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The Use Mobile Learning Game on Students' Self-Regulated Learning in Vocational High School

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ABSTRACT

Facilitating self-regulated learning for students has become a concern in the current covid pandemic. The digital platform is a learning solution that educational institutions currently use. This paper focuses on using mobile-based games for students' self-regulated learning. The application has been tested on media experts, materials, and media trials for students. An effectiveness test was carried out to determine the effect of games on students' self-regulated abilities. The findings showed that mobile-based games positively affected students' self-regulated learning. The analysis found a significant difference between the students' pretest and posttest scores. This finding also shows that mobile games can improve students' self-regulated learning.

Keywords: Mobile learning game, Self-regulated learning, Vocational high school.

INTRODUCTION

The world of education is experiencing the challenge of how learning can continue even in the emergency conditions of the COVID-19 pandemic. Due to the Covid-19 situation, educational institutions, teachers, students, and parents must be ready to face online learning (Moorhouse, 2020). With online learning, students are actively required to create self-regulated Learning because Learning is a process of building a conceptual framework from what is read, observed, own experience, or the experience of others. We never know that the knowledge produced by students is an interpretation of the experience of reality. The understanding of the knowledge formed will be meaningful because it comes from the analysis and experience of students (Dalimunthe, Sutisna, Zakiah, & Handayani, 2021). The self-regulated learning theory emphasizes that independent learning is regulated as students' ability to be involved independently and proactively in self-motivation and behavior that enhances goal achievement. In recent years, facilitating independent learning in students has become a concern, driven by evidence showing the decisive role of learners' self-regulatory behavior (Zimmerman, 1990). Self-regulated learning (SRL) is a process of students activating and maintaining cognition, behavior, and influence systematically directed. Achieving its goals includes motivational, strategic, metacognitive, and components (Schunk & Zimmerman, 2003; Winne & Hadwin, 1998).

Digital platforms are a learning solution that educational institutions currently use to carry out Learning (Williamson, Eynon, & Potter, 2020). (Gee, 2003) stated the importance of learning new literacy through games. Recently educational psychologists recognized the potential of digital games as a platform for studying SRL. Mobile learning games have the potential to promote self-directed learning within a social constructivist framework. Based on research (Samaniego, 2019), games can improve students' independent learning. The frequency of self-study increases when using games in educational practice. Mobile learning games can be an ideal innovation for students to "learn how to learn." In recent years young people have been very attached to mobile phones and games. The motivational factor inherent in the game attracts the attention of the youth, which compels them to play the game for a long time. For this reason, GBL can be applied in the world of education. Moreover, these environments provide a promising context for studying self-directed learning (SRL) due to the complex but autonomously based settings they are capable of.

Based on the problems that have been discussed above, this paper shows the ways researchers apply learning media as a means to facilitate self-regulated learning of students. The development of mobile learning games is expected to improve self-regulated learning for students. This paper uses the Zimmerman self-regulated indicators domain, where there are not many studies that discuss the three Zimmerman indicators.

LITERATURE REVIEW

Self-Regulated Learning

Self-regulated learning (SRL) terms describe students' behavior to be active in controlling the learning process (Schunk & Zimmerman, 2003). The SRL model generally consists of metacognitive, motivational, and strategic components. It manifests as a person's ability to evaluate and effectively control cognitive processes and motivation during learning in a particular domain (Pintrich, 2000; Winne, 2001; Zimmerman, 2000) in this paper, using Zimmerman's self-regulated learning indicators. The researcher

chose Zimmerman's indicators because it covers more of the spectrum of self-regulated learning. Rehearsing There are 11 aspects of Self-regulated learning in table 1.

