How Online Task Value and Collaboration Preference Affect Learning Engagement in Flipped Learning: Mediating Effects of Self-Regulated Learning Ability[a]

Xueying Cui
Master, Chung-Ang University, Korea

Hae-Deok Song[b]
Professor, Chung-Ang University, Korea

YeonKyoung Kim
Research Professor, Chung-Ang University, Korea

Jung Won Hur
Associate Professor, Auburn University, USA

Abstract

This study aims to analyze the degree that online task value and collaboration preference can predict learning engagement, and to verify the mediating effects of self-regulated learning ability in flipped learning. This was done in terms of both pre-class and in-class of flipped learning, which are actively applied in higher education. To this end, a survey of 220 college students taking a flipped learning class at C University in Seoul was conducted. The study's findings showed that online task value and collaboration preference had a significant effect on learning engagement, while also predicting self-regulated learning ability. Self-regulated learning ability was found to affect learning engagement, and was also found to partially mediate the relationships of both online task value and collaboration preference in relation to learning engagement.

Keywords: Flipped learning, online task value, collaboration preference, self-regulated learning ability, learning engagement

[a] This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2017S1A3A2066878), and was developed based on first author's masters' thesis.

[b] Corresponding author: Hae-Deok Song, Professor, Chung-Ang University, 84 Heukseok-ro, Dongjak-gu, Seoul, 06974, Korea. E-mail: hsong@cau.ac.kr

Received: 2 Dec 2019, Revised: 2 Dec 2019, Accepted: 11 Dec 2019
http://dx.doi.org/10.34226/gcl.2019.9.6.93

Introduction

Universities are currently applying flipped learning actively as a learner-centered method (Han, Lim, Han, & Park, 2015; Kim, Chun, & Choi, 2014; Leem, 2016). Flipped learning has a structure where learners are introduced to online content before class, and then, in the classroom they work through related activities with their peers (Hamdan, McKnight, McKnight, & Arfstrom, 2013). Flipped learning is not a simple combination of online and offline learning. It is different from traditional blended learning (Baepler, Walker, & Driessen, 2014) because it offers a new way to realize learner-centered education that enhances higher-order thinking skills and academic performance through the use of technology (Bergmann & Sams, 2014; Park, 2018).

Due to the characteristics of flipped learning, the outcomes of flipped learning are very important (Bergmann & Sams, 2014; Lai & Hwang, 2016; Mason, Shuman, & Cook, 2013; Strayer, 2012; Wilson, 2014; Yeung & O'Malley, 2014). A number of studies have reported that improving learning engagement is key outcome of such a learning environment (Kim, 2018; Kim, Kim, Khera, & Getman, 2014; Lee, Park, Kang, & Park, 2014; Mclaughlin et al., 2013; Park & Kim, 2016). Thus, to effectively implement flipped learning in higher education settings, it is necessary to identify antecedent variables that promote learning engagement (Yoon, Cho, & Kwon, 2016). Given that flipped learning consists mainly of pre-class learning and classroom learning, learners' challenges in these stages of flipped learning need to be addressed.

One challenge in promoting academic engagement is learners' readiness to engage in pre-class learning. Several flipped learning studies have shown that learners may feel burdened by online pre-class learning, and consequently participate in classroom activities without having truly engaged in pre-class learning, resulting in low levels of learning engagement (Chen, Wang, Kinshuk, & Chen, 2014; Kim et al., 2014). In pre-class learning, learners absorb content by interacting with the materials provided (Lee, 2011), which is why it is important for learners to have initiative and take responsibility for their learning. As online interactions with instructors are limited (Garrison, Anderson, & Archer, 2000), it is important for learners to control their own learning processes and participate in pre-class learning. Related research has shown that learners' perceived task values play an important role by affecting learning engagement in online environments (You & Song, 2013). The task value, which is the learner's motivational variable, is the subjective value in which the learner feels that the content is worthwhile (Wu & Hiltz, 2004) and thus, enabling the student to actively participate in the learning can help them continue learning, and further pursue learning tasks in the future. This means that if a learner does not feel that the learning task they are doing is fun or important, they do not continue learning and give up halfway through (Packham, Jones, Miller, & Tomas, 2004). On the other hand, if they add value to the learning task they are doing, an active learning engagement can be formed (Kwon & Choi, 2018).

Another challenge in promoting learners engagement is learners' attitude in classroom

learning activities. Unlike online pre-class learning, where learners study individually using online learning materials, collaborative learning mainly takes place in an offline classroom. Studies on collaborative learning show that the learners' attitude to the process of collaboration is an important factor to success, and similar trends have been observed in flipped learning (Bishop & Verleger, 2013; Tucker, 2012). In the flipped learning classroom lessons, a learner's leadership ability is emphasized, while their willingness to collaborate in learning is also a key factor (Lim, Jin, Kim, & Jo, 2016. O'Flaherty & Phillips, 2015). This can be explained by the concept of collaboration preference, which refers to the inclination of learners to strive to achieve their team's common goals in a cooperative learning environment (Johnson & Johnson, 2003). Kirschner, Paas, & Kirschner (2009) have also noted that collaboration can have a positive impact on learning engagement in the learning process, helping learners to retain information for long periods of time while simultaneously developing a high level of skill. In other words, collaboration preference affects attitudes toward learning, which affects cognitive learning engagement; this in turn affects academic achievement (Kirkman & Shapiro, 2001; Lee, 2016).

Previous studies have cited the importance of self-regulated learning ability related to learner characteristics as a key factor of learning engagement in learner-centered methods of instruction, such as flipped learning (Cha & Eom, 2015; Goo & Yang, 2013; Järvelä, Järvenoja, Malmberg, Isohätälä, & Sobocinski, 2016). Self-regulated learning ability is the learners ability to control their cognition, motivation, and behaviors to solve learning tasks (Pintrich & DeGroot, 1990) and to actively participate in learning in terms of metacognitive, motivational, and behavioral factors (Zimmerman, 1990). Learners perform their own tasks by understanding the material on their own and checking for gaps in pre-class learning. Therefore, the learner should monitor the overall learning process and establish a learning strategy for effective learning. In addition, learners are also required to have self-regulatory skills needed to facilitate the progress of learner-centered learning activities in the classroom (Lee, Noh, & Chung, 2016; Sletten, 2015). Previous studies have shown that perceived task is closely related to self-regulation (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990). Pintrich and his coworkers noted in their study that learners' task value is a predictor of self-regulation (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990). Self-regulated learning skills can also be developed in collaborative learning, as well as in individual learning (Hadwin, Järvela, & Miller, 2011; Schunk & Zimmerman, 1997). Most learners perform self-regulated learning when studying in small groups of two or more people better than when they learn by themselves or when being taught by instructors (Perry, 1998; Perry, VandeKamp, Mercer, & Nordby, 2002).

