receive more emotional support from my teacher and classmates. (Reverse-coded)					
Motivational	2) I think VE is not useful. (Reverse-coded)					
	8) I have a little enthusiasm for learning through VE. (Reverse-coded)					
	17) VE makes me hopeful because I can pursue my goals and watch courses at any time and any place.					
	22) There is more intense competition between the learners in the traditional classes in comparison to virtual ones. (Reverse-Coded)					
	25) VE encourages me to try harder to learn in comparison to traditional classes.					
	31) I am certain I can succeed in my courses despite the difficulties of VE.					
	3) In VE, I cannot comprehend the concepts of the new subjects and the teacher's instructions.					

Cognitive	(Reverse-coded)					
	9) There are fewer distractions in face-to-face classes in comparison to VE classes. (Reverse-coded)					
	16) The teacher can monitor my progress in a traditional class more carefully and solve my problems better. (Reverse-coded)					
	23) In VE, I find it easier to ask my teacher questions, answer a question, check notes, collaborate, and interact with my classmates to solve a problem, etc.					
	27) In VE, some educational applications (such as Web Quest, etc.) can provide me with the opportunity to learn at my own pace.					
	32) In VE, I face some obstacles to learning when I cannot connect to the class website or use the educational equipment and software. (Reverse-coded)					
	4) I believe that I am able to control my emotions when having difficulties in VE.					

Meta-cognitive	15) In VE, I am aware of what I am thinking no matter how hard the situation is.					
	18) I have a problem in adapting myself to VE. (Reverse-coded)					
	28) In VE, I can plan the day more efficiently.					
	11) In Virtual classes, I act as a more autonomous learner and such classes are more learner-centered.					
Sociability	5) In VE, I find it hard to make friends with my classmates. (Reverse-coded)					
	13) In VE, there is more social isolation. (Reverse-coded)					
	26) There is a more intimate atmosphere in traditional classes, which is absent in VE. (Reverse-coded)					
	29) Since there are no face-to-face classes in VE, it cannot properly humanize the classes. (Reverse-coded)					
Persistence	6) When I have a problem in VE, I try to solve it after reflecting on the cause of the problem.					
	12) When I face a problem in VE, I first contemplate diverse possible solutions to a problem in order to solve it.					

	19) In VE, I can break through any distractions when I have important things to do immediately.					
	33) I easily give up when things go wrong in VE. (Reverse-coded)					

List of Abbreviations

CFA: Confirmatory Factor Analysis
CFI: Comparative Fit Index
EFL: English as a Foreign Language
ESD: Education for Sustainable Development
ESL: English as a Second Language
GFI: Good Fit Index
GPA: Grade Point Average
ICT: Information and Communication Technology
L2: Second Language
NFI: Normed Fit Index
PB: Personal Best
PHSM: Public Health and Social Measures
RMSEA: Root Mean Square Error of Approximation
RVE: Resilience in Virtual Education
RVES: Resilience in VE Scale
SEM: Structural Equation Modeling
SLA: Second language Acquisition
UNESCO: United Nations Educational, Scientific and Cultural Organization
VE: Virtual Education
WHO: World Health Organization