ANALYSIS OF STUDENT SELF-REGULATED LEARNING IN AN EFFORT TO INCREASE THE EFFECTIVENESS OF ONLINE LECTURES IN THE PANDEMIC PERIOD

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Abstract. The purpose of this study was to determine the effectiveness of online learning for students using the Learning Management System (LMS) in terms of problem solving abilities and self-regulated learning in the linear program material for the Education Supervision course. This research was conducted at the Primary School Teacher Education Study Program, Pakuan University in class semester 5A in 2021. This research is an experimental research with 1) One-Shot Case Study methods, to obtain data regarding students' problem solving abilities and 2) One-Group Pretest- Posttest Design, to obtain data regarding student self-regulated learning. Based on the results of the research, 1) online learning with LMS on Educational Supervision material is effective in terms of problem solving abilities of students of the Primary School Teacher Education Study Program, Pakuan University and 2) online learning with LMS on Educational Supervision material from self-regulated learning of students of the Teacher Education Study Program Pakuan University Elementary School.

Keywords: self-regulated learning; learning management system; educational supervision.

I. INTRODUCTION

Indonesia is currently facing the ongoing Covid-19 pandemic. Not only the economic, social and technological sectors, but the education sector is now also being affected by this pandemic. Various efforts have been made by the government to save Indonesian citizens from this deadly disease. Various appeals spread widely, aid both moral and material mobilized. One form of appeal in the education sector is a change in the teaching and learning process which was originally carried out offline (outside the network) to online (in the network). Learning can still be carried out through online-based learning in the form of WhatsApp, Google Classroom, Zoom, Edmodo and so on. With the convenience of online learning facilities, it is hoped that lectures will continue to be carried out well even though the pandemic is still enveloping, lecturers can still deliver lecture material in accordance with the courses taught and students can also understand lecture material even though learning is done online. Unfavorable academic achievement of students can be caused by various things, especially their learning behavior, both inside and outside the lecture class[1]. The learning behavior of new students is greatly influenced by the changes in the academic environment they encounter[2]. Most of the new students agree that the lecture system is different from the learning system in early semester [3]. Many new students have not been able to adjust to the changes in the academic environment they encounter. Berry J. Zimmerman [4] said that one variable that influences academic achievement in a student is the student's self-regulated learning ability. The learning outcomes obtained

will depend heavily on the skills of a learner in implementing their self-regulation strategies in learning. Self-Regulated Learning behavior is a learning action that is an individual's own initiative which includes setting goals (goals) and regulating (making rules) for how or what methods are carried out by individuals in order to achieve these goals, self-monitoring (self-regulated) monitoring), time management, and regulation of the social and physical environment of individuals. Furthermore, Ormrod [5] tries to describe the processes contained in Self-Regulated Learning, including: 1) goal setting, 2) planning, 3) self-motivation, 4) attention control, 5) flexible use of learning strategies, 6) self-monitoring, 7) seeking appropriate help (appropriate help seeking), and 8) self-evaluation (self-evaluation).

The Learning Management System (LMS) that has been created and recognized by the government in online teaching and learning activities is called the Online Learning System (SPADA) which is in accordance with the regulation of the minister of education and culture number 109 of 2013 concerning the implementation of Distance Education (PJJ) in higher educatio. The development of the online education system is due to the higher commitment by the government in providing educational services. Online education engages with information technology providing solutions to eliminate problems caused by space and time [6]. Pakuan University has used these rules during the Covid-19 pandemic with the website name https://lms.unpak.ac.id, as one of the efforts to continue to provide the best educational services for students and easily accessible by anyone. Electronic-Learning (E-Learning) is a form of education that utilizes information and communication technology to access online teaching

and learning (Alqudah **[7]**). According to the Minister of Education and Culture No. 19 of 2014 that what is meant by electronic learning (e-learning) is learning that utilizes information packages based on information and communication technology for the benefit of learning that can be accessed by students anytime and anywhere. Previously, online distance education was considered part of non-formal education, but under these conditions it will gradually replace the formal (face-to-face) education system if the Covid-19 situation lasts a long time. Online learning has different elements from traditional face-to-face classes and so students' online characteristics are also different (Martin **[8]**).

