Self-directed Learning Predicts Online Learning Engagement in Higher Education Mediated by Perceived Value of Knowing Learning Goals

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Abstract Online education has made it possible to implement the "classes suspended but learning continues" policy during the COVID-19 outbreak. However, the intangible sense of the online educational setting requires self-directed learning (SDL) and may force students to know the goals of learning that may impact their engagement. To understand the effect, based on situated expectancy-value theory, this study considered SDL as attitude and approach and constructed a research model to explore the mediating power of perceived value of knowing learning goals (PVKLG) related to participants' online learning engagement during the COVID-19 lockdown. Data were collected from 497 higher education students in China. After the confirmatory factor analysis with structural equation modeling, the results reported that SDL attitude and approach positively predicted learning engagement mediated by PVKLG. The results suggest that only when students have a high level of PVKLG will they be able to regulate their learning process through the two types of SDL and enhance their engagement in online learning contexts during the COVID-19 lockdown.

Keywords Self-directed learning · Learning engagement · Learning goals · Perceived value · Online learning

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Introduction

Online education has gained much attention and has been adopted by higher education institutions in recent years, especially during the outbreak of COVID-19. Online education has the potential to make learning processes more student-centered (Dwivedi et al., 2019). However, it has been reported that during COVID-19, students' online learning engagement in higher education has been low (Pengpai News, 2020). In this circumstance, online learning effects mainly depend on students' self-directed learning (SDL) (Zheng et al., 2020). Additionally, in online learning contexts, participants need to know the learning goals that influence them in order to regulate their learning (Zhu, 2021). However, few studies have looked at whether learning goals affect students' learning engagement if they know about them.

Students often ask "Why do I have to learn this?" (Schmidt et al., 2019), which indicates that the perceived usefulness of learning a subject is the main determinant of particular learning behaviors (Dweck, 1986). That is, attainment or utility value is related to the centrality of goals for learners' sense of identity (Eccles, 2009). Moreover, to elaborate on value theory, Eccles and Wigfield

(2020) updated the expectancy-value theory (EVT) with social cognition and sociocultural perspectives, naming the revised version the Situated Expectancy-Value Theory (SEVT). SEVT stresses the impact that both the situation and the cultural background have on an individual's developing expectancy and value. Considering online learning during COVID-19, it is situated in an epidemic sociocultural condition, which makes it possible to carry out all teaching-related activities on the Internet. This situation presents an expectation of how online learners can benefit from online learning which requires their SDL (Beach, 2017; LaTour, & Noel, 2021). Besides, students' expectancy and value beliefs about different types of situated learning are important predictors of the effort students make and their engagement in those situations (Wigfield et al., 2009). As COVID-19 has created a new situation of having students learn online, how the learning values as learning goals students expect that may relate to their online learning engagement is interested in this study.

Various domain-specific, cross-sectional studies have found that perceived task value and related expectancy of success are positively correlated with and interactively linked to students' achievement and to their academic choices (e.g., Guo et al., 2017; Seetee et al., 2021). However, how SDL influences the value perception of learning goals and reflects their online learning engagement has not been extensively studied during COVID-19; thus, the present study drew on SEVT to form a research model to explore students' SDL in predicting their learning goal value perception and learning engagement, particularly when using Zoom or Tencent Lecture Hall as the online learning platform.

Literature Review

The Situated Expectancy-Value Theory

EVT has been adopted in numerous studies to predict and explain students' task choices, their learning persistence, and their academic performance (Wigfield & Eccles, 2000). Traditionally, EVT argued that students' expectancy of success and their subjective task value had a direct influence on their achievement choices, effort, persistence, and performance (Wigfield & Eccles, 1992, 2000). EVT has been widely applied in different domains, including language learning (e.g., Seetee et al., 2021), science subjects (e.g., Guo et al., 2017), and mathematics (e.g., Fong et al., 2021). Those studies revealed that school and national curricula seem to offer students fewer choices and less autonomy in the highly competitive learning situation, which erodes students' expectancy to put in effort, especially in those subject domains in which they have learning

difficulties (Loh, 2019). In line with the limitation of EVT to address the application of value theory, Eccles and Wigfield (2020) extended the classic expectancy-value model to SEVT. They discussed the central part of the model which focuses on how learners understand and interpret their performance and their perceived value of their activity participation in a particular situation.