According to the above findings, it is likely that the task value of the online class, collaboration preference in the offline class, and self-regulated learning ability at all stages of flipped learning are important factors that predict an individual's engagement. Therefore, this study analyzes the degree to which online task value and collaboration preference predict learning engagement in flipped learning, while also examining self-regulated

learning ability as a mediating variable. By exploring the structural relationships between online task value, collaboration preference, self-regulated learning ability, and learning engagement, it is expected that this study will be able to indicate potential directions for designing instructional strategies that facilitate learning engagement in flipped learning.

Theoretical background

Flipped learning and learning engagement

Learning engagement, which indicates how voluntarily and actively an individual participates in learning, is recognized as an important factor for predicting learning outcomes (Kim, 2018; Kim et al., 2014). Engagement plays an important role in both learning and academic achievement, and research on this topic is ongoing (Kahu, 2013). In general, "engagement" has been interpreted as "participation," but "engagement" in the learning environment means that the learner's level of participation in activities is intensified (Schaufeli & Salanva, 2007; Steele & Fullagar, 2009). This study defines learning engagement as the quality of the effort and mental energy of learners in attempting to achieve the desired learning outcomes, using the contents defined by Hu and Kuh (2002).

Learning engagement is reported to consist of three multidimensional recruitments (Appleton, Christenson, Kim, & Reschly, 2006; Fredricks, Blumenfeld, & Paris, 2004; Handelsman, Briggs, Sulivan, & Towler, 2005). First, cognitive engagement refers to cognitive efforts to adjust behaviors in order to meet learning goals, such as learners planning their own learning and using cognitive strategies (Appleton et al., 2006). Second, emotional engagement implies either a desire for learning or a passion and interest in using the knowledge in question (Appleton et al., 2006; Handelsman et al., 2005). The third, behavioral engagement is represented by behavioral indicators, such as participating in discussions or asking questions in class, which are easy to observe compared to other engagement factors because they can be observed externally (Handelsman et al., 2005).

Considering that the teaching stage of flipped learning includes three stages (before, during, and after class), it can be expected that learning engagement will be different for each stage. Flipped learning consists of individual learners' online learning in the pre-class and the students' interaction in classroom learning (Bishop & Verleger, 2013). Therefore, in order for learners to immerse themselves in flipped learning successfully, the pre-class level requires lesson plans for sufficient pre-class learning, monitoring of the learning process, putting the plans into action, and conducting further studies. Efforts should be made to both maintain self-directed learning and maintain motivation for learning by linking pre-class learning contents with existing knowledge or interests. In the flipped learning classroom, students learn how to apply knowledge by solving real problems rather than repetitive tasks; in particular, they need to be immersed in helping each other to feel the differences between

conventional learning and flipped learning while working as a team (Im, Kang, Lee, & You, 2016; Lee & Youn, 2017).

Flipped learning and task value

Task value refers to the student's evaluation of how important, useful, and interesting the task is (Eccles & Wigfield, 1995). Pintrich (1999) suggests that students who value learning tasks tend to have higher learning performance. Task value is also a predictor of academic effort and subsequent achievement (Cole, Bergin, & Whittaker, 2008; Lawanto, Santoso, Goodridge, & Lawanto, 2014). Students who find learning tasks worthwhile, are more likely than other students to use deeper cognitive and metacognitive strategies, and to successfully perform the learning task (Neuville, Frenay, & Bourgeois, 2007). In flipped learning, the level of task value among the learners has a significant effect on pre-class learning participation, in-class learning participation, and learning satisfaction (Kwon & Chung, 2018). These results are consistent with the findings of previous studies which show that task value has a significant effect on both learning participation (You & Song, 2013; Jeong, 2012) and learning satisfaction (Ha, 2010; Lee & Yoon, 2012) in the online environment. In particular, knowledge is not simply acquired, but is applied and synthesized through various tasks during the process of flipped learning. At this point, learners should believe that the online task they are performing is important and beneficial for achieving positive results in the offline class component of flipped learning. In this regard, instructors should develop and apply strategies to increase learners' sense of task value in flipped learning (Kwon & Chung, 2018).

Flipped learning and collaboration preference

Flipped learning begins with an online video lecture course where students learn concepts and then subsequently solve problems through discussion and collaboration with fellow learners in classroom-based sessions. Therefore, the way that the learner's attitude is formed toward the process of collaboration in classroom instruction can be an important factor in determining learning outcomes (Bishop & Verleger, 2013; Tucker, 2012). According to Lee's (2019) study, after applying flipped learning that utilizes collaborative activities and interactions, such as various discussion activities between learners in the classroom, learners feel more comfortable learning together and actually prefer collaborative learning overall. In other words, flipped learning can enhance the collaboration preference of learners. In addition, it was also reported that flipped learning has a higher impact on learners with a high collaboration preference in terms of their learning plan subfactors, such as self-directed learning ability. That is, in cases with high collaboration preference levels, the flipped learning process enables learners to improve their ability to diagnose learning needs, set goals for themselves, and identify resources for learning.

Flipped learning and self-regulated learning

Learners' self-regulated learning ability is a major variable in measuring learning performance (Park, Lee, & Song, 2007). In flipped learning, learners compose strategies, such as understanding learning materials and adjusting learning speed. In this regard, self-regulated learning is considered to be a very important factor for success (Sletten, 2015). In the pre-class stage of flipped learning, learners adjust both their learning ability and how much they learn in daily life or in school according to their learning ability when they need to absorb the various learning materials provided by the instructor. In particular, it is possible to proceed with learning by applying the learning method in various ways that are most suitable for the individual in the process of pre-class learning, self-assessment, and mutual confirmation, rather than only through media-based learning (Jung, 2017). In this sense, flipped learning and self-regulated learning ability can be viewed as interconnected. Seo (2015) reports on learners' various learning abilities and self-regulated learning abilities in flipped learning classes in college. In particular, studies by Hamdan et al. (2013) have found that in flipped learning, instructors can create videos or screencasts and upload them online, enabling learners to proceed according to their individual learning ability or speed. In other words, flipped learning assists students to modulate their learning curve. Kim (2015) found that learners in actual classroom environments have discussions and debates, conduct project learning, and solve problems based on what they learn, and that these activities eventually lead to increased initiative, responsibility, and interaction regarding their own learning, thus improving their self-regulation ability.

