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Development and validation of a scale to measure volition for learning

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Abstract

Volition explains the transition from desire, or motivation, to action especially when faced with competing goals. In learning environments, the concept refers to acting with the aim of achieving learning objectives. Despite the importance of volition in learning environments, research has rarely addressed the volition construct. Thus, the purpose of this study was to explore and develop a valid and reliable scale to measure the volition construct in online and face to face learning environments. The data for this research were collected from 594 undergraduate online learners who also took some courses face to face at a state university in Turkey. After analyzing the validity and reliability of the scale, a two-factor, 13-item volition for learning scale was developed. The scale was comprised of two factors: action planning and action control. Confirmatory factor analysis results confirm the factor structure of the scale. Results indicated that the volition for learning scale is a valid and reliable instrument that can be utilized to measure learners' volition in learning environments.

Keywords: Motivation, volition, scale development, measurement, online learning

Introduction

In learning environments, some learners have clear objectives and motivations, as well as their own strategies and methods for success. These learners, however, may sometimes feel worn out and confused if they are distracted, and in this case, may need volitional competence, which is different from motivation, to achieve their objectives (Dewitte & Lens, 1999; Kim & Keller, 2008). Motivation refers to having an objective and developing plans to achieve this objective, while volition (taking action) refers to acting with the aim of achieving these objectives (Achtziger & Gollwitzer, 2018; Brophy, 2010). In a broader sense, volition means more than just self-regulatory skills, referring rather to the regulation of cognitive, motivational and effective processes to achieve the necessary tasks on the way to completing challenging undertakings (Bartels, Magun-Jackson, & Kemp, 2009; Corno & Kanfer, 1993; Dewitte & Lens, 1999; Kuhl, 1987). The volition factor that has been added to the ARCS-V (attention, relevance, confidence, satisfaction, and volition) model of motivational design relates to situations in which a learner acts after becoming motivated to achieve an objective (Deimann & Bastiaens, 2010; Keller, 2010; Kim & Keller, 2010). When learners are not motivated enough, they tend to procrastinate (Grund & Fries, 2018). Therefore, using effective motivational and volitional strategies reduce procrastination behaviors of the individuals (Shanahan & Pychyl, 2007). In this sense, volitional competence could be considered as a complementary part of learner motivation (Angelo, 2017).

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The volition factor is mainly based on Kuhl's theory of "volitional control" (1987), Zimmerman's theory of "self-regulatory learning" (1989) and Gollwitzer's theory of "implementation intentions" (Gollwitzer, 1993; Deimann & Bastiaens, 2010; Keller, 2010). Learners take action to achieve their goals once they are motivated in the learning process; in other words, as explained in ARCS-V model, after the attention, relevance and confidence steps are completed. At this stage, the instructor employs various tactics and strategies in motivational design to encourage learners to take action, and as a result put effort into achieving their goals. The volition factor promotes the attention, relevance and confidence drivers in ARCS-V model. So, it is a crucial element for learners to maintain their motivation and feel satisfied. In this context, the volition factor plays a key role and serves as a bridge between all aspects of the model. Keller (2008a, 2008b, 2010) emphasizes that learners will be motivated to learn and will feel satisfied after the first three factors (attention, relevance, and confidence) are successfully applied in the learning process. However, the volition factor, which was added later to the model, plays a unique and necessary role linking the first three factors with satisfaction (Keller & Deimann, 2012).

Motivation in learning environments expresses the expectations and desires of the learners. In learning environments, learners need to have sufficient motivation to achieve their goals. However, within this context, although motivation is necessary, sometimes it is not a sufficient condition. Motivated learners should also have the necessary volition competency to reach their goals (Keller, 2010; Kim & Keller, 2010). Motivation refers to having a specific goal and developing plans for that goal. On the other hand, volition means taking action to achieve these goals, endeavoring to achieve the plans, and ultimately reaching the goal. Volitional support is necessary when there is resistance to realizing or reaching these expectations. In this respect, volition helps administrators, teachers, and learners to remove these resistances to reach the goals set in learning environments (Gollwitzer, 2015; Ottingen, Schrage, & Gollwitzer, 2016). Within these concerns in mind, this study targeted to contribute to literature on learning by presenting an applied measure of volition that can be used to evaluate the learners' volitional competency and integrated with the ARCS-V model. The conceptual foundation for this model has already been established (Keller, 2008a) and will now be supported by a volition scale that can be added to the model for better understanding the individual differences in learning environments.