Martin et al. **[8]** continued that as educators must be able to understand student characteristics, namely from the aspect of 1) Self-regulation, which involves controlling student behavior, emotions, and thoughts to achieve learning and performance goals, 2) motivation, namely activities directed by student goals that are instigated and supported such as beliefs, and changes in behavior, 3) Academic, namely educational characteristics such as type of education and level of education, 4) attitude in the form of student characteristics that describe student feelings or emotions such as satisfaction, 5) cognitive, namely student characteristics that describe feelings or student emotions such as satisfaction of student characteristics related to cognitive elements such as attention, memory, and intelligence (for example, learning strategies, study skills, etc.) and 6) demographics in the form of student characteristics related to information such as age, gender, language, social economic status, da n cultural background. Internet network connectivity in online learning is important. The government has made efforts to prepare quotas for students, teachers, students and lecturers in online learning. Online activities are also provided for students to access; however, students accomplish this independently, at their own pace (Patricia **[9]**). The use of technology, when used effectively, enables students and teachers to engage and collaborate with each other and more and more successful transitions to online learning are influenced by user intent and use of technology. E-learning is in the learning process where one can learn anytime and anywhere. Online learning requires students to be able to manage their learning activities so that self-regulation is needed. As stated by (Ren **[10]**) that online learning requires self-regulation in students and students strive to manage, set learning targets, be responsible for their own learning, and direct complex learning activities so that by regulating their own learning important in increasing the learning effectiveness of students. Educating students to become independent learners who can think critically, make connections between existing and new information, and process information in depth has become a priority for education today. As explained (Weinstein & Palmer **[11]**) using prior knowledge, experience, attitudes, beliefs and reasoning to create a sense of new information is essential for success in the 21st century school and workplace. The difference between someone with and without experience is not only the amount of knowledge

they have, but also, and perhaps more importantly, the way in which this new knowledge is acquired and organized.

Pintrich (Ren **[10]**) stated that self-regulated learning consists of 3 strategies namely 1) Cognitive learning strategy: this strategy can be applied simply to memory (for example, remembering information, words, or lists) or more complex tasks that require understanding information; 2) Metacognitive and self-regulatory strategies: As psychological constructs, metacognitive status has been fostered by problems related to metacognitive knowledge and awareness with metacognitive control and self-regulation. Self-regulation will then refer to monitoring, controlling, and regulating their own cognitive activity and actual behavior, and; 3) Resource management strategy: This strategy is used by students to manage and control their environment. The framework in self-regulated learning namely 1) describes self-regulated learning as a learning cycle consisting of metacognitive to the learning process and, monitoring learning outcomes, and controlling the learning process; 2) Teaching with self-regulated learning must help students to use diagnostic cues, which means being able to predict their performance later; 3) Being able to do elaboration (building new knowledge and linking it with prior knowledge to solve problems); 4) learning through a series of topics and tasks (ie, levels of instructional sequence).

In this Education Supervision course, students have actually studied it from semester 1. This cannot be separated from the students' prior knowledge in understanding the Education Supervision course. Prior knowledge is one of the important things in learning. As stated by (Ren **[10]**) that students' prior knowledge is believed to be one of the most important factors influencing learning effectiveness, learning achievement, and if students' prior knowledge is still incomplete it will interfere with learning. Furthermore, even in online learning, students with prior knowledge levels have different perceptions about the features of e-learning content, which in turn affects the effectiveness of their e-learning (Ren **[10]**). When students with low prior knowledge are at a disadvantage when learning new material or concepts, they need more guidance and assistance. As future teachers, students must be able to have basic skills in educational supervision courses. The important role that self-regulated learning (self-regulated learning) strategies play in online learning, it is important to assess students' use of self-regulated learning strategies and to identify students who tend to struggle online so that institutions and instructors can provide timely support (Li et al. **[12]**). Based on this description, researchers want to know the effectiveness of online learning during the Covid-19 pandemic in terms of problem solving abilities and student self-regulated learning in the Education Supervision course.

II. RESEARCH METHODS

This research uses the type of experimental research (experimental research). The designs used in this study were 1) One Shot Case Study, 2) One-Group Pretest-Posttest

Design. This research was conducted in the Elementary School Teacher Education Study Program, Pakuan University. The population in this study were all students in the fifth semester of the 2020/2021 academic year, consisting of 4 classes and each class was a heterogeneous student. Sampling in this study used a random sampling technique, so that the fifth semester students in class A were selected. The data in this study were taken directly by the researcher by specifying several techniques and data collection instruments. Data collection techniques are the methods used to collect data [13]. The techniques used in this study are giving problems solving ability questions on linear programming material. Provide a self-regulated learning questionnaire. Documentation in the form of data on the results of working on problem-solving ability questions and self-regulated learning questionnaires. The instruments for collecting data in this study consisted of test and non-test instruments. The test instrument is in the form of problem-solving ability questions and the non-test instrument is in the form of a self-regulated learning questionnaire. This study uses inferential statistical analysis. Using the normality test and homogeneity test for the prerequisite test [14]. While testing the hypothesis using the one sample t-test and paired samples t-test

III. RESULTS AND DISCUSSION

Description of student data given a problem-solving ability test in Educational Supervision. The test is given after the treatment (treatment). In addition, there are indicators of problem-solving ability which consist of four aspects, namely understanding the problem, solving the plan, implementing the solution, and checking again. There are results of initial and final self-regulated learning data described as follows.