Relationship between Variables

According to a previous study on online learning, conducted on prior research into flipped learning, the task value perceived by learners is expected to influence learning engagement (You & Song, 2013). The task value, the learner's motivational variable, plays a crucial role in encouraging active participation in learning activities, continuing learning activities, and then development of the field of learning. This means that if a learner does not feel that the learning task they are doing is fun or important, they will not continue learning and give up halfway through (Packham et al., 2004); if they perceive value in the learning task they are doing, active learning engagement can form (Kwon & Choi, 2018). In addition, the value of learners' tasks is closely related to self-regulation (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990), and Pintrich and his colleagues noted in their study targeting college students that learners' perception of task value is a predictor of self-regulation (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990).

Meanwhile, Kirschner, Paas, & Kirschner (2009) have noted that collaboration has a positive effect on learning engagement in the learning process, helping learners to retain information for a long time while simultaneously acquiring a high level of skill. Collaboration preference also affects attitudes toward learning, which affects both cognitive

learning engagement and, in turn, academic achievement (Kirkman & Shapiro, 2001; Lee, 2016). Therefore, learners who are highly collaboration-oriented tend to learn and participate actively and successfully in the collaborative activities that form part of learning process, and collaboration preference is applied as predictable variables in learning outcomes. In terms of the offline classroom learning component of flipped learning, self-regulated learning ability can be developed not only in individual learning, but also in collaborative learning (Hadwin, Järvela, & Miller, 2011; Schunk & Zimmerman, 1997). Many learners have reported increased self-regulation of learning when forming small groups of two or more people as opposed to when studying alone or with teacher guidance (Perry, 1998; Perry et al., 2002). In addition, according to previous studies, self-regulated learning ability is expected to have a mediating effect on the relationship between online task value and learning engagement and on the relationship- between collaboration preference and learning engagement (Goo & Yang, 2013; Järvelä et al., 2016).

Research model and hypotheses

Based on prior research, this study assumes that both online task value and collaboration preference have a direct influence on learning engagement. We also assume that online task value and collaboration preference indirectly influence learning engagement through the self-regulated learning ability. A structural equation model is used to investigate the relationship between online task value, collaboration preference, self-regulated learning ability, and learning engagement. In this study, online task value and collaboration preference were set as independent variables, while self-regulated learning ability was set as the mediating variable with learning engagement as the dependent variable. The research model that illustrates the relationships between the variables is shown in Figure 1. The model reflects the following four research hypotheses:

H1. Online task value and collaboration preference have direct effects on self-regulated learning ability in flipped learning.

H2. Online task value and collaboration preference have direct effects on learning engagement in flipped learning.

H3. Self-regulated learning ability has direct effects on learning engagement in flipped learning.

H4. Self-regulated learning ability has a mediating effect on the relationships between (1) online task value and collaboration preference and (2) learning engagement in flipped learning.

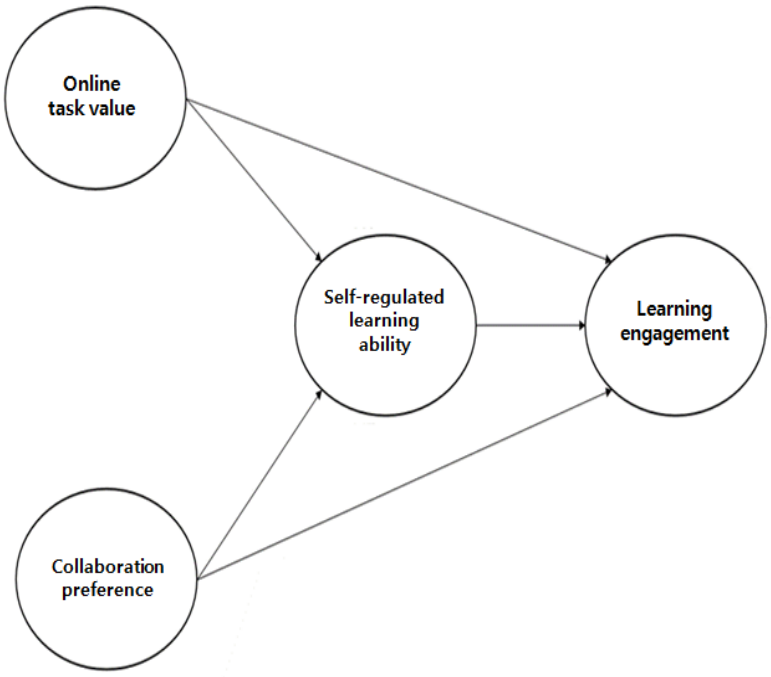

Figure 1. Research model

Method

Participants and data collection

This study conducted an online and offline survey in May 2019 involving 220 college students who participated in a flipped learning class which opened at a 4-year "C" university in Seoul. The flipped learning classes for the survey were selected by a syllabus. All flipped learning classes consisted of online lecture contents and offline activities such as problem solving, case study, and discussion. Before the survey, the instructors who ran the flipped learning classes were notified of the purpose and contents of the study by e-mail, and the suitability of the use of flipped learning in terms of this study was confirmed.

The final number of participants in the survey was 220, with 109 males (49.5%) and 111 females (50.5%). In terms of the distribution of grades, the third grade was the highest with 109 (49.5%), followed by 39 fourth graders (17.7%), 37 second graders (16.8%), and 35 first graders (15.9%). Among the respondents, nursing and management economy majors were most accounted for, with 69 respondents (31.4%), followed by 48 in the college of education (21.8%) and 28 in the natural sciences (12.7%).

Instruments

In this study, a questionnaire was used to measure online task value, collaboration preference, self-regulated learning ability, and learning engagement level in flipped learning. The measurement instrument for each variable was used by modifying the questions used in a previous study. The revised questions were reviewed by three educational engineering experts.

For online task value as the preliminary variable, we used six questions developed by Artino and McCoach (2008) for use in online classes; for collaboration preference, questions developed by Johnson and Johnson (2003) were used, while seven questions translated by Yoon (2007) were also used. For self-regulated learning ability as the mediator variable, MSLQ, designed by Pintrich and DeGroot (1990) and modified and translated by Ha (2005), was used. The self-regulatory learning ability measurement tool is divided into 18 items split into three sections (3 items for cognitive self-regulated learning ability, 10 for meta-cognitive self-regulated learning ability, and 5 for resource management self-regulated learning ability). In terms of learning engagement—the dependent variable—we used You's (2011) measurement tools, who translated the questions of Handelsman et al. (2005) by modifying them to fit the context of flipped learning. The learning engagement measurement tool consists of a total of 20 items split into three sub-factors (9 items for cognitive engagement, 5 for emotional engagement, and 6 for behavioral engagement). We used Likert's 5-point scale (1 = not at all, 5 = very much) to measure all the questions.

Data analysis

The analysis was carried out as follows. First, frequency analysis was conducted to confirm the demographic characteristics of survey respondents. Second, the reliability and validity of the measurement tools were verified through confirmatory factor analysis and reliability analysis. Third, descriptive statistics were calculated to examine normality. Fourth, Pearson correlation analysis was conducted to find the correlation between variables. Fifth, to verify the research problem, the structural equation model was set up and the path analysis was performed. The mediating effect was verified using the Bootstrapping technique.

