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Mobile Moodle to Support Graduate Students Self-Regulated Learning: An Ex-Post Facto Study

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Abstract

The use of a mobile learning management system (LMS) has engendered pros and cons concerning the effects on influencing the students' self-regulated learning (SRL). A large number of research studies concerning mobile-LMS have been done in the past decades. Studies have also demonstrated that the use of mobile LMS can facilitate the users as it can be conveniently accessed anywhere with their mobile phones. However, those studies have not comprehensively discussed the results of the students' mobile-LMS on their self-regulated learning development. Hence, this research aims to investigate the use of mobile learning management systems, specifically mobile Moodle, to support the students' self-regulated learning. An ex-post-facto research study was used to gather the respondents' data after they experienced the mobile Moodle and the relationship to the SRL development. The respondents were 15 students from English Education Master Program, Yogyakarta, Indonesia. Further, the questionnaires and interviews were used to gather and analyze the data. The results showed that most of the graduate students were facilitated by the use of mobile Moodle to develop their self-regulated learning. The result showed that the features, namely, upcoming events, messages, and chats, positively related to the students' SRL construction. However, the participants highlighted the easiness of using reminder and notification features since some of the students cannot receive the notification directly to their phones. Thus, the mobile Moodle developer should improve it to maximize its benefit in influencing students' SRL.

Keywords: Graduate students' self-regulated learning; learning management system; mobile Moodle

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INTRODUCTION

Technology has become one of the powerful tools for human life, particularly for educational development (Pelgrum & Law, 2017). In the view past years, technology development in education brings about the rise of a learning management system (LMS) that has been growing rapidly in this era (Han & Shin, 2016). This development presents the facility of conducting a class activity through the LMS beyond the boundary of time and place. Recently, most of the LMS has built its mobile version to accommodate the feature of accessing the LMS through the students' mobile phones which also offer multilingual supports (Muhammad and Cavus, 2017). The development of mobile LMS can be a potential tool to support the learning process. Further, the Moodle LMS develops their mobile-Moodle that can be utilized to support the learning process so that universities, schools, businesses, and even individual instructors can use it as a blended learning supplementary (Yeou, 2016). The development of mobile Moodle brings about a flexible learning process since it can be accessed anytime.

However, Han and Shin (2016) found that the mobile Moodle is less used than the Moodle accessed on the website. The Moodle forum discussion initiated by Lande (2016) which focuses on both mobile Moodle and Website Moodle found that the display of Website Moodle is considered more interesting. Nevertheless, the use of both mobile Moodle and website Moodle in the learning process has a factor that can influence the result of the learning process. Based on the discussion, the website mobile allows both teacher and students to modify their pages based on their preferences, for example, by changing the menu display or adding and deleting the menu on the page. However, the mobile Moodle app has a more rigid display that cannot be modified unless the organization/school pays for the subscription.

On the other hand, Ndlovu and Mostert, (2018) and Peramunugamage, Usoof, and Hapuarachi (2019) found that the mobile LMS offers a number of benefits. The mobile LMS allows the students (1) to access the learning contents and share them with others whenever and wherever they are (Peramunugamage, Usoof & Hapuarachi, 2019); (2) to improve the cognitive process

of exploration and sharing of ideas (Ndlovu and Mostert, 2018).

Beyond this usefulness, mobile Moodle is also beneficial for the students to support them to achieve self-regulated learning (SRL) in their learning process. O'Bannon and Thomas (2015) believe that mobile-Moodle extends the potential to help the students to self-regulate their learning style due to its accessibility, flexibility, ease of assessment and feedback, and the possibility to share and give comments to both students to students and teachers to students. Zhu, Au, and Yates (2016) add that the use of the learning management system in blended learning significantly impacts the students' learning outcomes. Therefore, the positive impact of Moodle in blended learning could positively influence the students' SRL.

