THE RELATIONSHIP AMONG SELF-REGULATED LEARNING, PROCRASTINATION, AND LEARNING BEHAVIORS IN BLENDED LEARNING ENVIRONMENT

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ABSTRACT

This research aims to investigate the relationship among the awareness of self-regulated learning (SRL), procrastination, and learning behaviors in blended learning environment. One hundred seventy nine freshmen participated in this research, conducted in the blended learning style class using learning management system. Data collection was conducted in two ways; questionnaires for SRL scale "Motivated Strategies for Learning Questionnaire" (Pintrich and DeGroot, 1990), and procrastination, and data log for learning behavior (report submission time). Students were asked to take the questionnaires in both pre and post class. As for learning behaviors, report submission time and one-minute paper submission time were collected using learning management system. The results revealed that internal value, self-regulation, and procrastination were fundamental elements that enhance the awareness of time management for learning plan, and positive time management awareness promoted to submit one-minute paper report within deadline, and regular report early.

KEYWORDS

Blended learning, Self-regulated learning, Procrastination

1. INTRODUCTION

Over 70 of the students in higher education postpone learning behaviors, until when they feel the necessary to do (Schouwenburg, Lay, Pychyl, & Ferrari, 2004). This learning behavior is known as Procrastination. Procrastination was traditionally regarded as unsuitable learning behavior, in order to perform high learning outcomes. However, planned procrastination seems to be positive learning behaviors for high learning performance. In the case that learner who postpones learning acts for high learning performance, procrastination seems to be positive action, which can be regarded as high-level self-regulated learner. This research aims to investigate the relationship among the awareness of self-regulated learning, procrastination, and learning behavior in blended learning environment.

2. PREVIOUS RESEARCH

2.1 Self-Regulated Learning

In order to foster autonomous learners, self-regulated learning is one of the important concepts for the design of learning environment. Many researchers conducted the research of self-regulated learning in experimental and practical educational settings. SRL is related to motivation, cognition, and self-control, as it is directed toward the accomplishment of learning purposes (Pintrich, 1999; Zimmerman, 1995). SRL learners are able

to apply self-control and self-evaluation (Deci et al., 1996). SRL is strongly concerned with metacognition, which leads to enhance the responsibility for learning on learner's learning goal(Schunk and Zimmerman, 1998; Zimmerman, 1986). Thus, the enhancement of the awareness of SRL can improve learning outcomes.

Schunk and Zimmerman (1998) developed a three-phase model for SRL: forethought, performance/volitional, and self-reflection (see Fig. 1). Schunk and Zimmerman (1998) further compared the learning behaviors of novice and expert SRL learners in each SRL phase (see Table 1). In the forethought phase, skillful learners were able to articulate their final goal, and the necessary steps for its accomplishment. The features of both the goal and the steps toward it were constructive and clear. Skillful learners also tended to have internal motivation and high self-efficacy. In the performance/volitional phase, skillful learners try to maximize the effects of learning by monitoring the learning process; in the self-reflection phase, they sought to evaluate their learning performance independently and tended to attribute its quality to learning strategies and practice. Wolters et al (2003) also suggest the SRL framework, which contains the similar concepts concerned with controlling myself with cognitively in learning context.

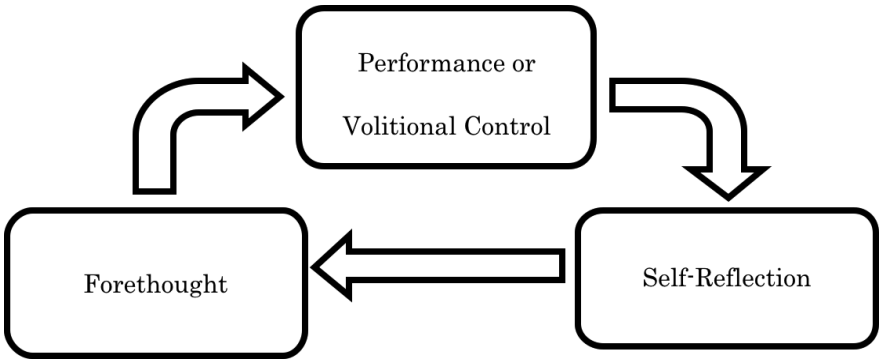

Figure 1. Three phase model of SRL (Schunk and Zimmerman, 1998)

In e-learning context, high performer has time-management skills. Goda et al (2009) investigated the relationship between learning performance and learning habit. The results of their research show that high performer tends to make a regular life with time-management skills. Goda et al (2009) pointed out the importance of time-management skills in e-learning environments and time-management is concerned with all SRL phases, which Schunk and Zimmerman (1998) also indicated the similar points in face-to-face learning environments.