Results

Descriptive statistics and correlation analysis

For structural equation analysis, the normal distribution of collected data was first verified. For the normal distribution test, the mean, standard deviation, skewness, and kurtosis of each variable were checked. As shown in Table 1, the mean of the variables

ranged from 3.22 to 3.91, with standard deviations ranging from .55 to 1.01. The absolute value of the skewness was distributed between .08 and .88, while the kurtosis was between .02 and .97. Because the absolute value of the skewness is less than 2 and the absolute value of the kurtosis is less than 7, the current data met the assumption of multivariate normal distribution (Curran, West, & Finch, 1996). To analyze the relationship among measurement variables to be used for structural equation model analysis, correlations among measurement variables were examined. The correlations between the variables ranged from .22 to .77, with all the results statistically significant. There was no multicollinearity problem as all variance inflation factors (VIF) were lower than 10.

Assessment of measurement model

Before verifying the research model, we calculated the goodness-of-fit indices for the measurement model using maximum likelihood estimation. The results showed that the measurement model had a good fit with the collected data (*RMSEA*=.069, *SRMR*=.0401, *CFI*=.949, *TLI*=.940). Looking at the evaluation criteria of the main goodness-of-fit indices, the *RMSEA* and *SRMR* values are considered suitability good if lower than .05 and suitability acceptable if lower than .08. If the *CFI* and *TLI* values are approximately .9 or above, the model is considered appropriate (Browne & Cudeck, 1993; Kline, 2011; Schermelleh-Engel, Moosbrugger, & Müller, 2003).

In this study, convergent validity was assessed by factor loading and Average Variance Extracted (*AVE*). The factor loadings ranged from .70 to .87 and AVEs ranged from .67 to .82, indicating good convergent validity, since all of the factor loadings and AVEs were higher than .50. All of the correlations between the latent variables were lower than .90 (ranged from.46~.74), thereby affirming the discriminant validity among latent variables (Kline, 2011).

Table 1. Descriptive Statistics and Correlations for variables

Measurement Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
OTV(1)	1																		
OTV(2)	.666**	1																	
OTV(3)	.585**	.647**	1																
OTV(4)	.535**	.623**	.737**	1															
OTV(5)	.553**	.595**	.688**	.774**	1														
OTV(6)	.589**	.675**	.586**	.636**	.632**	1													
CP(1)	.300**	.328**	.311**	.364**	.359**	.351**	1												
CP(2)	.282**	.349**	.356**	.318**	.334**	.341**	.772**	1											
CP(3)	.222**	.271**	.301**	.235**	.266**	.287**	.634**	.723**	1										
CP(4)	.305**	.359**	.346**	.328**	.365**	.379**	.654**	.669**	669**	1									
CP(5)	.275**	.333**	.340**	.340**	.362**	.405**	.660**	.682**	.656**	.721**	1								
CP(6)	.256**	.299**	.253**	.287**	.311**	.267**	.560**	.528**	.593**	.597**	.631**	1							
CP(7)	.295**	.377**	.326**	.298**	.326**	.333**	.576**	.523**	.529**	709**	.669**	.613**	1						
LE(1)	.319**	.403**	.445**	437**	.450**	.477**	.418**	.382**	.387**	.424**	.389**	.319**	.457**	1					
LE(2)	.335**	.381**	.514**	.486**	.487**	.388**	.468**	.514**	.524**	.466**	.503**	.448**	.459**	.644**	1				
LE(3)	.406**	.421**	.479**	.497**	.492**	.425**	.414**	.417**	.396**	.431**	.473**	.417**	449**	644**	.762**	1			

SLE(1)	.478**	.467**	.522**	.531**	.523**	.492**	.423**	.385**	.334**	.401**	.389**	.344**	.345**	.536**	.606**	.606**	1		
SLE(2)	.447**	.463**	.568**	.575**	.558**	.492**	.483**	.503**	.454**	.447**	.509**	.442**	.382**	.550**	.633**	.620**	.597**	1	
SLE(3)	.314**	.396**	.502**	.507**	.489**	.421**	.500**	.553**	.509**	.487**	.511**	.394**	.401**	.472**	.629**	.593**	.641**	.726**	1
Mean	3.83	3.87	3.61	3.77	3.78	3.91	3.34	3.41	3.38	3.61	3.57	3.47	3.65	3.68	3.22	3.22	3.76	3.37	3.46
S.D	.888	.874	1.016	.985	.910	.879	.954	.973	.926	.871	.921	.990	.941	.716	.918	.805	.771	.550	.600
Skewness	-.531	-.818	-.563	-.888	-.726	-.644	-.348	-.370	-.263	-.333	-.287	-.423	-.540	-.344	-.145	-.196	-.491	-.116	.085
Kurtosis	-.153	.978	0.063	.671	.646	.243	108	-.131	.042	.053	-.122	-.148	.247	-.278	-.522	-.58	.424	.744	.024

Note: n= 220, ** p<.01

OTV= Online task value, CP= Collaboration preference, LE(1)=Cognitive learning engagement, LE(2)=Emotional learning engagement, LE(3)=Behavioral learning engagement, SLE(1)= Cognitive self-regulated learning ability, SLE(2)= Meta-cognitive self-regulated learning ability, SLE(3)= Resource management self-regulated learning ability

Validation of research model

As a result of verifying the research model, the research model showed good fit with the collected data as judged by the suggested criteria (*RMSEA*=.069, *SRMR*=.040, *CFI*=.949, *TLI*=.940). Based on the result of conducting the path analysis of latent variables to examine the relationship between the variables, the influence of the relationships between all of the variables was significant (see Table 2). First, the standardization coefficient of online task value regarding self-regulated learning ability was .494 and was thus found to have positive influence (p<.001). Second, the standardization coefficient of online task value on learning engagement was .347, which can be interpreted as statically significant (p<.001). Third, the standardization coefficient of collaboration preference on self-regulated learning ability was .496 (p<.001). Fourth, collaboration preference had a positive effect on learning engagement and had a standardization coefficient of .212 (p<.01). Fifth, self-regulated learning ability had a positive effect on learning engagement and a standardized coefficient of .553 (p<.001).