However, there are still doubts concerning the effectiveness of mobile LMS in influencing the students' SRL. Raelovich, Mikhlievich, Norbutaevich, Mamasolievich, Karimberdievich, and Suyunbaevich (2020) state that the use of mobile learning in the learning process should be followed by clear rules and regulations to avoid the negative effect. Crompton and Burke (2018) add that the utilization of mobile learning could lead to both negative and positive impacts depends on the pedagogic variable used by the educator and the students' individual. Thus, the effect of using mobile Moodle in the learning process is depending on how the educators directed the goals of learning using mobile Moodle.

In addition, there are a lot of studies concerning mobile LMS such as O'Bannon and Thomas (2015), Han and Shin (2016), Ndlovu and Mostert (2018), Crompton and Burke (2018), and Raelovich et al. (2020). However, none of them specifically concern the use of mobile LMS (Moodle) that can be a potential tool in influencing the students' SRL. Therefore, the research aimed to investigate the students' perception of using mobile Moodle in the learning process and the relationship to the students' self-regulated learning in the English graduate program at Sanata Dharma University.

Since the research aims are to investigate the mobile Moodle relationship in influencing students' SRL, an ex post facto was utilized to understand the participants' perceptions after the experience of using mobile Moodle and the relationship to the SRL development. An ex-post facto was used to gain natural data based on the real situation that happened without any manipulation (Ary, Jacob, Sorensen, & Razavieh, 2010). Further, this research generated two research questions as the main consideration in this research. The first question was does the use of mobile Moodle in the learning process gives positive or negative influences on the students' SRL. The second question was how the mobile Moodle influences the students' SRL. Further, to support the research questions formulated in this study, the researchers formulated two research hypotheses namely, (1) The use of mobile Moodle gives positive influences on the students' SRL, and (2) The ease of accessibility and flexibility influence the students' SRL. Moreover, a detailed discussion of the methodology and how it is applied is presented in the following discussion.

METHOD

The method used in this research was an ex-post facto study (non-experimental), using purposive sampling for 15 participants. The participants were English Education graduate students who were familiar with the use of the mobile-Moodle platform in the class. Those 15 participants were chosen using purposive sampling based on the criteria that they have the experience of using both MM and the website Moodle in the learning process. The main variables of this research were the students' perception of using mobile LMS (independent variable) and its relationship with the students' SRL development (dependent variable). The ex-post facto research was used in this study because of two reasons. The first was to gain a deeper understanding of the direct or inverse relationship between mobile-Moodle usage to the students' SRL development without any manipulation (Ary et al., 2010). Second, the relationship of those variables should be investigated in depth because there were still pros and cons towards the benefit of using mobile-Moodle to the students' SRL development. Therefore, this study aimed to know the participants' opinions of their experience after using the mobile-Moodle platform in their learning process and the relation to the students' SRL development.

This research used some instruments to collect data from the participants. The instruments consist of a questionnaire and interview. Moreover, the questionnaire was used to gain the students' perception after experiencing using mobile Moodle in their learning process. The questionnaire used was closed-ended questions. Further, the measurement of a closed-ended questionnaire would be in the form of a Likert scale developed by Joshi, Klae, Chandel, and Pal (2015). The questionnaire was employed to know the students' perception of Moodle to support the students' SRL. The questionnaire adapted some questions from the SOL-Q by Jansen et al. (2018) combined with the three phases of students' SRL generated by (Zimmerman & Schunk, 2011). The three phases, which were preparatory, performance, and appraisal phase, were specified into 6 main concerns namely, metacognitive skills, environmental structuring, time management, persistence, help-seeking, and self-evaluation (Jansen et al., 2018). The researchers adapted those aspects in the SOL-Q and three phases of students' SRL as the basis of the questionnaire and interview questions. The questionnaire results were used to answer the first research question, namely the use of mobile Moodle to support the students' SRL.

As for the interview questions, the researchers used the respondents' questionnaire responses as the basis to develop the interview questions. There were three respondents to be the interviewee. Further, this research used a semi-structured interview. The semi-

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structured interview in an open situation allowed the researchers to explore what was the respondent felt (Cohen et al., 2012). Nevertheless, there would be a limitation regarding the questions. The limitation was based on the three phases of students' SRL, namely forethought, performance, and reflection (Zimmerman & Schunk, 2011). However, the researchers had the flexibility in the process of the interview. Various answers were indicated from the results of the interview. The more various the answer, the more it gave benefits to the research to have a deeper analysis. Further, the researchers analyzed the result of the interview by categorizing the answer from the students from the interview transcripts.