In SEVT, Eccles and Wigfield (2020) stress the impacts that situations have on learners' developing expectancy and value and their relation to performance, choice, and engagement. Learners need to make decisions about what goals to study, in what order to study, how to study, how long to study, when to study, and when to terminate their study, but they may not always make effective choices; thus, there is a critical need to understand attitudes and processes behind learners' choices to ensure better learning engagement (Kirk-Johnson et al., 2019). Based on SEVT, the present study examined the direct relationships between the approach and attitude of SDL and perceived value of knowing learning goals (PVKLG), and PVKLG for predicting students' online learning engagement during COVID-19.

Self-directed Learning Attitude and Approach

Garrison (1997) stated that SDL is "an approach where learners are motivated to assume personal responsibility and collaborative control by self-monitoring and self-management" (p. 18). Moreover, learning approaches are dynamic; they can change depending on context, which emphasizes the significance of the contextual situation (Dolmans et al., 2016). Caffarella (1993) illustrated SDL as an attitude toward self-initiated learning. Song and Hill (2007) highlighted SDL including learning approaches, personal attitude, and learning contexts as the effect of SDL in online environments. Accordingly, this study divided SDL into SDL attitude and approach, both of which affect learners' online learning behavior.

Previous research has shown that learners' learning attitudes and approaches impact their concentration while learning; moreover, learning attitudes and approaches are context dependent (Biggs et al., 2001). In line with the school lockdown situation of COVID-19, virtual learning has become socioculturally dependent (Eccles & Wigfield, 2020), and the self-control of learners has become essential to success in online learning. Learners' attitude and approach toward learning will also have a great impact on the learning effects. Hence, the roles that students' different types of SDL play in their online learning during the pandemic were explored in this study.

Perceived Value of Knowing Learning Goals

According to Seijts et al. (2013), "A learning goal frames the goal instructions in terms of knowledge or skill acquisition" (p. 196). In the educational context, the definition of perceived value emphasizes learners' trade-off choice (de Moura et al., 2021). Briefly, knowing learning goals can enable students to participate meaningfully in learning processes, which plausibly improves the perceived value of learning (Torshizi & Bahraman, 2019), when students perceive that the value of knowing learning goals can motivate them to achieve the goals (Chang et al., 2018). Thus, this study considered PVKLG as an important factor for improving students' performance in online learning.

In educational programs which design learning goals with a transformative aim of information processing (Stetsenko, 2017), as Bloom's Taxonomy of educational objectives, the model of human information processing is implicited (Arievitch, 2020). Moreover, learning goals differ across tasks in different learning situations (Hein et al., 2019). Although previous studies have explored learning goals, few have applied them to online education contexts or have explored how learners' perceptions of the value of knowing learning goals affects their learning. Accordingly, the present study defined PVKLG in online courses as students actively strive to engage in online learning during the COVID-19 pandemic lockdown.

Learning Engagement

Learning engagement is commonly considered as a predictor of academic performance (Froiland & Oros, 2014). Fredricks and Paris (2004) identified student engagement as comprising the three dimensions of behavioral engagement, emotional engagement, and cognitive engagement. In online learning contexts, behavioral engagement refers to those activities related to the learning itself and which cause issues during learning processes. In comparison, cognitive engagement refers to the extent of learners' cognitive efforts to acquire complex information and to deal with online learning issues, while emotional engagement refers to the degree of learners' positive feelings toward their instructors, peers, and/or the online learning itself (Jung & Lee, 2018).