Motivation and learning

Similar to the general paradigm shifts in the field of education, there have been considerable trends in regard to conceptualizing motivation. In face-to-face and online learning environments, counseling, guidance, support, and incentives are considered to be external effects for learners. In extensive learning environments where massive open online courses are conducted, the presentation of content prepared previously by the tutor and assessment based on that content can be given as an example of a behavioral approach (Bonk & Khoo, 2014). Researchers have introduced different perspectives to the behavioral approach to make sense of learning processes and types. By the end of the 1950s, a paradigm shift had begun to take place in learning theory in which educators began to better understand learning processes, and placed emphasis on more sophisticated cognitive structures, such as reasoning, problem-solving, information processing and language, rather than on behaviors that can be easily observed (Ertmer & Newby, 1993). Through such a cognitive approach, more sophisticated structures related to learning began to come into prominence with the advent of computers and other ICTs in education. In this approach, learning is considered to be a process of knowledge acquisition, and the instructor is seen as a consultant who conveys information,

provides meaningful learning experiences and increases motivation to facilitate learning. In learning environments, cognitive psychology has been considered to harmonize teaching materials, motivation and learning strategies to suit the learners' learning styles (Bonk & Khoo, 2014). However, in the constructivist approach, learners relate to, make discoveries, learn and make sense of things based on their past learning and experiences. In this regard, it is the learner who is at the core rather than the instructor, who is seen as a facilitator and guide. It is, therefore, very important that the instructor uses motivational strategies to support learners and to improve learning.

Of the many concepts and theories of human motivation, one that has proven to be valid and practical for measuring and promoting learning motivation is called the "ARCS" model (Keller, 2010). This acronym is based on the four primary components of this theory which integrates attention (A) getting activities, such as curiosity arousing tactics, with stimulus characteristics that generate a sense of relevance (R) or perceived importance of the subject matter, combined with confidence (C) in one's ability to learn it, and stimuli that confirm one's success and provide a positive feeling of satisfaction (S). Each of these four components contains subcomponents and together they provide a holistic model of motivation to learn.

This model has been empirically validated in many contexts and is supported by measurement instruments that have been translated into numerous languages (Keller, 2010). However, one limitation of the model has been in the area of volition (Keller, 2008a) which is a concept that explains the transition from desire, or motivation, to action especially when faced with competing goals. A strong desire can lead directly to actions aimed at achieving given goals but not always. For example, assume that on Thursday I need to finish writing a term paper before it is due on Friday morning, but an unexpected invitation to play soccer with friends that afternoon could cause me to fail to achieve this goal. This is when volition becomes important. In order to achieve my goal in spite of this appealing distraction, I must use volitional strategies that strengthen my determination to stay on task. Thus, in order to study situations such as this and design interventions, it would be useful to have a measure of volition to supplement the four ARCS components.

The concept of volition was added to the ARCS model (Keller, 2008a) making it the ARCS-V model but a problem was that there was no efficient way to measure it. There are well-known concepts and measures related to volition such as action control (Kuhl, 1987), implementation intentions (Gollwitzer, 1999), and self-regulation (Zimmerman, 1989), but none of them is suitable for applied settings which require brief but effective measures especially when used in combination with other measures.