Table 2. Path coefficients of the structural model

Path	Estimates (B)	Standardized Estimates(β)	*S.E.*	*C.R.*
self-regulated learning ability ← online task value	.415***	.494	.064	6.473
self-regulated learning ability ← collaboration preference	.368***	.496	.055	6.682
learning engagement ← online task value	.274***	.347	.057	4.804
learning engagement ← collaboration preference	.148**	.212	.047	3.175
learning engagement ← self-regulated learning ability	.518***	.553	.088	5.884

** p<.01, *** p<.001

Mediation analysis

After verifying the relationships between the variables, the direct, indirect, and total effects were verified by decomposing the effects of the research model (see Table 3). First, direct effects mean that independent variables directly affect dependent variables. Next, indirect effects, unlike direct effects, imply an influence between independent and dependent variables through intermediate variables, which are called mediating variables. Finally, total effect refers to the sum of the direct and indirect effects (Yu, 2012). Variables can be considered to have mediating effects when independent variables are judged to have significant indirect effects on dependent variables. To verify this, Bootstrapping was extracted 5,000 times in total and mediated.

The effects of online task value and collaboration preference on learning engagement and direct effects, as well as the indirect effects on the verification of the mediating effects of self-regulated learning ability, are as follows. First, among the total effects of online task value on learning engagement, the direct effect on online engagement value was .347 (p<.001). The indirect effect on learning engagement through self-regulated learning ability, which is an online variable of task value, was .273 (p<.001). Therefore, self-regulated learning ability, which is a mediator in the relationship between online task value and learning engagement, was found to have a partial mediating effect. Next, out of the total effects of collaboration preference on learning engagement, the direct effect of collaboration preference on learning engagement was .212, and was statistically significant (p<.01). The indirect effect of collaboration preference on learning engagement through self-regulated learning ability as a mediating variable was .274 (p<.001). Therefore, self-regulated learning ability, which is a mediator in the relationship between collaboration preference and learning engagement, was found to have a partial mediating effect.

Table 3. Total, direct, and indirect effects among variables

Variables	Direct Effect)	Indirect Effect	Total Effect
self-regulated learning ability ← online task value	.497***	-	.494***
self-regulated learning ability ← collaboration preference	.496***	-	.496***
learning engagement ← online task value	.347***	.273***	.620***
learning engagement ← collaboration preference	.212**	.274***	.486***
learning engagement ← self-regulated learning ability	.553***	-	.553***

** p<.01, *** p<.001

Based on the above results, the standardized coefficients and significant paths of the research model are presented in Figure 2.

The summary of the verification results for the research hypotheses is as follows. First, both online task value and collaboration preference in flipped learning have positive effects on learning engagement. Second, online task value and collaboration preference also have positive effects on self-regulated learning. Third, self-regulated learning ability positively influences learning engagement in flipped learning. Fourth, online task value and collaboration preference in flipped learning have positive effects on learning engagement by mediating self-regulated learning ability.

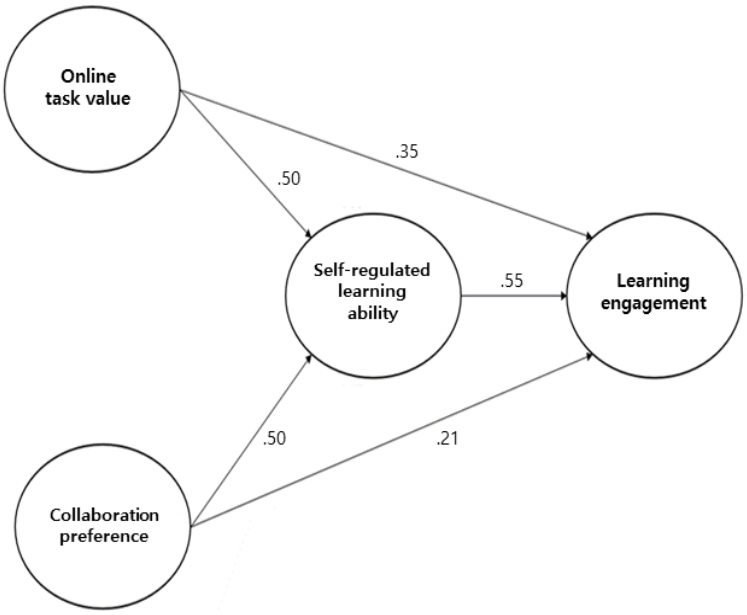

Figure 2. Research model with standardized path coefficients

Discussion and conclusion

Discussion

This study examined the structural relationship between online task value, collaboration preference, self-regulated learning ability, and the learning engagement of students. Findings shows that online task value and collaboration preference are factors influencing self-regulated learning ability. In other words, in the flipped learning environments, where the learner adjusts the online and offline learning process, the self-regulated learning ability of the learner is significant. Findings in this study are important in that they extend the outcome variables of flipped learning by considering learning engagement, as well as academic achievement, competency, and satisfaction. Based on the results of this study, the conclusions regarding instructional design aspects for successful implementation and diffusion of flipped learning are as follows.

First, this study verifies that online task value and collaboration preference are influential factors of self-regulated learning ability. The confirmation that online task value significantly influences self-regulated learning ability lines up with the findings of previous studies (Garcia & Pintrich, 1994; Pintrich & De Groot, 1990). Instructors need to recognize the importance of online task value and to promote self-regulated learning ability in the flipped learning environment. The results show that collaboration preference as a learner

variable has a significant direct effect on self-regulated learning ability in the offline class of flipped learning. In the offline class of flipped learning, learners work together to solve authentic problems or produce results; this implies that a high degree of collaboration preference will influence the self-regulated learning ability in flipped learning. Learners with a high degree of collaboration preference will actively participate in the offline class and manage, monitor, and self-reflect on their learning in order to complete a group task. This result also supports the findings from previous studies by Perry (1998) and Perry et al. (2002). However, due to a lack of relevant previous research, it is necessary to add further research regarding collaboration preference and self-regulated learning ability in the future.

Second, online task value and collaboration preference had a significant positive influence on learning engagement. This finding is consistent with previous studies by both You and Song (2013) and Kwon and Choi (2018). This also supports the idea that the task value as perceived by learners is an important factor in inducing learners to work and actively participate in classes (Marks, 2000; Newmann, Wehlage, & Lamborn, 1992). In other words, in flipped learning, the more value learners place on online pre-class tasks, the higher their level of learning engagement. Therefore, instructors need to design materials that are usefulness, important, and interesting when preparing online pre-classes. The finding that collaboration preference significantly influences learning engagement is consistent with prior studies (Kang et al., 2010; Long & Colden, 2006). It is also in line with Kim's (2018) finding that the higher the level of interaction among learners in flipped learning, the better the learning engagement. It further supports the results of Lim and colleagues (2016), who found that learners with high collaboration preference are more likely to engage in learning and prefer to participate in collaborative tasks. This is related to the result that active collaborative learning improves learning engagement in the classroom (Blasco-Arcas, Buil, Hernández-Ortega, & Sese, 2013). Therefore, in order to improve participation in flipped learning, it is necessary to prepare in-class activities that reflect learners' characteristics and to provide learning guidance for low-level learners by checking the collaboration preference of the learners.