Table 1. Description of Self-Regulated Learning on Educational Supervision

Description	Beginning	End
n	30	30
Average	63,57	71,33
Maximum value	78	85
Minimum value	48	59
Std. deviation	7,509	6,205
Variance	58,392	38,506

Based on the table above, student self-regulated learning in online learning has increased. Both of the minimum value and maximum value. When viewed from the classification based on M (ideal mean), S (standard deviation), X (score). The categories used use the criteria developed by Azwar (2014: 163). So that the categories of self-regulated learning are obtained as follows.

Table 2. Description of Self-Regulated Learning on Educational Supervision

score (X)	number of students		classifications
	beginning	end	
$X > 96$	0	0	very high
$80 < X \leq 96$	0	2	high
$64 < X \leq 80$	12	24	currently
$56 < X \leq 64$	18	4	low
$X \leq 56$	0	0	very low

After all the data was collected, the researcher conducted an analysis of the data obtained. Data analysis was carried out in the form of testing the initial conditions and the final conditions regarding the results of self-regulated learning questionnaires and the results of problem solving abilities. First, the assumption test is carried out, namely the normality test using the Kolmogorov Smirnov test with the help of IBM SPSS 20 for windows, the significance value obtained from the pretest problem solving ability is 0.068 and self-regulated learning is 0.113. The significance value of the problem solving ability posttest is 0.438 and self-regulated learning is 0.440. Because the significance value is more than 0.05, the pretest score resulting from the measurement results of the problem-solving ability of Educational Supervision and students' pretest self-regulated learning towards Educational Supervision is normally distributed. The data is presented in the following table.

Table 3. Normality test results with the Kolmogorov Smirnov test for self-regulated learning questionnaires

	beginning	end
Sig. Self-regulated learning	0,690	0,714
Interpretation	Ho accepted	Ho accepted
Conclusion	Normal	Normal

Table 4. Results of the Normality Test with the Kolmogorov Smirnov test for problem solving abilities

	description
Sig. problem solving abilities	0,690
Interpretation	Ho accepted
Conclusion	Normal

Furthermore, in hypothesis testing, the first hypothesis test is to answer the first problem formulation, namely whether the online learning model using the Learning Management System is effective in terms of student problem solving abilities. There are 2 hypothesis tests that are carried out, namely as follows
1. Test 1

Based on the One sample t-test, sig (2-tailed) = 0.000 is obtained. Because the hypothesis is a one-party test, sig = 0.000 which when compared with $\alpha = 0.05$, then 0.000 <0.05. This shows that $H0$ is rejected, which means that the

average value of the problem-solving ability test is more than 70.

Table 5. One sample t-test results

Test	Sig (2- tailed)	t count
One sample t-test	0.028	2.307

2. Test 2

Based on the one-sample proportion test, Zcount = 0.21. If Zcount = 1.05 compared to Ztable = 1.05 = 0.8531, then 1.05 > 0.8531. This shows that $H0$ is rejected, which means that the number of students who score more than 60 is more than 75%.

Table 6. Proportion Test Results

Test	Zcount
Test the proportion of one sample	0.21

The results of these calculations are that online learning with the Learning Management System is effective in terms of the ability to solve Educational Supervision. Implementing an online learning environment is not only a technical issue but also a pedagogical and instructional challenge. Teaching students to become independent learners is an ongoing goal for educators, but not all students have the self-regulation skills needed for online learning. As stated (Patricia [9]) it is important to train new technology students before using it. This is so that students are able to adapt in learning. Online learning will prevent massive transmission of the Covid-19 virus. But without face to face it will have an impact. As stated (Deshwal [15]) online baljara is useful for adopting new technologies, building confidence to face competitive exams, motivating participants to develop questions in discussion forums and being encouraged to submit input on concepts and time management.

The use of the Learning Management System has an impact on performance and performance for students which shows a strong correlation between activity and test scores (Baragash & Al-samarraie [16]). The lessons provided not only use virtual learning and learning files but also provide learning videos. This is what makes students effective in online learning. As stated by (Lage-Cal et al. [17]) that learning by using text and learning videos will be meaningful and effective which results in students having high self regulated learning. Next is testing hypothesis 2, testing the second hypothesis to answer the second problem formulation, namely whether online learning is effective in terms of student self-regulated learning. There are 2 hypothesis tests that are carried out, namely as follows.