Learning engagement for distance learning contexts has attracted considerable attention because of its psychological mechanisms (Geng et al., 2020). However, online learning has been criticized because of its weak engagement practices, which hinder interactivity and the generation of personalized feedback (Chapman et al., 2016). Students have to practice autonomous learning by themselves during online learning, but how they really engage in online learning during the COVID-19 lockdown has not been extensively studied; thus, the present study focused on students' online learning engagement during the COVID-19 pandemic.

Hypotheses and Research Model

Hypotheses

SDL Attitude and Approach Relevant to PVKLG

SDL is an individual characteristic influencing students to become aware that they are individually responsible for their own learning. They tend to become clear about their learning needs and are willing to set their own learning goals (Fatemeh et al., 2016; Karatas & Arpaci, 2021). A previous study pointed out that improving learning attitude and learning approaches is essential to online learning (Shahrouri, 2016). Moreover, there is overwhelming research evidence showing that SDL is crucial to PVKLG (e.g., Froiland & Worrell, 2016; Song, 2021); however, few studies have investigated whether students' SDL is related to their PVKLG; thus, how the two types of SDL are related to PVKLG was hypothesized as follows:

H1　SDL attitude is positively related to PVKLG.

H2　SDL approach is positively related to PVKLG.

PVKLG Relevant to Learning Engagement

Knowing the learning goals can enhance learners' motivation and then in turn increase their behavioral engagement. Kizilcec et al. (2017) found that knowing the learning goals can predict learners' engagement in the pursuit of personal course goals. Learners with stronger PVKLG are more likely to revise their course materials. Another study pointed out that achieving learning goals signify students' perceptions that the learning goals will orient their engagement in pre-class learning (Sun & Xie, 2020). Research has highlighted that learning goals lead to higher cognitive engagement (Froiland & Worrell, 2016) and students will decrease cognitive engagement if there are unclear learning goals (Lane et al., 2021). However, few studies have identified whether the three types of learning engagement can be predicted by PVKLG. Thus, how students' PVKLG in online learning tasks may influence their three types of engagement was hypothesized as follows:

H3　PVKLG is positively related to behavioral engagement.

H4 PVKLG is positively related to emotional engagement.

H5 PVKLG is positively related to cognitive engagement.

SDL Attitude and Approach Relevant to Learning Engagement

Learning persistence is one type of SDL attitude, which relates to students' continued engagement with courses, and shows the extent to which learners meet the learning goals that are provided by teachers as learning opportunities for online learning (Jung & Lee, 2018). Moreover, in online learning environments, SDL learners will evaluate cause and effect that affects their attitude and motivation to engage more to meet their learning achievement needs. Reschly and Christenson (2012) posited that the student engagement framework is mediated by students' perceived learning value in relation to their belief in SDL. However, in the context of the pandemic lockdown, how the two types of SDL related to the three types of online learning engagement mediated by students' PVKLG was hypothesized as follows:

H6 SDL attitude and approach are related to the three types of learning engagement mediated by PVKLG.

Research Model

Expectancies for success in a job are related to individuals' beliefs about how well they are able to complete tasks by themselves (Eccles & Wigfield, 2002). According to SEVT, students' engagement in tasks is driven by their task-specific beliefs, and more specifically, the expectancy they have that they can succeed in performing certain tasks, and the value they attach to those tasks. Drawing on SEVT, how SDL attitude and approach related to PVKLG and the three types of learning engagement related to online learning during COVID-19 are hypothesized in the following research model (see Fig. 1). Particularly, the direct effects are depicted as Hypotheses H1–H5, whereas the indirect effect, which means the relationships between the two types of SDL and the three types of engagement mediated by PVKLG, is stated as H6.