Measuring volition

Even though there are some instruments being used in both online and face to face learning environments to measure the volition construct, these instruments are not suitable for applied settings which require brief but effective measures, especially when used in combination with other measures related to motivational design model. For example, the Volition Persona Test (VPT) developed by Deimann, Weber and Bastiaens (2009), consists of 32 items measuring volitional competency of online learners in four factors, namely, volitional self-efficacy, consequence control, emotion control, and meta-cognition, but it does not address volition for learning. Instead, it addresses the level of volitional competency of learners. In this sense, the Volition Persona Test is a diagnostic tool. Similarly, the Academic Volitional Strategy Inventory (AVSI) (McCann & Turner, 2004) consists of 20 items with three factors assessing learners' propensity for volitional control in academic environments. The scale mainly focuses on learners' emotion and motivation. In another

approach Kuhl and Fuhrmann (1998) developed the Volitional Components Inventory (VCI) as a measure of volition in regard to volition competency, self-reflection, and volition inhabitation domains. The scale primarily focuses on beliefs, needs, and experiences of a person to his/her personal goals and expectations of others. Even though these scales are important and have value and expediency in their context, none of them specifically measures volition for learning nor are they compatible for integration with other elements of motivation as in the ARCS-V model. Also, the existing measurement scales of volition cannot be used to get volition for learning in interactive learning environments. Most of the learners, today, have touchy motivation and are easily dropping out the learning environment. Being able to measure the students' volition for learning creates opportunities for using appropriate instructional designs and strategies in learning environments. The present new scale will allow instructional designers, instructors, and researchers to study volition for learning of students in both online and face to face learning environments. More specifically, this study aims to develop a reliable and valid scale to measure volition for learning to be used in the context of ARCS-V model in online and face to face learning environments. Therefore, the research questions for the present study are as follows:

1. To what extent can volition for learning be measured by a new measurement scale?
2. Does the volition for learning scale developed in the present study produce an acceptable level of reliability and validity?

Research methodology

Scale development

The scale development process and steps proposed by DeVellis (2012), Germain (2006), Hinkin, Tracey and Enz (1997), Netemeyer, Bearden and Sharma (2003) were taken into consideration in the development of the volition for learning scale (VFLS). In this process, research data were gathered from the learners who took online courses at a state university in Turkey. In addition to this, feedback was received from five field instructors who were working in the field and face-to-face interviews were held on the understanding of the scale items at two different times and with different groups of learners. The final state of the scales was obtained by performing explanatory and confirmatory factor analysis. SPSS 23.0 and M*plus* 7 (Muthen & Muthen, 2012) programs were used in the reliability and validity analyses of the scale.

Determining the construct dimensions

In this study, volition for learning was addressed in the context of online learning motivation and volition to learn. This measure was based on Keller's (2008a) motivation, action and performance (MVP) theory, ARCS-V motivation design model, and Kuhl's (1987) action control theory. In order to understand the basic structure and conceptual framework of volition competency at the highest possible level, the researchers searched and reviewed the existing literature and content analysis were conducted accordingly. Besides, the previous scales related to volition concept were examined. Once the volition construct and its probable sub-components were defined, the researchers thought clearly about the construct to be measured. After understanding and determining the scope of the construct grounded in the related theories, questions as bases of the construct were formed. Within the substantive literature related to volition construct to be measured, two dimensions come up: volition planning and volition control.

Generating and reviewing the Item pool

Once the aim of the measurement scale has been defined clearly, the researchers began to write items. A set of 64 volition for learning items related to the two domains was initially generated from a review of a literature and content analysis. During the item pool generation, Volitional Components Inventory (Kuhl & Fuhrmann, 1998), Academic Volitional Strategy Inventory (McCann & Turner, 2004), and Volition Persona Test (Deimann et al., 2009) instruments were examined.

In order to ensure the content validity of the instrument, three experts reviewed the initial item pool. The experts have carried out research on motivation and volition. According to construct domain, experts are asked to assess each item using a 4-point measurement scale in which 1 stood for *not representative* and 4 stood for *strongly representative.* After the experts assessed the items and provided suggestions for some items, the researchers analyzed the results and comments. Accordingly, decisions were made on refinement of the items based on conformity at least between two experts. As a result of this refinement, a set of 57 items, 46 positive and 11 negatives, were decided for the instrument. After this process, the instrument was sent to another four experts who are proficient in scale development. These experts checked the items in terms of ambiguity. Some items were revised according to the experts' suggestion. Then, the survey items were reviewed by 13 undergraduate seniors who took online courses before. The students responded to each item and discussed the items that seemed unclear or difficult to respond. Accordingly, the researchers revised the survey.