To answer the second research question, namely how the Moodle App promotes SRL in the learning process, the researchers decided to use an open-ended questionnaire. The open-ended questionnaire gives benefit to the research to gain various and detailed information about the participants' perception and facilitates more comprehensive data analysis (Cohen et al., 2012). The open-ended questions comprise six questions that focus on how the mobile Moodle promotes SRL. The detailed questions were presented in the research results and discussion section as follows.

RESULTS AND DISCUSSION

As it is an ex-post facto, the researchers did not intend to investigate the dynamic process of designing the contents of the MM. Rather, the study was limited to answer the two research questions, namely whether the students' SRL in the learning process is influenced by the utilization of mobile Moodle and how the mobile Moodle influence the students' SRL. The discussion of the findings is organized within two sub-sections focusing on each of the research questions. Further, the answer to the first research question is presented as follows.

Mobile Moodle in Influencing SRL

The first question would be answered based on the data gathered in a questionnaire form. The questionnaire consisted of four main considerations adapted from SOL-Q. Those four main considerations were metacognitive skills, time management, help-seeking, and self-evaluation (Zimmerman & Schunk, 2011; Jansen et al., 2018)

The first section of the questionnaire focused on the students' metacognitive skills and the relationship of MM utilization in the learning process. The questions of this section were adapted from SOL-Q which focused on the students' metacognitive skills in learning. The results of the students' responses were gathered in the form of a table presented as follows.

Table 1
Metacognitive Skills in MM

Questions	Students' Response				
	SD	D	N	A	SA
Fulfill students' needs	0%	6.7%	6.7%	40%	46.7%
Strategy shifting friendly	0%	6.7%	13.3%	53.3%	26.7%
Material preview helps to set strategy.	0%	0%	6.7%	53.3%	40%
Help to set goals before, during, and after learning.	0%	6.7%	20%	40%	33.3%
Total average	**0%**	**5.1%**	**11.7%**	**46.6%**	**36.6%**

Based on the data presented in Table 1, most of the students felt that MM helped to build their metacognitive skills in learning. Around 83% of the students agreed with the statements that the use of MM built positive relation to the development of metacognitive that could lead to SRL. However, the other students chose to be neutral and disagreed with the statement (16%). Although the percentage is not significantly high, it also imparts that some students did not yet feel that MM had a positive influence on their SRL. Hence, this can be further investigated to improve the implementation of MM.

The result of the first questionnaire section showed that the use of MM has a positive relation to the SRL improvement. Khiat (2019) also demonstrates the same point in the study that the LMS features that can help to fulfill the students' needs would positively affect the students' SRL development. Besides, the positive results proved that the MM has a significant effect to help the students in shaping their metacognitive in the learning process. Similarly, Oppong, Shore, and Muis (2018) also state in the study that the improvement of metacognitive skills could give better SRL.

The other important point was most of the students stated that they shifted the unsuccessful learning strategy by evaluating it and looking for the suitable one every time they have done the learning process in MM. It means that the students were helped by adapting some successful strategies used in the MM. Muis, Chevrier, and Singh (2018) mention in the study that the evaluation phase, which is also included in metacognition, helps the students to regulate their strategies and style in the study.

The next table was focused on MM in helping the students to manage their study time well. It is said by Wolters, Won, and Hussein (2017) and Wolters and Brady (2020) that time management is an important self-regulatory process concerning when and how long the students spend their time studying to reach their academic goals. The detail is presented in Table 2.