Methods

Procedure and Participants

This study applied snowball sampling and targeted students in higher education. The instruments to measure different variables were made into electronic questionnaires, which
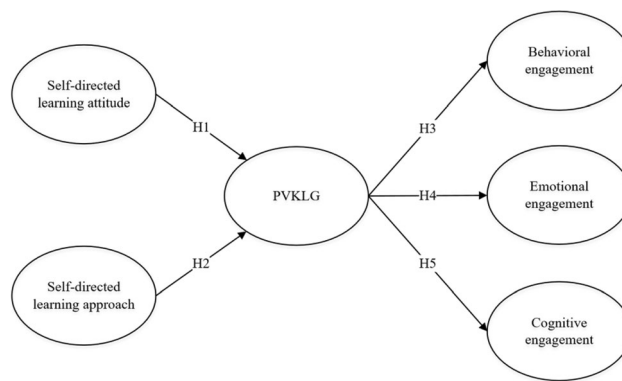
Fig. 1 The research model

were opened for a week in June 2020. Participants were selected from university student associations in Beijing. All participants were informed of the objectives and the confidentiality of the study, and they could quit the investigation at any time. They were also informed that there were no correct or incorrect answers to the items.

A total of 535 students submitted their responses, from which the invalid responses were deleted (i.e., those responses with the same option for all items), leaving 497 valid data for analysis. In terms of gender, 30% (149) were male and 70% (348) were female; as for school level, 385 (77.5%) were undergraduate students and 112 (22.5%) were graduate students. The participants were aged between 17 and 55 years ($M = 22.14$, $SD = 4.61$).

Instruments

The questionnaire items were adapted and modified from previous theories and researchers, and a 5-point scale, from 1, meaning *strongly disagree* to 5, meaning *strongly agree*, was adopted. The reliability and validity were tested after data collection and were then subjected to confirmatory factor analysis (CFA).

- *SDL* Measuring SDL can offer an understanding of individuals' attitudes toward online learning and provide further insights into how individuals use approaches to learn from online environments (Beach, 2017). Adapted from this assertion, the present study designed five items for SDL attitude and five for SDL approach; see Table 1 for sample items.

- *PVKLG* Johnson and Payne's (1985) behavioral decision theory can explain individuals' choices in a range of decision-making situations, as well as the cognitive trade-offs between the efforts made and the usefulness of the resulting decision (Yang et al., 2018). In the present study, PVKLG represents this relationship. Accordingly, seven items were designed to explore participants' PVKLG. Table 1 shows sample items.

Table 1 Sample items of each construct

Dimension	Item
SDL attitude	If it is something I am interested in, I will try to understand it by myself no matter how difficult it is
	When a new concept or thing comes along, I like to explore it on my own
SDL approach	I regularly surf the Internet for new information about my studies
	When there are difficulties in using the learning system, I will find the best way to solve it by myself
PVKLG	It is important for me to know what new concepts I can learn in this course
	It is important for me to know what strategies I can use to learn more effectively in this course
Behavioral engagement	When I study online, I don't ask for leave without a reason
	When I study online, I will finish all my homework
Cognitive engagement	When I make mistakes in my online study, I will pay attention not to do it again
	When studying online, I take notes with well-structured headings
Emotional engagement	When I study online, I like to discuss with my classmates
	When studying online, I like to learn the extracurricular knowledge that the teachers provide

- *Engagement* Behavioral engagement, cognitive engagement, and emotional engagement were adopted and modified from the works of Jung and Lee (2018). Accordingly, the present study designed six items for behavioral engagement, six for cognitive engagement, and six for emotional engagement. Sample items are shown in Table 1.

Data Analysis

There were two phases of data analysis in this study, namely CFA and structural equation modeling (SEM). CFA examined the construct validity of the questionnaires and clarified the model fit, while SEM was used to explore the structure relationships existing between SDL, PVKLG, and online learning engagement. AMOS is commonly used software to perform SEM, because it can be used to verify the path relationships between potential variables. Thus, the model fit and path analysis were performed with AMOS 21.0 with maximum likelihood estimation.
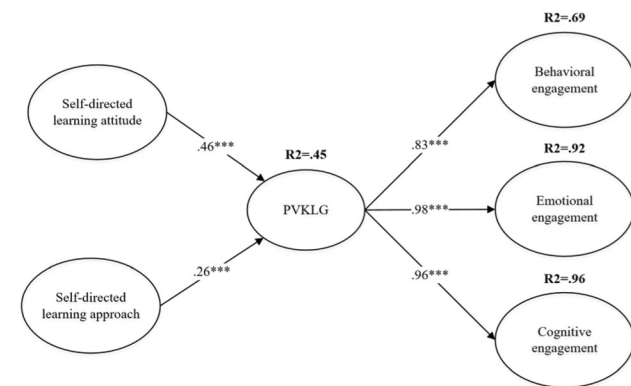
***p<0.001