The items in the volition scale are written in the form of declarative statements; therefore, a 5-point Likert-type scale format was adopted. Participants indicated a varying degree of agreement with the statements. Participants scored the items on the Likert-type scale to measure each item ranging from *completely disagree* (1) to *completely agree* (5).

Data collection

The developed scale was administered at the end of the fall semester of the 2017–2018 academic year at Bilecik Seyh Edebali University, a state university, in Turkey. The reference population of the present study was students who were taking online English course at the university. There were 4.832 first-year college students taking at least one online course. Data for this study was collected through convenience sampling method from students enrolled in five faculties at the university. Regarding the sample size, even though there is no consensus on this matter, a sample size of 300 is generally accepted as an adequate number (DeVellis, 2012; Netemeyer et al., 2003, Tabachnick & Fidell, 2007) in scale development studies. In this study, it was aimed to have at least 10 participants per item. For this purpose, it was aimed to reach at least 570 participants for the initial scale that was comprised a pool of 57 items. Therefore, a total of 750 scale forms were distributed considering unreturned and incomplete forms. The scale was administered in two weeks and 617 scale forms were returned indicating a response rate of 82.3%. Of these returned scale forms, 23 were omitted because of incomplete items and the final data were driven from 594 forms available. Of the participants, 311 were female (52.4%) and 283 were male (47.6%). The majority of the participants (276 females, 232 males) were in the age group of 18 to 20. Students in this age group comprised 85.5% of the sample (508 students). Other respondents (35 females, 51 males) were in the age group of 21 and above and this group comprised 14.5% of the sample (86 students).

Refining of the measurement scale

Descriptive statistics of the instrument were examined before the scale was tested for validity and reliability. In this context, corrected item-total correlations and skewness and kurtosis values of the items were examined. The values of items for skewness and kurtosis measures were between -1 and +1. These values are considered acceptable for normal distribution (Huck, 2012). Then, in order to refine the measurement corrected item-total correlations of items were computed. For initial assessment and purification, items loading at 0.4 and above were retained for a valid and reliable measuring instrument (Chen, Bao, & Huang, 2014; Gliem & Gliem, 2003; Kim, Ritchie, & McCormick, 2012). Based on this criterion, items with the corrected item-total correlation of <0.4 were deleted. Within this context, 18 items (r <0. 4) with a low correlation and discriminative value were subtracted from the scale. This process resulted in 39 items. Accordingly, after this procedure, the internal consistency reliability coefficient (Cronbach's alpha) of the scale increased from 0.919 to 0.937.

Exploratory factor analysis (EFA) was carried out on the remaining 39 items. Before performing EFA, the validity of the data for factor analysis was examined. For this purpose, the Kaiser-Meyer-Olkin (KMO) test was performed to determine the adequacy of sampling and the Bartlett's Test of Sphericity was conducted to determine if there was a sufficient relationship between variables. The Kaiser-Meyer-Olkin (KMO) value was 0.943 and the Bartlett's Test of Sphericity was 8986.729, the degree of freedom= 741 and p<0.001. These results pointed out that the factor analysis was appropriate and would yield reliable results.

In the factor determination phase, when deciding on how many factors to be extracted, the parallel analysis method which is one of the reliable and popular methods was used. In parallel analysis, random data are generated parallel to the real data to determine the number of factors, and the eigenvalues of this parallel data are found. Then, by comparing the eigenvalues of the parallel data with the real data, the place where the parallel data eigenvalue is higher than the real eigenvalue is regarded as the appropriate factor number (DeVellis, 2012). As a result of parallel analysis, two factors were extracted for the scale. Table 1 shows the descriptive statistics of the items included in two factors.