Table 1. Indicators Self Regulated Learning Zimmerman

No.	Dimension	Indicators
1	Cognitive	Goal Setting and Planning Rehearsing and Memorizing Organizing and Transforming Self Evaluating
2	Motivation	Self Consequence Seeking Social Assistance Environmental Structuring
3	Behavior	Keeping Records and Monitoring Seeking Information Reviewing Records Other/Help-Seeking

Mobile Learning Game

In recent years, games in learning have become very popular. (Braghirolli, Ribeiro, Weise, & Pizzolato, 2016) Various terms refer to these games, such as digital educational games, persuasive learning games, GBL, epistemic games, instructional games. Mobile learning games are flexible and can be used anywhere and anytime. In this era, young people have been bound by computers and consoles. The motivational factor inherent in the game attracts the attention of the youth, which compels them to play the same game for a long time. These devices can be owned at a relatively low cost (Bere & Rambe, 2019). Mobile learning allows students to expand discussions and review learning material outside of class hours and take their devices wherever they are. (Looi et al., 2016) Mobile devices allow students to learn, create knowledge, and interact with multiple content. Thus, mobile learning supports the constructivist view of Learning (Padirayon, Pagudpud, & Cruz, 2019) because it provides a learner-centered pedagogy (Crompton & Traxler, 2019) and can increase student's independent learning towards a learning goal (Bartholomew, 2019). Based on research (Samaniego, 2019), games can improve students' independent learning. The frequency of self-study increases when using games in educational practice.

RESEARCH METHOD

The main objective of this study was to answer the following two research questions:

1. How is media validation in mobile learning games?
2. What is students' level of self-regulated learning after using mobile learning games?

This game was applied to 60 Vocational High School students in Surakarta, Indonesia, and this study uses the RnD (research and development) approach. Research development design using 4-D models *(*Four D Models*)* from (Thiagarajan, Semmel, & Semmel, 1974). In the 4D model, the stages are defined, designed, developed, and disseminate. The instrument used in this study was one set of achievement test scores (pre and post) to see the intervention before and after using the media. This study used a questionnaire to obtain data. Correlation technique product-moment from Pearson, there are 20 valid questions, which can be seen in table 2.

Table 2. Self-Regulated Learning Question Indicators

No	Indicators	Question Item	
		Positive	Negative
1	Goal setting and planning	2.5	
2	Rehearsing and Memorizing	7	18.15
3	Organizing and Transforming	11	12
4	Self Evaluating	4	13
5	Self Consequence	14	3
6	Seeking Social Assistance	8	16
7	Environmental Structuring	9	
8	Keeping Records and Monitoring	1	20
9	Seeking Information	10	17
10	Reviewing Records	6	
11	Other/Help-Seeking	19	

RESULTS

Validation Mobile Learning Games

This validation activity requires an assessment instrument in the form of a validation sheet submitted to four expert validators. Expert validation is done by asking for expert consideration, namely: Two Education Technology lecturers as media experts and two teachers as material experts. The validation sheets that each validator has filled out are then analyzed to determine the quality of the learning media and whether the learning media are ready to be used for trial activities or need to be revised before being tested. Criticisms and suggestions from expert validators are used as a reference to make improvements and refinement of learning media.

After expert validation was carried out, field trials were carried out to determine the results of implementing Mobile learning games in classroom learning, including measuring the effects of game validation carried out by students. The test stages are carried out with one-on-one trials, small group trials, broad group trials. The results obtained from this stage are in the form of a Mobile learning game. A revised Validation of mobile game media can be seen in table 3.

Table 3. The Result Validation Mobile Learning Game

No	Validator	Percentage Value	Category
1	Media 1	96%	Very Good
2	Media 2	87%	Very Good
3	Material 1	88%	Very Good
4	Material 2	94%	Very Good
5	Practitioner 1	83%	Good
6	Practitioner 2	84%	Very Good
7	Practitioner 3	85%	Very Good

Student Self-Regulated Learning After Using Mobile Learning Games

This study uses indicators from Zimmerman because it covers more of the spectrum of self-regulated learning. They were setting repeating and remembering, goals and planning, self-evaluation, self-consequences, seeking social assistance, organizing and

transforming, managing the environment, making and checking notes, seeking information, reviewing notes and textbooks, and seeking other help. To answer the second question in the study, the researcher used descriptive statistics to find out the significant difference between the pretest and posttest scores. The results of the study are shown in table 4.