Third, self-regulated learning ability has a significant effect on learning engagement in flipped learning. This result is meaningful in verifying the importance of the learner variable as an antecedent of student learning outcomes in flipped learning. Also this finding concurs with those of previous studies (Järvelä et al., 2016; Pellas, 2014; Sun & Rueda, 2012). If learners voluntarily and actively control the overall learning process in flipped learning, their learning engagement will be better. In other words, learners with high self-regulated learning abilities can expect higher levels of learning engagement; therefore, the instructors need to develop and apply strategies to increase learners' self-regulated learning ability in flipped learning.

Fourth, in the flipped learning environment, self-regulated learning ability significantly mediates the relationship between online task value and learning engagement. In other words, online task value not only has a significant positive influence on learning engagement, but

also has an indirect effect on learning engagement through the mediation of self-regulated learning ability. Therefore, when designing an online task, instructors need to develop strategies to increase learning engagement according to the learner's self-regulated learning ability level (Pellas, 2014; Sun & Rueda, 2012).

Last, self-regulated learning ability plays a mediating role between collaboration preference and learning engagement in flipped learning. That is, collaboration preference not only has a significant positive influence on learning engagement, but also has an indirect effect on learning engagement through the mediation of self-regulated learning ability. Learners may need to practice self-regulated learning skills to become more self-directed and learn effectively in flipped learning environments (Sletten, 2017). In addition, to encourage learning engagement, it is necessary to reinforce the role of the instructor as a facilitator in offline classes (Tawfik & Lilly, 2015). The instructor in flipped learning takes on a different role than in traditional lecture-based instruction (Hamdan et al., 2013). Their role becomes one of a facilitator who monitors learning progress and provides individualized support in consideration of collaboration preference and self-regulated learning ability. However, since there are not enough previous studies verifying the indirect relationship between collaboration preference, self-regulated learning ability, and learning engagement, it is necessary to actively conduct follow-up studies in order to clarify the structural relationship of this model.

Limitations and suggestions for future research

Based on the results of this study, suggestions for further research are as follows. First, the data were collected using convenience sampling method. The sample consisted of 220 students who participated in flipped learning classes from a single university. Therefore, it seems necessary to conduct follow-up studies that collect a larger sample with stronger statistical power.

Second, while the survey was on the experiences of flipped learning classes in various subjects, a limitation is that it does not strictly examine whether the individual flipped learning class experienced by the learners was properly designed and/or implemented. If flipped learning is not properly executed, it may be difficult to get the expected results, as instruction design, development, and implementation are highly important in flipped learning. Therefore, in future research, it is necessary to grasp the design and implementation level of flipped learning regarding individual learners, and then carefully select the subjects for research.

Third, the number of flipped learning classes experienced by learners who participated in the survey varied widely from one to five. Since it is possible that the number of flipped learning experiences had various effects on learning engagement, it is necessary to confirm empirically whether different results can be produced depending on the number of flipped learning classes undertaken. In subsequent studies, it is necessary to investigate the

relationship between accumulated flipped learning experiences and the learning engagement of those who experience flipped learning.

Fourth, this study was mainly based on students' self-reported perception of flipped learning. The questionnaire items were intended to measure thoughts, attitudes, preferences, and behaviors at the individual learner's level, which has limitations in terms of objectivity. For this reason, it is necessary to conduct in-depth studies on the factors affecting learning engagement by using case studies and interviews, as well as survey methods.

Finally, in this study, the variables of learner characteristics were selected as preceding factors and mediators to explore the effects on learning engagement. In terms of instructional design, it is necessary to consider a wide range of variables that may affect learning engagement. It is hoped that further discussions will be had to ensure that flipped learning is effectively designed and actively applied in higher education through more sophisticated empirical research.

References

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology*, *44*, 427-445.

Artino, A. R., & McCoach, D. B. (2008). Development and initial validation of the online learning value and self-efficacy scale. *Journal of Educational Computing Research*, *38*(3), 279-304.

Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education*, *78*, 227-236.

Bergmann, J., & Sams, A. (2014). Flipped *learning: Gateway to student engagement*. Eugene, OR: International Society for Technology in Education.

Bishop, J. L., & Verleger, M. A. (2013). *The flipped classroom: A survey of the research*. Proceedings of 120th American Society for Engineering Education Annual Conference and Exposition, 30, 1-18.

Blasco-Arcas, L., Buil, I., Hernández-Ortega, B., & Sese, F. J. (2013). Using clickers in class. The role of interactivity, active collaborative learning and engagement in learning performance. *Computers & Education*, *62*, 102-110.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. *Sage Focus Editions*, *154*, 136-136.

Cha, Y. M., & Eom, W. Y. (2015). Effects of self-regulated learning abilities of Junior college students on learning flow. *The Korean Journal of the Learning Sciences*, *9*(1), 83-105.

Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead*? Computers & Education*, *79*(11), 16-27.

Cole, J. S., Bergin, D. A., & Whittaker, T. A. (2008). Predicting student achievement for low stakes tests with effort and task value. *Contemporary Educational Psychology*, *33*(4), 609-624.

Curran, P. J., West. S. G., & Finch, J. F (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, *1*(1), 16-29.

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin*, *21*(3), 215-225.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-109.

Garcia, T., & Pintrich, P. R. (1994). Regulating motivation and cognition in the classroom: The role of self-schemas and self-regulatory strategies. In D. H. Schunk and B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp.127-153). Hillsdale, NJ: Lawrence Erlbaum Associates.

Garrison, D., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment. *The Internet and Higher Education*, *2*(2), 87-105.

Goo, Y. S., & Yang Y. S. (2013). A comparison study of learning style, self-regulated learning and learning flow between Gifted and normal student. *Journal of Gifted/Talented Education, 23*(2), 177-191.

Ha, Y. J. (2005). *Civil servants' motivation and self-Regulated learning capability as predictors of their satisfaction, achievement, and job involvement in relation to online job training* (Doctoral dissertation). Ewha Woman's University, Seoul, Korea.

Ha, Y. J. (2010). The effects of learning strategies and task value on learning satisfaction and academic achievement of online learners. *The Journal of Learner-Centered Curriculum and Instruction*, *10*(3), 577-598.

Hadwin, A. F., Järvela, S., & Miller, M. (2011). Self-regulated, co-regulated, and socially shared regulation of learning. In B. J. Zimmerman, & D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 65-84). New York : Routledge.

Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M. (2013). *The flipped learning model: A white paper based on the literature review titled A Review of Flipped Learning*. Flipped Learning Network. Retrieved from http://research network.pearson. com/wpcontent/uploads/WhitePaper_FlippedLearning.pdf

Han, H. J., Lim, C. I., Han, So. L., & Park, J. W. (2015). Instructional strategies for integrating online and offline modes of flipped learning in higher education. *Journal of Educational Technology*, *31*(1), 1-38.

Handelsman, M. M., Briggs, W. L., Sulivan, N., & Towler, A. (2005). A measure of college student course engagement. *The Journal of Educational Research*, *98*(3), 184-192.

Hu, S., & Kuh, G. D. (2002). Being (dis) engaged in educationally purposeful activities: The influences of student and institutional characteristics. *Research in Higher Education*,

43(5), 555-575.

Im, S. H., Kang, S. M., Lee, S. W., & You Y. M. (2016). A qualitative case study of flipped learning class on college students. *The Journal of Educational Information and Me*dia, *22*(4), 777-803.

Järvelä, S., Järvenoja, H., Malmberg, J., Isohätälä, J., & Sobocinski, M. (2016). How do types of interaction and phases of self-regulated learning set a stage for collaborative engagement?. *Learning and Instruction*, *43*, 39-51.

Jeong, E. I. (2012). Exploring the factors that influence college students' class participation: Focus on autonomy support, academic self-efficacy, and task value. *The Korean Journal of Educational Methodology Studies*, *24*(2), 355-378.

Johnson, D. W., & Johnson, F. P. (2003). *Joining together: Group theory and group skills*. Boston: Allyn and Bacon.

Jung, J. Y. (2017). The effect of the flipped learning on self-directed and self-regulation competence of pre-teacher students. *The Journal of Learner-Centered Curriculum and Instruction*, *17*(4), 215-235.

Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education*, *38*(5), 758-773.

Kang, M. H., Kim, M. J., Kim, Hy. J., Um, S. Y., & Jung, H. Y. (2010). Investigating the relationship among students' collaboration preference, self-efficacy, interaction and achievement in the web-based collaborative learning. *Korean Journal of Educational Research*, *48*(1), 157-180.

Kim, E. J. (2018). Examining structural relationships among factors affecting learning engagement and outcomes in flipped-Learning college classrooms. *The Journal of Learner-Centered Curriculum and Instruction*, *18*(2), 451-469.

Kim, M. K., Kim, S. M., Khera, O., & Getman, J. (2014). The experience of three flipped classrooms in an urban university: an exploration of design principles. *The Internet and Higher Education*, *22*, 37-50.

Kim, N. I., Chun, B. A., & Choi, J. I. (2014). A case study of flipped learning at college: Focused on effects of motivation and self-efficacy. *Journal of Educational Technology*, *30*(3), 467-492.

Kim, Y. B. (2015). *Development of the design principles on flipped learning support system* (Doctoral dissertation). Pusan National University, Pusan. Korea.

Kirkman, B. L., & Shapiro, D. L. (2001). The impact of team members' cultural values on productivity, cooperation, and empowerment in self-managing work teams. *Journal of Cross-cultural Psychology*, *32*(5), 597-617.

Kirschner, F., Paas, F., & Kirschner, P. A. (2009). Individual and group-based learning from complex cognitive tasks: Effects on retention and transfer efficiency. *Computers in Human Behavior*, *25*(2), 306–314.

Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: Guilford press.

Kwon, K. K., & Chung, H. M. (2018). An analysis of relationship among academic self-efficacy, task value, learning engagement, academic achievement and learning satisfaction in the flipped learning environment. *Journal of Educational Technology*, *34*(3), 407-439.

Kwon, S. Y., & Choi, T. J. (2018). The analysis of the relationship between participation motivation, learning engagement, and learning outcome of adult learners participating in online degree course. *Journal of Fisheries And Sciences Education*, *30*(4), 1421-1438.

Lai, C. L., & Hwang, G. J. (2016). A self-regulated flipped classroom approach to improving students' learning performance in a mathematics course. *Computers & Education*, *100*, 126-140.

Lawanto, O., Santoso, H. B., Goodridge, W., & Lawanto, K. N. (2014). Task value, self-regulated learning, and performance in a web-intensive undergraduate engineering course: how are they related. J*ournal of Online Learning and Teaching*, *10*(1), 97-111.

Lee, E. K. (2011). Effects of students' flow and cognitive learning engagement on their learning outcomes in online learning. *The Journal of Educational Information and Media*, *17*(3), 379-397.

Lee, J. M., & Yoon, N. R. (2012). The effects of task value, twitter self-efficacy, and social presence on learning satisfaction on twitter discussion. *Journal of The Korean Association of information Education*, *16*(1), 51-59.

Lee, J. M., Noh, J. Y., & Chung, Y. H. (2016). Investigating factors affecting flipped learning outcomes. *Journal of The Korea Association of Information Education*, *20*(1), 57-68.

Lee, J. Y., Park, S. H., Kang, H. J., & Park, S. Y. (2014). An exploratory study on educational significance and environment of flipped learning. *Journal of Digital Convergence*, *12*(9), 313-323.

Lee, S. D. (2016). *Effects of scaffolding, metacognition and collaborative preference on problem-solving, collaboration load and knowledge sharing in blended collaborative learning* (Doctoral dissertation). Chen Nam University, Gwangju, Korea.

Lee, S. D. (2019). Educational effects of flipped learning on university teaching courses. *Journal of the Korea Academia-Industrial Cooperation Society*, *20*(2), 346-357.

Lee, Y. K., & Youn, S. K. (2017). Reconstructing the meaning of flipped learning by analyzing learners' experiences. *Journal of Engineering Education Research*, *20*(1), 53-62.

Leem, J. H. (2016). Teaching and learning strategies for flipped learning in higher education: A case study. *Journal of Educational Technology*, *32*(1), 165-199.

Lim, K. Y., Jin, M. H., Kim, S. W., & Jo, I. H. (2016). Relationships among self-determination, collaboration preference, cognitive presence and perceived achievement in flipped learning environment. *The Journal of Educational Information and Media*, *22*(3), 439-462.

Long, H. E., & Coldren, J. T. (2006). Interpersonal influences in large lecture-based classes: A sociolinstructional perspective. *College Teaching*, *54*(2), 237-243.

Marks, H. M. (2000). Student engagement in instructional activity: Patterns in the elementary, middle, and high school years. *American Educational Research Journal*, *37*(1), 153-184.

Mason, G., Shuman, T., & Cook, K. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *IEEE Transactions on Education*, *56*(4), 430-435.

McLaughlin, J. E., Griffin, L. M., Esserman, D. A., Davidson, C. A., Glatt, D. M., Roth, M. T., & Mumper, R. J. (2013). Pharmacy student engagement, performance, and perception in a flipped satellite classroom. *American journal of pharmaceutical education*, *77*(9), 196.