Fig. 2 Verification of the research model (***$p < 0.001$)

Results

Questionnaire Item Analysis

This study conducted internal and external validity analyses to reduce the number of items in each construct. Firstly, items with a factor loading (FL) of less than 0.5 were deleted and then we deleted the highest residual value of each construct until the threshold of first-order CFA was met, as suggested by Hair et al. (2019). Then, we conducted independent t tests with the extreme value method to explore the t value of each construct. All t values surpassed 3 and were significant. Table 2 shows the results of each construct, which indicates that there was good external validity for each item.

Reliability and Validity Analyses

To test the reliability and validity of the instrument, the internal consistency of constructs was examined by Cronbach's alpha, and the external consistency of constructs was examined by composite reliability (CR). Table 2 shows that all alpha values ranged from 0.76 to 0.90 (above 0.50), and the overall alpha was 0.95. Additionally, all CR values in this study surpassed the threshold value of 0.7 (ranging from 0.74 to 0.90). Both internal and external consistencies were acceptable according to Hair et al.'s (2019) recommendations.

To test the convergent validity of the constructs, the average variance extracted (AVE) values and the FL of all constructs were tested. Table 3 shows that all AVE values exceeded 0.50 (ranging from 0.50 to 0.67) and all FL values were larger than 0.5 (see Table 2), which means that the convergent validity of the construct can be considered adequate (Hair et al., 2019). To test the discriminant validity between constructs, it is necessary to examine

whether the square root of the AVE is larger than the absolute value of the Pearson correlation coefficient between two constructs (Cheung & Wang, 2017). The results in Table 4 show that each construct has discriminative validity.

Model Fit Analysis

Researchers should consider absolute fit measures, incremental fit measures, and parsimonious fit measures to ensure a good model. The results show that $\chi^2/df = 2.78$, GFI = 0.90, AGFI = 0.87, and RMSEA = 0.06. The other values for the indicators of model fit are as follows: NFI = 0.91, TLI = 0.93, CFI = 0.94, and IFI = 0.94; all were larger than 0.90. Additionally, PNFI = 0.81 and

PGFI = 0.73. These indicators show satisfactory fitness of the final model (Hair et al., 2019).

Path Analysis

Path coefficients of the final model are shown in Table 5. SDL attitude was significantly correlated to PVKLG ($\beta = 0.46$, $t = 6.24***$), SDL approach was significantly correlated to PVKLG ($\beta = 0.26$, $t = 3.62***$), PVKLG was significantly correlated to behavioral engagement ($\beta = 0.83$, $t = 12.21***$), PVKLG was significantly correlated to cognitive engagement ($\beta = 0.96$, $t = 16.33***$), and PVKLG was significantly correlated to emotional engagement ($\beta = 0.98$, $t = 12.67***$). As reported in Table 6, the indirect effect of SDL attitude on behavioral

Table 2 Item analysis

	Internal validity				External validity
	χ^2/df < 5	GFI > 0.8	AGFI > 0.8	RMSEA < 0.08	t value
SDL attitude	0.27	0.92	0.99	0.00	18.95–22.51
SDL approach	–	0.90	–	–	20.01–24.24
PVKLG	–	0.93	–	–	15.89–21.96
Behavioral engagement	2.33	0.92	0.97	0.05	17.55–27.95
Emotional engagement	3.63	0.96	0.96	0.07	14.17–20.99
Cognitive engagement	2.72	0.95	0.97	0.06	18.47–21.28