Table 1: Descriptive statistics of the items

Item code	Item	M	SD	Skew-ness	Kurtosis	Corrected item-to-total correlation
VP7	My commitment to achieve the goals in this class was strong relative to the goals in my other classes.	3.19	1.247	-.169	-.898	0.447
VP8	I set up goals for my learning.	2.93	1.283	.025	-1.002	0.429
VP10	I was confident that I could avoid obstacles while doing my work.	3.16	1.222	-.190	-.841	0.449
VP11	I was prepared to work hard to achieve my goals no matter what my other classes required.	2.95	1.265	-.190	-.978	0.434
VP12	I was able to prepare a study plan that listed concrete tasks.	2.40	1.188	-.190	-.669	0.434

Continued

Table 1: Continued

Item code	Item	M	SD	Skew-ness	Kurtosis	Corrected item-to-total correlation
VC18	I kept my feelings under control while working to complete this class.	2.89	1.267	-.190	-1.023	0.506
VC19	I added more effort to stay on task if my focus on my goal in this class began to decline.	3.13	1.226	-.190	-.858	0.511
VC27	I was able to avoid being distracted by competing goals.	3.21	1.195	-.190	-.808	0.570
VC28	I was able to create a setting free of uncontrollable distractions.	3.01	1.248	-.190	-.978	0.605
VC29	I was able to know when to stop look-ing for more information to prepare for an exam	3.21	1.349	-.190	-1.119	0.474
VC36	I didn't let social pressure affect my performance.	3.15	1.297	-.190	-1.002	0.485
VC37	I anticipated personal or social events that might cause me to get behind.	2.96	1.306	-.190	-1.038	0.521
VC42	When my motivation decreased, I was able to think of things to do to build it back up again.	3.17	1.275	-.190	-.982	0.538

When making decision on keeping an item, the factor loading and the communality value of the items ($r > 0.40$) are checked through. Items with cross-loadings, a difference less than 0.10 between items, were extracted one after another. As a result, a two-factor structure with 13 items was gathered (Appendix A). The Cronbach's alpha scores for the two extracted factors demonstrated acceptable values (Table 2).

Table 2: Exploratory factor analysis results for VFLS

Dimensions and items	Factor loadings	
	Factor 1	Factor 2
Dimension 1: Volition Planning		
1. My commitment to achieve the goals in this class was strong relative to the goals in my other classes.	0.640	
2. I set up goals for my learning.	0.737	
3. I was confident that I could avoid obstacles while doing my work.	0.628	
4. I was prepared to work hard to achieve my goals no matter what my other classes required.	0.723	
5. I was able to prepare a study plan that listed concrete tasks.	0.658	

Continued

Table 2: Continued

Dimensions and items	Factor loadings	
	Factor 1	Factor 2
Dimension 2: Volition Control		
6. I kept my feelings under control while working to complete this class.		0.657
7. I added more effort to stay on task if my focus on my goal in this class began to decline.		0.594
8. I was able to avoid being distracted by competing goals.		0.697
9. I was able to create a setting free of uncontrollable distractions.		0.706
10. I was able to know when to stop looking for more information to prepare for an exam		0.525
11. I didn't let social pressure affect my performance.		0.695
12. I anticipated personal or social events that might cause me to get behind.		0.617
13. When my motivation decreased, I was able to think of things to do to build it back up again		0.622
Eigen values	3.412	2.484
Total variance (%)	26.464	19.108
Cumulative variance (%)	26.246	45.354
Cronbach's alpha	0.732	0.809
Cronbach's alpha (total)	0.825	
Items per factor	5	8

The two factors explicated 45,354% of the total variance. The Cronbach's alpha scores for the two factors were 0.732 and 0.809 respectively. The total Cronbach's alpha was 0.825. These values indicated sufficient reliabilities.

Results

Confirming the measurement model

In order to assess the latent structure of the measure, confirmatory factor analysis (CFA) was performed. Before performing the CFA, a process proposed by Kim et al. (2012), and Chen et al. (2014) was followed. Accordingly, the sample (594 individuals) was divided into two random subsamples using SPSS 23.0 routine random case selection. One sample was a calibration sample with 291 cases, while the other sample was a validation sample with 303 cases. The 13 measurement items with two-factor structure were tested for internal consistency and validity in M*plus* version 7.0 (Muthen & Muthen, 2012).