Time management skill plays important roles in fruitful learning outcomes in both e-learning and face-to-face learning environments. Considering daily file, accomplishment of learning tasks following learning plan which learners made by them-selves indicates high SRL skill. In this sense, procrastination is not always harmful learning behavior for high learning performance.

Table 1. Differences between naïve and skillful self-regulated learners (Schunk and Zimmerman, 1998)

	Classes of self-regulated learners	
Self-regulatory phases	Naïve self-regulators	Skillful self-regulators
Forethought	Nonspecific, distal goals	Specific, hierarchical goals
	Performance goal orientation	Learning goal orientation
	Low self-efficacy	High self-efficacy
	Disinterested	Intrinsically interested
Performance/volitional control	Unfocused plan	Focused on performance
	Self-handicapping strategies	Self-instruction/imagery
	Outcome self-monitoring	Process self-monitoring
Self-reflection	Avoid self-evaluation	Seeking self-evaluation
	Ability attributions	Strategy/practice attributions
	Negative self-reactions	Positive self-reactions
	Nonadaptive	Adaptive

2.2 Procrastination

Skillful learners seem to use SRL skills appropriately, that is, SRL learners set appropriate learning goals including small steps, use the effective learning strategies such as monitoring strategy in performance phase, which leads to effective reflection for their learning. In this sense, procrastination can be one of effective learning strategies, in the case that learners can set appropriate learning time schedule, in order to accomplish the learning goals. Most research has found that procrastination has a negative effect on learning performance and can lead to physical and psychological problems (Hussain & Sultan, 2010). However, Chu and Choi (2005) suggested that some procrastinators performed high-quality learning outcomes with monitoring their learning behaviors, that is, procrastination is not always harmful for learning. Chu and Choi (2005) called them 'active procrastinator'. Active procrastinator has several features to accomplish learning goal effectively and efficiently. Chu and Choi (2005) indicated four features of active procrastinator; outcome satisfaction, preference of time pressure, intentional decision to procrastination, and ability to meet deadline. Strunk, Cho, Steele, and Bridges (2013) proposed a 2 x 2 model of procrastination with two dimensions of time-related academic behavior and motivational orientation.

Several research indicated that relationship between perceived sense of procrastination and procrastination behaviors. Most of the previous research indicated that negative correlation between procrastination behaviors and perceived sense of procrastination in traditional class(e.g., Tuckman, 1991; Howell et al, 2006). In e-learning, Goda et al (2014) reported that about 70 percent of learners were procrastinators, and the learning outcome (English test score) of procrastinator group was significantly lower than learning habit group. However, the relationship among SRL, procrastination, and learning behaviors is not clear.

2.3 Research Purpose

Reviewing sections 2.1 and 2.2, time management skill plays important roles in performing high quality learning outcomes, and procrastination under the learner's control can be effective on the SRL, however, the overall relationship among SRL, procrastination, and learning behaviors is not clear. This study aims to investigate their relationship in blended learning environment.

3. METHODS

3.1 Subjects and Course

One hundred eighty-three university students participated in this research. They all were the first-grade students, and took education introductory class. This course consists of fifteen classes. Main learning object is to understand the way to design the class with ICT. The students learned educational theories, principles, and history in the former eight classes. There were three criteria for grade; submission of one-minute paper after every class, regular reports (two times), and last report. Students should submit one-minute paper within a day for normal grade, but teacher accepted the submission one day delay (half a normal score was cut). One-minute paper must contain the class abstract and discussion. As for regular and last reports, teacher explained the report themes three weeks before the submission deadline. Students were required to submit one-minute paper and reports on LMS.