Table 2
Time Management in MM

Questions	Students' Response				
	SD	D	N	A	SA
Tasks' due date reminder	0%	6.7%	6.7%	53.3%	33.3%
Semester schedule	0%	0%	0%	53.3%	46.7%
Help to be well time management	0%	13.3%	6.7%	53.3%	26.7%
Help to set the time for studying	0%	20%	46.7%	20%	13.3%
Total average	**0%**	**10%**	**15%**	**45%**	**30%**

The result shows that 75% of the students were helped by the features in MM, especially the feature of "upcoming events". However, the result also gave the information that 10% of the students stated that MM should be improved in facilitating their time management in learning. The main problem discussed in this section was the interface of the features that makes some of the students confuse. Khiat (2019) also mentioned in the study that a friendly user interface would positively affect the students' self-regulated learning development. Similarly, Laux, Luse, and Mennecke (2016) argued in their study that the core of human-computer interaction should be in the usability that contains the ease interface and efficiency. Therefore, the MM should develop a more interesting and easy user interface to maximize the benefit.

Further, the environmental structuring was also one aspect that is considered important to influence the students' SRL. Therefore, Table 3 would focus on the result discussion on how the environment influences the students' SRL.

Table 3
Environmental Structuring in MM

Questions	Students' Response				
	SD	D	N	A	SA
Accessible anywhere and anytime	0%	6.7%	20%	60%	13.3%
The place affected the study efficiency	0%	0%	6.7%	60%	30.3%
Need a special place to study	0%	0%	6.7%	46.7%	46.6%
Comfortable place affects my study efficiency	0%	0%	13.3%	53.3%	33.4%
Physical and mental condition affects my study	0%	0%	6.7%	66.7%	26.6%
Total average	**0%**	**1.3%**	**10.7%**	**57.3%**	**30.7%**

Based on Table 3 results, most of the students, which were 88%, were agree that the use of MM in the context of environmental structuring influence the students' SRL. The environmental structuring was considered to affect the way the students learned using MM. Since this research focuses on the SRL and its relation to the use of MM in the learning process, the environmental structuring showed that achieving students' SRL is also affected by the inside motivation of the students themselves. It is essential to note, however, that the accessibility and flexibility of MM to be used in any condition have clearly demonstrated that it is a good supporting tool to achieve students' SRL. Likewise, Zarouk and Khaldi (2016) mentioned in the study that the accessibility and flexibility that an LMS has would positively influence the students' SRL. In the case of MM and based on the results, the use of MM in the learning process has become a supporting tool to construct SRL through environmental structuring. However, the factor that could influence the students' SRL was not only coming from the environment but also the inside motivation of the students. Therefore, the next table focused on investigating the students' persistency in the learning process using MM.

Table 4
Persistence in MM

Questions	Students' Response				
	SD	D	N	A	SA
Force to study	6.7%	6.7%	13.3%	60%	13.3%
The effort to keep concentrating	0%	20%	6.7%	60%	13.3%
Push to study when lost interest	0%	33.3%	20%	46.7%	0%
Do the best in every task	0%	13.3%	20%	53.3%	13.3%
Stick to the plan	0%	0%	13.3%	66.7%	20%
Total average	**1.3%**	**14.7%**	**14.7%**	**57.3%**	**12%**

Based on the data presented in Table 5, the result showed that 69.3% of the students were persistent in doing tasks in MM. However, the neutral percentage was the same as the disagree, which was 14.7%. Further, there were 1.3% of students who disagree to force to study when they felt bored. It indicates that

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there might be some problems that occurred during the learning process using MM. The problems that occurred in the learning process using MM should be fixed to meet the students' satisfaction (Muhammad & Cavus, 2017). However, the problem was still bias, whether it came from the MM or the individual students. Therefore, further investigation of problems that occur in the learning process would be presented in the interview section. Nevertheless, in facing the problems the students might be seeking help from other classmates or lecturers. Thus, the next table focused on the discussion about how the students seeking help in MM.