Table 3 Reliability and validity analysis

Items	Mean –	SD –	CR > 0.7	Cronbach's α > 0.7	AVE > 0.5	FL > 0.5
SDL attitude	3.57	0.74	0.84	0.83	0.56	0.75
SDL approach	3.24	0.92	0.76	0.76	0.51	0.71
PVKLG	3.87	0.75	0.74	0.85	0.50	0.70
Behavioral engagement	3.96	0.80	0.90	0.90	0.65	0.80
Emotional engagement	3.93	0.73	0.89	0.89	0.67	0.82
Cognitive engagement	3.79	0.69	0.83	0.83	0.50	0.70

Table 4 Construct discriminant validity analysis

	1	2	3	4	5	6
SDL attitude	**0.75**					
SDL approach	0.55	**0.71**				
PVKLG	0.53	0.45	**0.70**			
Behavioral engagement	0.44	0.41	0.61	**0.81**		
Emotional engagement	0.50	0.43	0.68	0.74	**0.82**	
Cognitive engagement	0.52	0.45	0.69	0.73	0.81	**0.71**

Table 5 Path analysis

Path	Standardized coefficient (β)	SE	t value	Supported?
SDL attitude → PVKLG	0.46	0.06	6.24***	Yes
SDL approach → PVKLG	0.26	0.05	3.61***	Yes
PVKLG → Behavioral engagement	0.83	0.07	12.21***	Yes
PVKLG → Cognitive engagement	0.96	0.07	16.33***	Yes
PVKLG → Emotional engagement	0.98	0.08	12.67***	Yes

***$p < 0.001$

Table 6 Indirect effect analysis

	SDL attitude		SDL approach	
	β	95% CI	β	95% CI
Behavioral engagement	0.28**	[0.22, 0.84]	0.02	[0.02, 0.54]
Cognitive engagement	0.20**	[0.28, 0.97]	0.06	[0.02, 0.62]
Emotional engagement	0.21**	[0.24, 0.93]	0.12	[0.02, 0.60]

**$p < 0.01$

engagement is $\beta = 0.28$, the indirect effect of SDL attitude on cognitive engagement is $\beta = 0.20$, the indirect effect of SDL attitude on emotional engagement is $\beta = 0.21$, the indirect effect of SDL approach on behavioral engagement is $\beta = 0.02$, the indirect effect of SDL approach on cognitive engagement is $\beta = 0.06$, and the indirect effect of SDL approach on emotional engagement is $\beta = 0.12$. Additionally, each 95% confidence interval (CI) did not include zero, which means that the indirect effect existed in this research model, and there is a mediation effect for each path (see Fig. 2).

Discussion

Based on SEVT, this study explored whether different aspects of students' SDL in online learning situations could significantly predict their learning engagement with PVKLG as a mediator. Accordingly, this study explored those correlations between SDL attitude and approach, PVKLG, as well as three dimensions of learning engagement, and found that all constructs were positively related. The detailed results of this study are further illustrated below.

In examining H1, the result of the present study showed that participants' SDL attitude positively related to PVKLG. When students have a positive attitude towards SDL, they need a relatively clear learning goal (Ames & Archer, 1988). This result is supported by the study of Jufrida et al. (2019) which argued that students have negative attitudes toward physics, so they do not consider

learning goals in advance as having task or attainment value. In line with this, H1 was positively supported.

For hypothesis H2, this study revealed that participants' SDL approach positively related to PVKLG. With the SDL approach, learners tend to effectively plan for their learning; meanwhile, they may also change learning strategies according to their targets, until they achieve their goals (Littlejohn et al., 2016). Kizilcec et al. (2017) found that online learners who have their own learning approaches and participate in the process of setting learning goals are more likely to achieve their goals. Consistent with these assertions, H2 was positively supported.

To test hypothesis H3, this study shows that participants' PVKLG was positively related to their behavioral engagement. When students emphasize their learning goals, they will choose the strategies needed to achieve goals; they are then more likely to have positive behavioral engagement (Chang et al., 2018; Daniels et al., 2021). The result of this study is consistent with the study of Gonida et al. (2009) which suggested that the perceived value of learning goals and having a strong learning goal orientation can positively predict students' behavioral engagement. Accordingly, H3 was positively supported.