3.2 Data Collection

Students were asked to answer two questionnaires; Motivational Strategies for Learning Questionnaire(MSLQ) (Pintrich and DeGroot, 1990) and 2 x 2 time-related academic behavior scale (Strunk et al, 2013). The MSLQ, which consists of five factors (Self-Efficacy: SE, Internal Value: IV, Cognitive Strategies: CS, Self-Regulation: SR, Test Anxiety: TA; 44 items in sum, rated on a seven-point Likert scale; see Appendix A) was used for the subjective evaluation of learners' SRL skill, but the factor 'test anxiety'

(four items) was eliminated, because this class did not use test for assessment. 2 x 2 model of time-related academic behavior scale consists of 22 items; seven items for Procrastination-approach, four items for Procrastination-avoidance, six items for Timely engagement-approach, and five items for Timely engagement-avoidance. Students were asked to rate each item in seven-point Likert scale (see Appendix B). The students were asked to complete the MSLQ and 2 x 2 model of time-related academic behaviors scale at the first class. The second method of data collection was a log that record the submission time of three reports, in order to collect the data for learning behaviors. Submission time was converted for analysis; earlier students submitted assignment, submission time increases, for example, when student submitted one-minute paper one hour before the deadline, submission time is one, in another case, when student submitted the regular report 100 hours before deadline, submission time is 100. About one-minute paper, we counted the late submission time through fifteen classes.

4. RESULTS

One hundred seventy-nine first grade students answered two questionnaires in a class. We conducted the path analysis, in order to investigate the relationship between SRL, procrastination, and learning behaviors. In section 4.1, we showed the descriptive data, the results of path analysis were shown in the section 4.2.

4.1 Descriptive Data

Table.1 shows the average of each item. The score of each factor was calculated by the sum of each item in each factor. Average score of each factor and average time of submission are displayed in Tables 2, 3, and 4.

Table 2. Average sum score of each factor in MSLQ

Item	Average score	SD
Self efficacy (min: 9 – max: 63)	28.32	8.23
Internal value (min: 9 – max: 63)	45.28	8.08
Cognitive strategy use (min: 13 – max 91)	59.69	8.73
Self-regulation (min: 9 – max: 63)	36.97	4.61

Table 3. Average sum score of each factor in 2x2 model of time-related academic behavior scale

Items	Average score	SD
Procrastination - Approach (min: 7 - max: 49)	20.13	6.93
Procrastination - Avoidance (min: 4 - max: 28)	14.07	5.61
Timely engagement - Approach (min: 6 - max: 42)	24.72	6.31
Timely engagement - Avoidance (min: 5 - max: 35)	21.32	5.56

Table 4. Average submission time (hour) and the late submission time of one-minute paper

Items	Average	SD
The late submission time of one-minute paper	0.53	0.81
Submission time (hour) of regular report 1	21.31	32.18
Submission time (hour) of regular report 2	32.39	43.70
Submission time (hour) of last report	39.55	67.80

These results revealed that there were big differences between individual students in items Self-efficacy in MSLQ, Procrastination-Approach, and all learning behaviors, due to big standard deviation.