Table 5
Help-Seeking in MM

Questions	Students' Response				
	SD	D	N	A	SA
Ask other classmates	0%	6.7%	6.7%	73.3%	13.3%
Discuss and share problems	0%	6.7%	6.7%	53.3%	33.3%
Student-lecturer communication	0%	6.7%	26.7%	66.7%	0%
Student-student communication	0%	0%	6.7%	86.7%	6.7%
Total average	**0%**	**5%**	**11.7%**	**70%**	**13.3%**

In Table 5, the data presented showed that most of the students were helped by the features in MM to seek help. The students have mostly used the communication features, namely message, and chat, to look for help from their classmates and lecturers. Jansen et al. (2018) state in the study that help-seeking is an environmental structure that helps the students to build their regulation on one of the ways to solve problems. It positively showed that MM, which has sharing and discussion features, was considered helpful for the students to fulfill their needs. Zheng (2016) found the study that fostering SRL should be based on the students' needs. Therefore, the features of LMS that match with the students' needs significantly help them to develop their SRL.

Further, the last step of SRL was the ability to reflect and evaluate the learning performance they had. Thus, in Table 6 the discussion focused on the students' self-evaluation using MM.

Table 6
Self-Evaluation in MM

Questions	Students' Response				
	SD	D	N	A	SA
Reflect on the strategies	0%	6.7%	0%	60%	33.3%
Evaluate the strategies	0%	0%	0%	80%	20%
Analyze the strategies	0%	13.3%	33.3%	33.3%	20%
Look for other strategies	0%	0%	33.3%	46.7%	20%
Total average	**0%**	**5%**	**16.7%**	**55.6%**	**22.7%**

Based on Table 6 results, most of the students stated that they reflect, analyze, evaluate, and look for suitable learning strategies every time they have done the learning process in MM. It means that the students were helped by adapting some successful strategies used in the MM. Muis Chevrier, and Singh (2018) mention in the study that the evaluation phase, which was also included in metacognition, helped the students to regulate their strategies and style in the study. Therefore, the use of MM in the learning process has a positive relationship to the students' SRL development.

Based on the data presented in the questionnaire section, most of the students agreed with the use of MM to promote SRL in the learning process. It was shown by the total average of 'Agree' and 'Strongly Agree' perceptions of 80.4%. This average showed that the use of Moodle in the learning process helps the students to promote SRL in the learning process. There were still 12.7% of the respondents who answer Neutral and 6.9% answer Disagree and Strongly Disagree. Thus, it can be concluded that the use of MM in the learning process has a positive relationship to the development of students' SRL. However, the researchers found that the interface of the features should be improved to make it simple and easy to be used. Based on these findings, the researchers decided to interview three students to gain a deeper understanding of MA in promoting SRL. Those three students were chosen based on the answer in the questionnaire section.

As for gaining more information, the researchers added the semi-structured interview in the second section to measure the students' SRL using what so-called "self-regulated learning interview schedule" (SRLIS) (Zimmerman & Pons, 1986; Erdogan & Senemoglu, 2016). The SRLIS was applied to make flexible interviews based on the situation faced. The questions concern the students' metacognition skills using MM.

Table 7
Students' Metacognitive

Participant	Excerpts
Student A	"Knowing the topic and schedule helps me to plan my study time."
Student B	"Easy to summarize what I have learned through the class discussion and notes that have been saved"
Student C	"Through sharing and discussion, it can enrich my knowledge by modifying exist knowledge to new knowledge."

The responses above were about the features in MM that help the students' metacognition to set the learning goal. Those features were the schedule that is provided in upcoming events and the chat and discussion feature that help the experience sharing and discussion.

Based on the result of the interview section most of the interviewees responded that they had set the learning goal. However, the goals that the interviewees have were quite mixed. The first interviewee expected to make a study plan based on the topic and the schedule provided in the MM. Khiat (2019) mentioned in the study that the LMS that provides a timetable increases the SRL, especially in planning and managing their study. Meanwhile, the second interviewee expected to be able to learn deeper by summarizing the materials, discussions, and notes of what they have learned in the class. Zheng (2016) and Khiat (2019) also found in the study that the features in LMS that help students fulfilled their needs positively increase the students' SRL. Whereas, the other interviewee expected to get new experiences by sharing and discussing new information.