Neuville, S., Frenay, M., & Bourgeois, E. (2007). Task value, self-efficacy and goal orientations: Impact on self-regulated learning, choice and performance among university students. *Psychologica Belgica*, *47*(1), 95-117.

Newmann, F. M., Wehlage, G. G., & Lamborn, S. D. (1992). The significance and sources of student engagement. In F. M. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11-30). New York: Teachers College Press.

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education*, *25*, 85-95.

Packham, G., Jones, P., Miller, C., & Tomas, B. (2004). E-learning and retention: Key factors influencing student withdrawal. *Education + Training*, *46*, 335-344.

Park, E. S. (2018). A study on developing flipped-MOOC model in university. *Journal of Convergence for Information Technology*, *8*(6), 281-285.

Park, S. I., Lee, S. E., & Song, J. E. (2007). Major factors influencing effective on/offline learning on the blended learning in higher education. *The Journal of Yeolin Education*, *15*(1), 17-45.

Park, W. S., & Kim, H. W. (2016). A case study of flipped learning applied in the classroom: Focusing on academic and Nonacademic experiences, and classroom engagement of university students. *The Journal of Learner-Centered Curriculum and Instruction*, *16*(2), 525-546.

Pellas, N. (2014). The influence of computer self-efficacy, metacognitive self-regulation and self-esteem on student engagement in online learning programs: Evidence from the virtual world of Second Life. *Computers in Human Behavior*, *35*, 157-170.

Perry, N. E. (1998). Young children's self-regulated learning and the contexts that support it. *Journal of Educational Psychology*, *90*(4), 715-729.

Perry, N. E., VandeKamp, K. O., Mercer, L. K., & Nordby, C. J. (2002). Investigating teacher student interactions that foster self-regulated learning. *Educational Psychologist*, *37*(1), 5-15.

Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated

learning. *International Journal of Educational Research*, *31*(6), 459-470.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning component of classroom academic performance. *Journal of Educational Psychology*, *82*, 33-40.

Schaufeli, W. B., & Salanova, M. (2007). Efficacy or inefficacy, that's the question: Burnout and work engagement, and their relationships with efficacy beliefs. *Anxiety, Stress, and Coping*, *20*(2), 177-196.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), 23-74.

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist*, *32*(4), 195-208.

Seo, J. M. (2015). *A case study of general English education course based on flipped learning*. Proceedings of the Korean Association of General Education Conference, 6, 191-204.

Sletten, S. R. (2015). *Investigating self-regulated learning strategies in the flipped classroom*. Proceedings of Society for Information Technology & Teacher Education International Conference, 5(2), 497-501.

Sletten, S. R. (2017). Investigating flipped learning: Student self-regulated learning, perceptions, and achievement in an introductory biology course. *Journal of Science Education and Technology*, *26*(3), 347-358.

Steele, J. P., & Fullagar, C. J. (2009). Facilitators and outcomes of student engagement in a college setting. *The Journal of Psychology*, *143*(1), 5-27.

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research*, *15*(2), 171-193.

Sun, J. C. Y., & Rueda, R. (2012). Situational interest, computer self-efficacy and self-regulation: Their impact on student engagement in distance education. *British Journal of Educational Technology*, *43*(2), 191-204.

Tawfik, A. A., & Lilly, C. (2015). Using a flipped classroom approach to support problem-based learning. *Technology, Knowledge and Learning*, *20*(3), 299-315.

Tucker. B. (2012). The flipped classroom. *Education Next*, *12*(1), 82-83.

Wilson, S. (2014). The flipped class: A method to address the challenges of an undergraduate statistics course. *Teaching of Psychology*, *40*(3), 193-199.

Wu, D., & Hiltz, S. R. (2004). Predicting learning from asynchronous online discussion. *Journal of Asynchronous Learning Networks*, *8*(2), 139-152.

Yeung, K., & O'Malley, P. J. (2014). Making "the flip" work: Barriers to and implementation strategies for introducing flipped teaching method into traditional higher education courses. *New Directions for Institutional Research*, *10*(1), 59-63.

Yoon, J. E., Cho, H. M., & Kwon, O. N. (2016). Analyzing students' engagement factors in flipped mathematics class. *The Mathematical Education*, *55*(3), 299-316.

Yoon, S. J. (2007). *The effect of shared-leadership type and questioning scaffolding influencing college students' collaborative problem-solving in CSCL* (Doctoral dissertation). Korea University, Seoul, Korea.

You, J. W. (2011). *The structural relationship among social factor, psychological mediators and motivational factor for enhancing learners' engagement* (Doctoral dissertation). Ewha Woman's University, Seoul, Korea.

You, J. W., & Song, Y. H. (2013). Probing the interaction effects of task value and academic self-efficacy on learning engagement and persistence in an e-learning course. *The Journal of Learner-Centered Curriculum and Instruction*, *13*(3), 91-112.

Yu, J. P. (2012). *Structural equation modeling concept and understanding*. Seoul: Hannarae publishing.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: An Overview. *Educational Psychologist*, *25*(1), 3-17.

Korean Abstract

플립드 러닝에서 온라인 사전학습 과제가치와 협력지향성이 학습몰입에 미치는 영향: 자기조절학습능력의 매개효과

최설영 (중앙대, 석사), 송해덕 (중앙대, 교수)
김연경 (중앙대, 연구교수), Jung Won Hur (Associate Professor, Auburn Univ., USA)

본 연구는 대학교육 현장에서 최근 활발하게 적용되고 있는 플립드 러닝의성공적 도입을 위하여 사전학습과 교실학습 측면에서 온라인 과제가치, 협력지향성이 학습몰입에 영향을 주는지를 분석하고 자기조절학습능력의 매개효과를 확인하고자 수행되었다. 이를 위해 서울시에 소재한 C 대학에 개설한 플립드 러닝 수업에 수강하는 대학생 220명을 대상으로 설문지를 수집하였다. 연구결과, 첫째, 온라인 과제가치와 협력지향성은 각각 학습몰입에 유의한 영향을 미치는 것으로 분석되었다. 둘째, 온라인 과제가치와 협력지향성은 자기조절학습능력을 예측하는 것으로 나타났다. 셋째, 자기조절학습능력은 학습몰입에 영향을 미치는 것으로 검증되었다. 마지막으로 자기조절학습능력은 온라인과제가치와 학습몰입 간 관계, 협력지향성과 학습몰입 간의 관계를 부분매개하는 것으로 확인되었다. 이상의 연구결과를 토대로 플립드 러닝의 교수설계 관련 시사점 및 후속 연구를 위한 방향을 제시하였다.

주요어: 플립드 러닝, 온라인 과제가치, 협력지향성, 자기조절학습능력, 학습몰입