4.2 Path Analysis

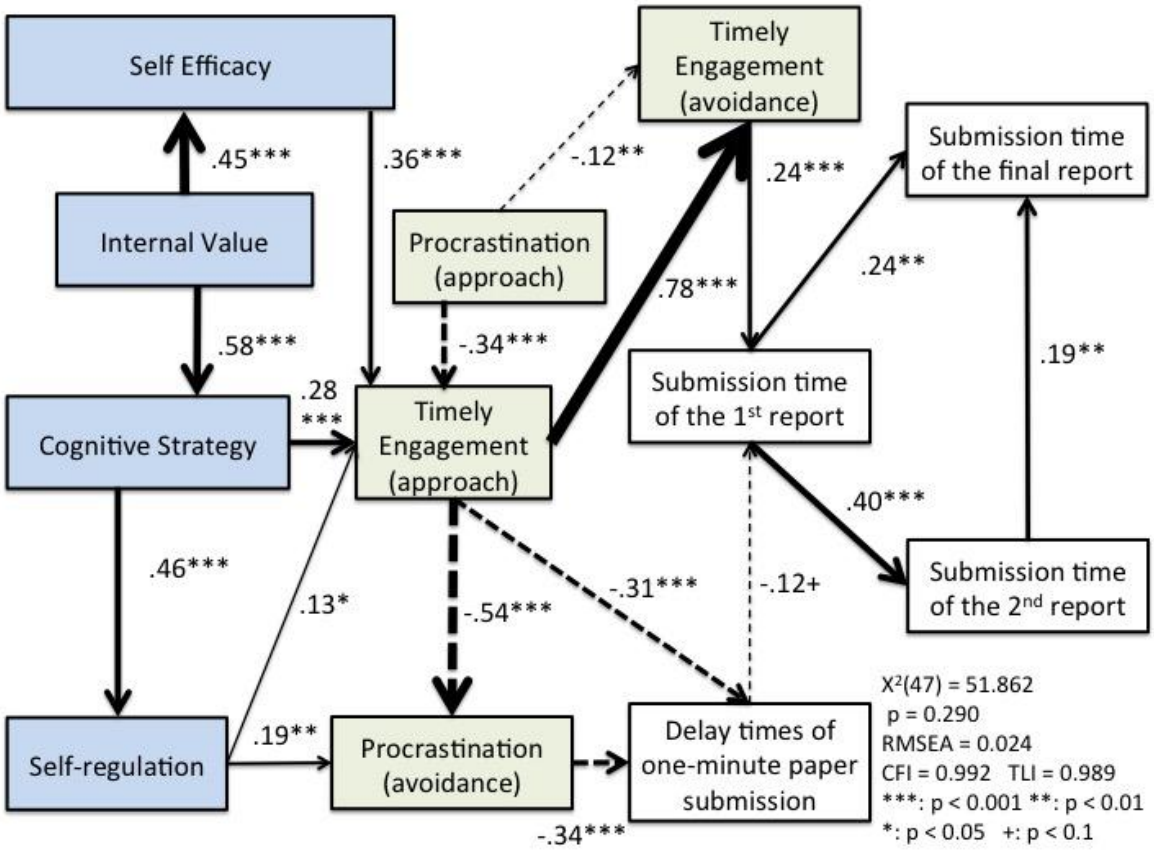

Figure 2. Results of path analysis (Dotted line means negative relationship)

Path analysis was employed using the average sum score and average submission time of three reports, and average late submission time of one-minute paper, in order to investigate the relationship among them. Figure.1 shows the relationship among them using path analysis. Considering the statistic criteria of model fitness, this model is acceptable (chi2 = 51.862, df = 47, p = 0.290, RMSEA = 0.024, CFI = 0.992, TLI = 0.989)

The results indicated that internal value in MSLQ, and Procrastination – approach in 2 x 2 model were fundamental factors in order to raise the awareness of other MSLQ and time-related learning behaviors. In this overall model, negative and positive flow can be confirmed. In positive relationship, procrastination – avoidance affects on the late submission of one-minute paper negatively, and the late submission of one-minute paper also has negative relationship with the submission time of the first report. The submission time of the first report affects on both the submission times of the second and final report positively. In this relationship, learners who have high SRL awareness and active procrastination, keep the time for learning outcome submission. On the other hand, there seemed the learners who took negative time-related learning behaviors. Though learners had high SRL awareness, several learners have negative awareness of time-related learning behavior. Less procrastination - approach learners also have negative awareness of time-related learning behavior. However, the difference between positive and negative relationships is whether the late submission time of one-minute paper is mediated in the relationship. The learners who have high SRL awareness and time-related learning behavior seem to be aware of the engagement of weekly-task in every class.

5. CONCLUSION AND FUTURE WORKS

This study aims to investigate the relationship between the awareness of SRL, procrastination, and learning behavior, in particular, the submission time of learning outcome, which is one of time-related learning behavior. The results revealed that SRL and procrastination positively affects on the learning behavior. Both positive and negative viewpoints of procrastination play important roles in the learning behavior; both the awareness of time-related learning behavior kept the deadline of the submission. Time management is one of important skills in SRL (e.g., Wolters et al, 2003; Barnard et al, 2009). The results of this study also indicated the awareness of that high SRL has positive relationship with the awareness of time engagement – approach, which is one of active procrastination elements. This results supports the findings of the previous research. However, not only active procrastination, but also passive procrastination keep the submission deadline, that is, even if learners regard time-related learning behavior as negative action, learners can do suitable learning behaviors. Wäschle, Allgaier, Lanchner, Fink, and Nuckles (2014) show feedback loop between low self-efficacy and perception of goal achievement in procrastination in the investigation of the relationship between SRL and procrastination. But, in case that learners have high SRL awareness, learners can do appropriate learning behavior, even if learners have negative awareness of time-related learning behavior. Self-efficacy seems to play an important role in bridging learning behaviors and learning performance (Yamada et al, 2015).

Future research should to clarify the relationship between SRL and learning performance. Schunk and Zimmerman (1998) indicated the differences between skillful and naïve self-regulated learners. There seems to be differences between high and low learning performers in the relationship among SRL, procrastination, and learning behaviors. Attitude of ICT use in education should be considered in the future re-search. Usta (2011) indicated that negative attitude of ICT use has positive relation-ship with goal setting, time management, help-seeking, self-regulation, in particular, help-seeking behavior in e-learning setting can affect on learning performance (Goda et al, 2013). In this study, ICT was used in blended learning settings. Therefore, the effects of ICT use may affects on the results of this study.