Based on the excerpts of the interview, the researchers conclude that most of the students were helped by the features provided in the MM to apply their metacognition in learning. The features of MM help them to set up the goals based on their prior knowledge. Thus, it can be concluded that the features in MM helped the students to be metacognitively aware of their learning goals. Further, the ability to set up the goals indicates that the MM helped the students to promote SRL. However, the second question was focus on the students' learning strategies used in MM.

Table 8
Learning Strategies Used in MM

Participant	Excerpts
Student A	"shifting strategy helps to study in MM."
Student B	"ask my peers' strategy and modify to adapt my strategy."
Student C	"making a reflection and doing some evaluation after studying or doing some tasks."

From the data gathered, all of the students were applying certain strategies in finishing the tasks. Further, the students were able to adapt to new strategies regarding the difficulties they faced in the learning process. Yamada, Shimada, Okubo, Oi, Kojima, and Ogata (2017) also stated in the study that a supportive environment of LMS could increase the SRL skill acquisition.

The fact that the students were able to change and modify the strategies demonstrated that the students successfully regulated their learning process in MM. Further, the students' strategies were slightly different from each other. Some of the students reflected on their experience and evaluated the strategies they used in some cases. While the other students were asking their peers and construct new strategies based on their preference. In conclusion, the strategies used by the students were various. However, all of the students confirmed that they have regulated their strategies according to the problem faced. Further, related to the students' learning strategies, time management becoming one of the important factors that influence successful strategies in learning. Thus, in Table six the researchers focused on the students' time management used in MM.

Table 9
Students' Time Management in MM

Participant	Excerpts
Student A	"the due date reminder helps me to accomplish my tasks."
Student B	"the material schedule helps me to monitor which one needs to be done first."
Student C	"the mobile Moodle helps me to set my plan and even do the task through my mobile phone."

Based on the results above, most of the students were able to manage their study time well. The result showed that the students were helped with the notification features given in the Moodle mobile application. The notification feature could be used as a reminder of any tasks and materials that the students have not done yet. Therefore, it helps the students to do the tasks and study the materials based on the

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learning plan that has been set at the beginning of the semester. Moreover, some of the students were working and studying at the same time and the Moodle mobile platform helps them to do the tasks without any boundaries. It means that the students could accomplish the task whenever and wherever they were. The students' awareness of completing the tasks on time indicated that the students were able to regulate their time. The mobile application has also influenced the students to accomplish the tasks on time.

As the students' awareness in the learning process becomes an important factor in SRL, the students' persistency and the factors that influenced their persistence in learning would be discussed as follows.

Table 10
Students' Persistence in MM

Participant	Excerpts
Student A	"I keep my pace to manage my progress in accomplishing the tasks."
Student B	"recalling the plan that I set whenever I feel bored."
Student C	"forcing myself to accomplish it although I feel bored."

The students' persistence in the process of learning and doing the tasks became the main problem to do the tasks effectively. The result shows that some of the students were still forcing themselves to finish the task on time. Based on the interview result, students were likely to stop their work and look for more interesting, such as watching films, playing games, chatting, etc. Han and Shin (2016) also mention in their study that online learning could lead to distraction since the students are often surfing other things outside the learning topic when they felt bored. However, the students stated that they would like to force themselves to finish the tasks. It was because the students will get extra points if they could accomplish the tasks before the due time. Ndlovu and Mostert (2018) and Khiat (2019) stated that giving a reward to the student's effort in completing the tasks would motivate them in learning. Further, it could lead the students to self-regulate themselves to learn and do the tasks given to get more points as a reward.

Based on the result of the questionnaire and followed by the interview in the second section, most of the students were helped by the use of MM in the learning process. The MM helped the students through some features, which were schedule/upcoming events and the messages/chat, that proven to influence the SRL. The easiness to access the last meeting materials also helped the students to evaluate and re-check their understanding of that materials.

As to gain more information on how the MM influences the students' SRL the researchers used an open-ended questionnaire. The result of the open-ended questionnaire would be discussed as follow.