When assessing the model fit, several stand-alone and comparative indices that evaluated the goodness of fit of the CFA to the data were used. In this context, the value of Chi-square to the degree of freedom (χ^2/sd), the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), standardized root mean square residual (SRMR) indices were examined.

When evaluating the model fit indices, the following values were used: χ^2/sd <3.00 RMSEA<0.07, CFI>0.90, TLI>0.95 and SRMR <0.07 (Hu & Bentler, 1999; Schermelleh-Engel & Moosbrugger, 2003). The results of CFA demonstrated that both calibration and validation samples fit the data optimally. The calibration sample fit indices were χ^2 = 122.64, χ^2 to df = 2.31, RMSEA = 0.06, CFI = 0.95, TLI = 0.94, and SRMR = 0.05. The validation sample fit indices were χ^2 = 128.78, χ^2 to df = 2.01, RMSEA = 0.58, CFI = 0.96, TLI = 0.95, and SRMR = 0.05. All fit indices were acceptable values and the CFA model fitted well. Although the TLI index in the calibration sample was slightly below the accepted value, this result was acceptable because it was 0.964 and very close to 0.950.

Validation of the measure

As the CFA model fits well, parameter estimates, and related diagnostics are used to further assess the model. For this aim, convergent validity, composite reliability, and average variance extracted were used. Firstly, convergent validity was evaluated by controlling the factor values of 0.40 and above, and the values of average variance extracted near the 0.50. However, if the composite reliability of the factors is greater than 0.60, the average variance extracted can be accepted to be 0.40 (Fornell & Larcker, 1981; Huang, Wang, Wu & Wang, 2013). Accordingly, it can be said the convergent validity of the scale is acceptable. Secondly, the internal consistency of the items in the measure was calculated by composite reliability. The composite reliability of the constructs was between 0.77 and 0.84 and these values seem reasonable (Bagozzi & Yi, 1988). Lastly, the average variance extracted, a measure of internal consistency-based diagnostic, was used. The acceptable value for this measure is near 0.50 (Fornell & Larcker, 1981), but as the composite reliability of the factors is greater than 0.60, the value of 0.40 and above can be reasonable for this newly developed measure (Table 3).

Table 3: CFA results of VFLS for calibration and validation samples

Factors and Items	Calibration sample (n=291)				Validation sample (n=303)			
	FL	R^2	CR	AVE	FL	R^2	CR	AVE
Factor 1: Volition Planning			*0.78*	*0.42*			*0.77*	*0.40*
My commitment to achieve the goals in this class was strong relative to the goals in my other classes.	0.56	0.31			0.60	0.36		
I set up goals for my learning.	0.56	0.31			0.71	0.50		
I was confident that I could avoid obstacles while doing my work	0.68	0.47			0.59	0.35		
I was prepared to work hard to achieve my goals no matter what my other classes required.	0.70	0.49			0.67	0.46		
I was able to prepare a study plan that listed concrete tasks.	0.68	0.47			0.56	0.32		
Factor 2: Volition Control			*0.84*	*0.40*			*0.84*	*0.40*
I kept my feelings under control while working to complete this class.	0.62	0.39			0.65	0.43		

Continued

Table 3: Continued

Factors and Items	Calibration sample (n=291)				Validation sample (n=303)			
	FL	R^2	CR	AVE	FL	R^2	CR	AVE
I added more effort to stay on task if my focus on my goal in this class began to decline.	0.62	0.38			0.59	0.35		
I was able to avoid being distracted by competing goals.	0.66	0.44			0.75	0.56		
I was able to create a setting free of uncontrollable distractions.	0.69	0.47			0.76	0.58		
I was able to know when to stop looking for more information to prepare for an exam.	0.49	0.24			0.45	0.20		
I didn't let social pressure affect my performance.	0.62	0.39			0.63	0.40		
I anticipated personal or social events that might cause me to get behind.	0.68	0.46			0.57	0.33		
When my motivation decreased, I was able to think of things to do to build it back up again.	0.62	0.38			0.59	0.35		

FL = Standardized factor loading; CR = composite reliability; AVE = average variance extracted.