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Appendix A Motivational Strategies for Learning Questionnaire (Pintrich and DeGroot, 1990)

Factor	Item
Self-Efficacy	Compared with other students in this class, I expect to do well.
	I'm certain I can understand the ideas taught in this course.
	I expect to do very well in this class.
	Compared with others in this class, I think I'm a good student.
	I am sure I can do an excellent job on the problems and tasks assigned for this class.
	I think I will receive a good grade in this class.
	My study skills are excellent compared with those of other students in this class.
	Compared with other students in this class, I think I know a great deal about the subject.
	I know that I will be able to learn the material for this class.
Intrinsic Value	I prefer class work that is challenging so I can learn new things.
	It is important for me to learn what is being taught in this class.
	I like what I am learning in this class.
	I think I will be able to use what I learn in this class in other classes.
	I often choose paper topics I will learn something from even if they require more work.
	Even when I do poorly on a test, I try to learn from my mistakes.
	I think that what I am learning in this class is useful for me to know.
	I think that what we are learning in this class is interesting.
	Understanding this subject is important to me.
Test Anxiety	I am so nervous during a test that I cannot remember facts I have learned.
	I have an uneasy, upset feeling when I take a test.
	I worry a great deal about tests.
	When I take a test, I think about how poorly I am doing.
Cognitive Strategy Use	When I study for a test, I try to put together the information from class and from the book.
	When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly.
	It is hard for me to decide what the main ideas are in what I read. (R)
	When I study, I put important ideas into my own words.
	I always try to understand what the teacher is saying even if it doesn't make sense.
	When I study for a test, I try to remember as many facts as I can.
	When studying, I copy my notes to help me remember material.

	When I study for a test, I practice saying the important facts over and over to myself.
	I use what I have learned from old homework assignments and the textbook to do new assignments.
	When I am studying a topic, I try to make everything fit together.
	When I read material for this class, I say the words over and over to myself to help me remember.
	I outline the chapters in my book to help me study.
	When reading, I try to connect the things I am reading about with what I already know.
Self-Regulation	I ask myself questions to make sure I know the material I have been studying.
	When work is hard, I either give up or study only the easy parts. (R)
	I work on practice exercises and answer end of chapter questions even when I don't have to.
	Even when the study materials are dull and uninteresting, I keep working until I finish.
	Before I begin studying, I think about the things I will need to do to learn.
	I often find that I have been reading for class but don't know what it is all about. (R)
	I find that when the teacher is talking, I think of other things and don't really listen to what is being said. (R)
	When I'm reading, I stop once in a while and go over what I have read.
	I work hard to get a good grade even when I don't like a class.

Appendix B: 2 x 2 measure of time-related academic behavior scale (Strunk et al, 2013)

Factor	Item
Procrastination - Approach	I more effectively utilize my time by postponing tasks
	I delay completing tasks to increase the quality of my work
	I put off starting tasks to increase my motivation
	I feel a stronger state of flow in my tasks when working closer to a deadline
	I intentionally wait until closer to the deadline to begin work to enhance my performance
	I delay tasks because I perform better when under more time pressure
	I rarely have difficulty completing quality work when starting a task close to the deadline
Procrastination - Avoidance	I put off tasks for later because they are too difficult to complete
	I avoid starting and completing tasks
	I often delay starting tasks because I am afraid of failure
	I delay starting tasks because they are overwhelming
Timely engagement - Approach	I work further ahead of the deadline at a shower pace, because it helps me perform better
	I believe I can successfully complete most tasks because I start work immediately after being assigned a task
	I do my best work well ahead of the deadline
	I start working right away on a new task so that I can perform better on the task
	I complete my tasks prior to their deadline to help me be successful
	I begin working on difficult tasks early to achieve positive results
Time engagement - Avoidance	I start my work early because my performance suffers when I have to rush through a task
	I do not start things at the last minute because I find it difficult to complete them on time
	I begin working on a newly assigned task right away to avoid failing behind
	When I receive a new assignment, I try to complete it ahead of the deadline to avoid feeling overwhelmed
	On extremely difficult tasks, I begin work even earlier so I can avoid the consequences of putting it off for later