Table 4. The results of pretest and posttest self-regulated learning

No	Indicators	Achievement	
		Pre Test	Post Test
1	Goal setting and planning	67.5%	88.3%
2	Rehearsing and Memorizing	63.2%	87.1%
3	Organizing and Transforming	45.6%	88.5 %
4	Self Evaluating	55.8%	87.8%
5	Self Consequence	58.1%	85.3%
6	Seeking Social Assistance	64.7%	86.3%
7	Environmental Structuring	54.8%	88.7%
8	Keeping Records and Monitoring	67.7%	88.3%
9	Seeking Information	63.5%	83.7%
10	Reviewing Records	59.7%	86.7%
11	Help-Seeking	52.7%	86.7%

Based on table 4 regarding the results of self-regulated learning, it was found that students' self-regulated learning at the time of the pretest was still in the poor category. Meanwhile, 25 students (41.7%) and 35 students (58.3%) did not meet the indicators in self-regulated learning. Meanwhile, in the posttest results, all students have completed the indicators of self-regulated learning. There are ten indicators of self-regulated learning of students belonging to the very good category and one indicator belonging to the good category. Meanwhile, in the posttest, the number of students belonging to the very good self-regulated learning category was 40 students (67%), and 20 students (33%) were in a good category. It can be concluded that mobile games positively impact students' self-regulated learning.

DISCUSSION

This research was conducted during the COVID-19 pandemic emergency, especially in Surakarta, where learning had to be done at home. Teachers and schools have tried to use various media to help the learning process run. One of the challenges in online learning is increasing student motivation in knowledge and building independent student learning so that students have awareness in learning even though they are separated. It is undeniable that all young people, especially in Surakarta, already use cell phones, and many students often play games. This makes researchers provide innovation in learning, namely the use of games in the learning process.

Based on games, it can promote self-directed learning within a social constructivist framework and emphasize problem-solving. GBLE development is very complex and must be adapted to user needs. This poses a significant challenge in the design of GBLE studies (Lajoie & Acevedo, 2006; Schraw, 2007). (Gaydos, 2015) explain that games can be applied to learning but still need a good understanding of game design. Therefore, the development of mobile-based games combines affective, cognitive, motivational, and

sociocultural perspectives to achieve GBL's full potential. In addition, researchers have also validated various experts and product trials to get product results that students can appropriately use.

This study states that mobile-based games can be a means of self-regulated students. It can be seen that there is a significant increase in the value at the time of pretest and posttest. Students believe this mobile-based game to be a solution for online learning, and students can learn while playing. Students are enthusiastic when education is associated with games because it is considered very relaxed. There is material that is clear and easy to understand. This finding also supports (Samaniego, 2019) research that games can increase students' independent learning. The frequency of self-study increases when using games in educational practice.

CONCLUSION

The conclusion of this study, the validation of mobile learning media by media experts, material experts, and practitioners can be categorized as very good. Based on the study results, there is a positive effect when learning using mobile learning games. There is an increase in the percentage value on pretest and posttest in each indicator of self-regulated learning. Pretest results, 25 students (41.7%) and 35 students (58.3%) did not meet the indicators in self-regulated learning. Meanwhile, in the posttest results, the number of students belonging to the very good self-regulated learning category was 40 students (67%), and 20 students (33%) were in a good category. It can be concluded that the use of mobile learning games can be an alternative media for online learning because of the urgency of online learning, namely the development of students' self-regulated learning abilities.

LIMITATION

These findings contribute significantly to self-regulated learning and technology in the covid pandemic. This aligns with the expectation that games can increase students' self-regulated learning. The limitation of this research is that a game can only be run on Android and HTML operating systems. So that if the student's handphone is not an Android operating system, it must use the Html one. It is hoped that further research will be able to complete the shortcomings in this study.

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DECLARATION OF CONFLICTING INTERESTS

There are no conflicts of interest that exist.

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