Discussion

The main aim of this study was to develop a reliable and valid instrument to measure the volitional aspects of online and face to face learners. In this process, the scale development routines proposed by DeVellis (2012), Germain (2006), Hinkin et al. (1997), Netemeyer et al. (2003) were followed and a reliable and valid VFLS was developed and validated. Based on the results of item analysis and factor analysis, a two-factor structure with 13 items was gathered. The CFA using Mplus was performed for the validity of the scale. In this analysis, the data were divided into two, as calibration and verification, to provide cross-validation. 291 data were obtained for the calibration sample, and 303 data for the verification sample. Similar valid and reliable values were obtained in both samples according to the model compliance values.

These findings were important in terms of contributing to the learning process and instructional design in the context of volition for learning in self-directed learning settings such as online education. It is considered that the online learners' volition competence can be examined in theoretical and practical context and planning of appropriate processes and strategies can contribute to learning and system. It can be said that the findings of this research are important when considering the lack of studies conducted in this field in learning environments especially online learning. These findings are fundamentally different from those found in the literature (Deimann & Bastiaens, 2010; McCann & Turner, 2004; Kuhl & Fuhrmann, 1998). While other studies have independently addressed the volition factor on a theoretical basis, this study has been developed with the theoretical background taking into consideration Keller's MVP theory and the last factor in the ARCS-V motivation design model. It can be said that the scale developed in this sense is the first

scale in the field of online education. In the planning and analysis of the volition factor strategies included in the motivation model, different scales are used up to now (Keller & Deimann, 2012). This is because there is no reliable and valid scale to measure this factor in the context of the motivation model. In this sense, the VFLS developed in this study can successfully be used in the context of motivation modeling.

Conclusion

The concept of volition is especially important in online education because learners are away from both the teachers and the learning environment physically. Online learners need self-regulation skills as well as adequate level of motivation and volition (Hartnett, 2016; Keller, 2010, 2017). For this purpose, the VFLS was developed in the context of Keller's MVP theory and ARCS-V motivation model. The results of the analysis show that this scale is reliable and valid. In addition, the scale can be used to determine the volition competences of both online and face to face learners. Moreover, instructional designers and teachers can employ this scale in the development of volition strategies and tactics for learners in the context of the ARCS-V model and measure the effectiveness of these strategies. Accordingly, effective and efficient instructional designs can be made considering the scale results. As a last point, researchers can benefit from this scale when conducting various types of research in the context of volition for learning.

Limitations and future research

This study has some limitations. The data for this study were collected from online learners who also took some courses face to face. Therefore, it can be an important future study to examine whether the same factor structures are obtained in a validity study of the scale with the learners who take all courses via online or face to face. In addition, within the ARCS-V model, researchers can be advised to test the effectiveness of strategies to be prepared based on this scale. The participants in this study were Turkish learners. Therefore, researchers in different countries are recommended to verify the instrument in different cultural milieus. Finally, the validity of this study in different educational contexts may also be an important study.

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Appendix A. Volition for learning scale (VFLS)

The VFLS survey consists of 13 statements with two subscales, namely action planning (items 1–5) and action control (items 6–13). In the survey, a 5-point Likert-type scale format was adopted (1-Completely disagree through 5-Completely agree).

1. My commitment to achieve the goals in this class was strong relative to the goals in my other classes.
2. I set up goals for my learning.
3. I was confident that I could avoid obstacles while doing my work.
4. I was prepared to work hard to achieve my goals no matter what my other classes required.
5. I was able to prepare a study plan that listed concrete tasks.
6. I kept my feelings under control while working to complete this class.
7. I added more effort to stay on task if my focus on my goal in this class began to decline.
8. I was able to avoid being distracted by competing goals.
9. I was able to create a setting free of uncontrollable distractions.
10. I was able to know when to stop looking for more information to prepare for an exam.
11. I didn't let social pressure affect my performance.
12. I anticipated personal or social events that might cause me to get behind.
13. When my motivation decreased, I was able to think of things to do to build it back up again.