How Mobile Moodle Influences SRL

To answer the second research question, the researchers utilized an open-ended questionnaire. Six open-ended questions were focused to investigate on how the mobile-Moodle influences students' SRL. Those questions were formulated based on the findings in the first phase of the questionnaire, which was the features issues in MM. In the first phase, only a few percentages of participants were familiar with the timeline feature that helps them to know some important issues including the meeting schedule and the due date of the task. The Moodle mobile version allows the students to set a reminder for the task due date, class meeting, and any important dates.

The first question concerns the respondent's preference of using Moodle in the website mode or mobile mode version. The researchers classified the respondents' answers that nearly have the same idea. Based on the answer, all of the respondents have already experienced the website and mobile versions. However, based on their experienced, ten out of fifteen respondents preferred to use the website mode because when they access the website mode, they found that the bigger screen is more pleasant to their eyes and the display ratio in the website mode is surely better than the mobile one. Nevertheless, the other five respondents answer that they prefer to use the mobile version because they can access it everywhere. They reported that sometimes the website Moodle mode cannot be accessed because too many students access the same site at the same time. The result shows that most of the respondents prefer using website mode because the display is more interesting and makes them comfortable. However, sometimes the respondents experienced lag and crash when they accessed the website Moodle in the busy traffic of class activity. Therefore, the other respondents chose the mobile one because it rarely lagged or crashed.

The second open-ended question focused on the mobile Moodle's potential to help the students to manage their time to study. Most of the participants stated that the features in Moodle allow them to know the next important dates by looking at the timeline provided. Further, the participants mentioned that the upcoming events features help them to manage their work so that they can finish it on time. However, some of the students mentioned that the notification cannot directly notify them through their mobile phones. The students have confirmed that they had turned on the mobile notification in the MM application and phone settings. This problem should be further investigated to maximize the benefit of MM.

On the other hand, the timeline and upcoming events feature would be beneficial to be the influence

to the students' SRL. Khiat (2019) mentions in his study that schedule features in LMS could help the students to manage their time to accomplish their tasks on time. Wolters and Brady (2020) also mention that well-time management could lead to better self-regulatory of a student.

Further, the third question was the upcoming events feature in mobile Moodle that could be a tool to help the students to manage their study time. Based on the participants' answers, twelve out of fifteen respondents stated that the upcoming events feature has helped them in managing their study time because it allows the user to know the next important dates such as the test, quiz, and task submission. Therefore, they were able to manage their work efficiently. Nevertheless, the reminder feature should be simplified because most of the respondents were not understand how to set their timeline in the mobile-Moodle. Thus, the reminder could maximize the benefit of using MM in giving positive influence to the students' SRL.

The fourth question was the influence of the features in the mobile-Moodle on the students' SRL. Based on the questionnaire results all of the respondents' answers that the features provided in the mobile Moodle help them to develop their self-regulated learning. However, in this section, some of the participants commented that the user experience in mobile Moodle especially the layout of the features should be simplified. In terms of the feature types, the mobile Moodle has already had a lot of features that could help the user to maximize their self-regulated learning development. However, the display of the application also became an issue that should be improved. The display could be more attractive and user-friendly. . Khiat (2019) mentions in their study that the LMS which is user-friendly to be operated and has an interesting user experience could help develop the user's self-regulated learning.

The fifth question focused on Moodle that could help the student to build good communication and discussion with the lecturers and mates through the features in Moodle. All of the respondents answer that the discussion and message features help them to build good communication between the students-students and students-lecturer, vice versa. Jansen et al. (2018) also have the same opinion that an LMS should provide the feature that allows the user to communicate with each other. Further, it would help the user to share their opinion and create a discussion which would be good for the development of their self-regulated learning.

The last questions were asking about the respondents' opinions towards the advantages and disadvantages when they use the website Moodle mode and the mobile mode. Most of the respondents stated that the advantage of the website Moodle mode was the interesting web display and ease to be used. Further, the website mode is considered more comfortable because they could use Moodle with a widescreen display. However, recently they experienced a crash and delay when they use Moodle in prime time presumably because a lot of users access at the same time. Further, the MM allows never to experience delay trouble while the traffic is busy. Nevertheless, the respondents also stated that the mobile-Moodle display was not as interesting as the website Moodle. They stated that although it has the same features and content, the website Moodle has a more eye-catching display rather than the MM.