The result of H4 testing indicated that the participants' PVKLG was positively related to their emotional engagement. After setting learning goals, students tend to show positive emotions and are willing to participate in their learning processes, because they are able to help them achieve their learning goals (Mih et al., 2015). Cho (2014) found that perceiving the value of learning goals can promote online learners' emotional engagement. Conclusively, H4 was positively supported.

In examining H5, the results reported that participants' PVKLG positively related to their cognitive engagement. Cognitive engagement is one of the important factors used to evaluate the quality of learners' online learning (Shukor et al., 2014). Previous studies have demonstrated that if learners emphasize the learning goals, their efforts to achieve them can stimulate their deep cognitive engagement in the learning process (Daniels et al, 2021; Lee & Koszalka, 2016). Consistent with these studies, H5 was positively supported.

In testing H6, this study showed that SDL attitude and approach positively related to learning engagement mediated by PVKLG. Voss and Richards (2016) noticed that when learners positively engage in learning, their learning process becomes more self-directed. With a high level of SDL, students are often willing to devote themselves to learning and even more, want to know what knowledge or skills they can acquire from the course (Jung & Lee, 2018). Additionally, this study viewed PVKLG as a mediator variable; when learners had a high level of PVKLG, they would regulate their learning approaches according to the learning goals to promote their engagement in learning. Conclusively, H6 was positively supported.

Kirk-Johnson et al. (2019) emphasized that understanding the attitude and processes behind learners' decisions to engage more in learning is essential when conducting online learning courses. Based on SEVT, the present study aimed to explore the direct relationships between the approach and attitude of SDL and PVKLG, and PVKLG for predicting students' online learning engagement, and indirect relationships between two types of SDL and three types of online learning engagement during COVID-19. In conclusion, the path in the research model was verified and indicated that the direct effects and indirect effects between SDL attitude and approach, PVKLG, and the three types of learning engagement were positively supported through SEM.

Conclusion

Learners need to know what goals they want to achieve before they decide in what order to study, which indicates that knowing the learning goals plays an important role in learners' efforts in online learning; that is, there is no online learning without autonomy and there is no autonomy without knowing the learning goals (Hein et al., 2020). To understand the role of knowing learning goals, this study adopted PVKLG as the mediating variable related to the SEVT to verify the correlates between the two types of SDL and the three types of learning engagement. The results indicate that PVKLG is a critical mediating factor influencing online learning engagement.

Learners who not only know the learning goals but also perceive that they know the learning goals are more likely to engage in online learning.

Implications and Recommendations

Compared to previous studies, the findings of this study contribute to the current research by exploring the relationship between SDL and engagement mediated by PVKLG, guided by SEVT. The present study is the first attempt to subdivide SDL into SDL attitude and SDL approach; of course, this will advance our understanding in future SDL research. Furthermore, this study implies that letting students realize the importance of perceiving the value of knowing learning goals can help them achieve the teaching goals during the COVID-19 lockdown. Accordingly, it is suggested that teachers should inform students' PVKLG before beginning online teaching.

One recommendation is made according to SVET: informing learners of course goals and clarifying the goals can help cultivate their value perception of the learning goals. Instructors should consider how to enhance students' awareness of the learning goals, in particular, when students need to engage in distance learning during pandemic periods.

Limitations and Future Study

There are some limitations to this study that should be noted. First, the subjects might not have been actively participating in online courses at the time they completed the questionnaires, and their previous online learning experience might not have been so clear. To address this issue, future studies may use purposive sampling and focus on students in particular online courses to test the relationships among the constructs in this study. Second, this study indicates that PVKLG plays an important mediating role between SDL and online learning engagement; therefore, PVKLG may also play a critical role in mediating SDL and learning engagement in face-to-face learning. Future studies may examine the role of PVKLG in face-to-face contexts and compare it with online contexts.

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