Based on the open-ended questionnaire result, the researchers highlighted two main results. The first was the MM features have influenced the students' SRL especially the schedule/upcoming events and messages. Those features have a positive influence on the students' SRL. However, the display and user experience should be easier and eye-catching. Most of the respondents commented that they were often confused about operating the features provided in MM. Therefore, to maximize the benefit of MM those issues should be improved.

In conclusion, the result of the questionnaire and interview showed that the students were successfully regulated their learning process with the influence of the Moodle mobile platform. It is shown in the students' response that most of the students were helped to regulate the learning process because of the easy access of getting the materials, information, and doing the tasks (Mtebe & Kondoro, 2016). Joo et al.(2016) also mention in the study that college students in Korea were helped to regulate their learning by the ease of using mobile Moodle. Further, in Thailand students' case, the easiness of downloading the materials, and other content in Moodle gives positive benefits to the students SRL (Suppasetseree, 2018). In addition to the easy access to the materials, the study found that using automated reminders in the mobile Moodle gives positive benefits to the students' SRL. The use of automated time management systems enables students to improve their SRL (Khiat, 2019). However, not all of the students know how to use the reminder feature in Moodle. Khiat (2019) mentioned that the user experience of an LMS could become the main factor that influences the success of online learning. In short, to make Moodle supportive to the students' SRL, the most feasible way to promote it is to create a friendly user experience. Therefore, based on the result of the questionnaire and interview, the researchers concluded that mobile-Moodle utilization in the learning process has a positive relationship to the students' SRL. The features provided in the mobile-Moodle, especially the schedule/upcoming events and messages, have given a positive impact on the students' SRL. Nevertheless, it could be more beneficial if there were some improvements in the user interface and display, especially the simple and easy features usage. In addition, the effectiveness of MM to support the students' SRL is indeed not the only determining variable. There were some other factors influencing the students' SRL such as the way the teacher designs the learning process and the approach the students organized their learning process. However, this research focused on the students' perception of the use of MM in supporting their SRL construction. Therefore,

there should be further research studies that investigate in details the other factors influencing the students' SRL besides the MM as a supporting tool.

CONCLUSION

The data in this research has demonstrated that the use of the Moodle mobile platform has a positive relationship with the perceived capacity of the students' SRL. According to the research findings, the learning plan which has been set out in the Moodle mobile platform can help the students to organize the students' time management. Further, the "upcoming events" feature also influenced the students to manage their work in completing the tasks on time. Most of the students have attempted to oblige themselves to finish the tasks in mobile Moodle before the due time because of the imagined reward if they can complete the work before the due time.

Nevertheless, there were other factors outside the scope of mobile Moodle affecting the students' SRL development, such as students' academic motivation, academic environment, and the situation around the students. All these variables also take an important role as the key factor of the SRL process (Gonzalez-Torres & Torrano, 2008). The user experience of Moodle can also become an issue that could affect the students' self-regulation in their online learning. Based on the follow-up questionnaire, the researchers found that most of the participants preferred to use the web-based Moodle or the website Moodle mode because it has a more interesting display and ease of use. On the other hand, the website Moodle mode still needs improvement especially the crash, lag, and trouble experience when the traffic of the user is high. On the other hand, some of the participants also prefer to use the mobile version because of the easy access beyond the boundary of time and space. Nonetheless, although this mobile version still requires improvement, such as in the eye-catching display and simple feature arrangement to optimize the user experience, the researchers can conclude that the use of mobile Moodle has a positive influence on the students' self-regulated online learning. Hence, since the limitation of the study is about the use of Moodle to help the development of students' self-regulated learning, the future research direction could have bigger participants and focus on the design of mobile Moodle that has an interesting and effective user interface yet focuses on simplifying the user experience.

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