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1) test 1

Table 8. Paired sample t-test results

Test	Sig (2- tailed)	t count
Paired sample t-test	0.000	-4.452

The first test aims to determine whether there is an increase in initial and final self-regulated learning scores. Based on the paired sample t-test, sig (2-tailed) = 0.000 was obtained. Because the hypothesis is a one-party test, sig = 0.000 = 0.000 which when compared with $\alpha = 0.05$, then 0.000 <0.05. This shows that $H0$ is rejected, which means that the average score of the final self-regulated learning is greater than the average score of the initial self-regulated learning.

2) Test 2

Table 9. One sample t-test results

Test	Sig (2- tailed)	t count
One sample t-test	0.000	-7,605

The second test aims to determine the final average self-regulated learning score of more than 80. Based on the one sample t-test, sig (2-tailed) = 0.028 is obtained. Because the hypothesis is a one-party test, sig = 0.000 = 0.000 which when compared with $\alpha = 0.05$, then 0.000 <0.05. This shows that $H0$ is rejected, which means that the average final student self-regulated learning score is more than 80.

Martin et al.[8] said that learners who do online successfully have self-regulation in online learning. From the Journal (Patricia [9]), said that students who are confident in implementing various self-managed strategies are more likely to complete their academic assignments. Emergency online learning requires a certain level of self-regulation skills in which students must manage their learning process (at least more so than in face-to-face instruction). (Choe [18]) stated that consistent academic and emotional support reported by adolescents is significantly related to adolescent academic achievement and self-regulated learning. Practitioners and teachers must provide appropriate educational resources to parents to enhance their adolescent's academic achievement. Practitioners and teachers, together, encourage parents to share information with their children, and appropriate emotional support to nurture their children into independent learners. All of these methods are especially effective for parents of young adolescents who are just going through the transition from elementary to middle school, and developmental changes. Finally, practitioners must be sensitive to cultural backgrounds when interpreting differences in perceptions of parental support and their relationship to academic achievement in young students. The importance of self-regulated learning for successful learning in open online education. In learning seeks to support self-regulated learning instructions and provide practical advice to students. Instructing students the importance of self-regulated learning and how to engage in successful self-regulated learning appears to be key when implementing self-regulated learning

interventions in online education. The positive effects of self-regulated learning instruction in open online education are in line with the results found with (larger) interventions containing self-regulated learning instruction in higher education.

León et al. **[19]** stated that self-regulated learning is a component of independent learning, referring to the ability of students to focus attention, direct effort, and persist even when doing so is not easy or enjoyable. Some students will certainly find Educational Supervision difficult and not inherently fun or interesting. Furthermore, students often experience anxiety and evaluative threats from pressure related to standardized tests and achievements in Educational Supervision which often determine the opportunities and future of students in the STEM area.

Self-regulated learning is needed for students to overcome obstacles or distractions so they can learn and achieve. Educating students to engage in profound information processing that they can retain and then apply that information or skills in a critical, constructive, or adaptive way is one of the main goals in education in the 21st century. Researchers have found that deep processing predicts academic performance (León et al. **[19]**). In other words, students' in-depth processes may seem obvious and specific only to school subjects that encourage or are taught to think in innovative or critical ways. For example, if students are taught in a formula-in-progress manner, then in-depth processing may not necessarily contribute to their final exam score in algebra. In addition, the relationship between deep processing and Educational Supervision achievement may be moderated by factors such as teaching and assessment methods.

Alghamdi et al. **[20]** stronger beliefs in students' academic abilities and performance are better able to regulate their multitasking behavior in traditional university settings (i.e., face-to-face classrooms) compared to online learning environments, where there is usually little or no supervision or accountability. Specifically, a confidence level of self-regulated learning is desirable for success in an online learning environment. self-regulated behaviors to control multitasking activities are required in online learning environments compared to those that have been used routinely. In online learning, there is less interaction between teachers and students, which will result in cooperation between students. (Broadbent & Poon **[21]**) convey reduced or reduced teacher interaction, allowing students to seek to use more available alternatives (i.e., co-workers) for assistance. This may contribute to increasing the importance of peer learning in online settings compared to traditional classrooms. Furthermore (Broadbent & Poon **[21]**) conveying future online learning activities, colleagues and academic achievement in an online environment must consider: (1) using actions other than those used in traditional classrooms, such as activity discussion boards, and (2) including passive and active behavior on discussion boards. While increasing student use of peer learning is a challenge in an online learning environment, students should be encouraged to participate (both passively and actively) on discussion boards. Self-regulated learning strategies time management, metacognition, critical thinking, and regulation of effort were found to have a significant positive correlation with academic success in online settings, although these effect sizes were smaller than those found in traditional classrooms.

IV. CONCLUSION

Based on the results of data analysis and discussion, it was concluded that online learning with the Learning Management System in the Education Supervision course in terms of the problem solving abilities of Pakuan University Elementary School Teacher Education students and online learning with the Learning Management System in the Effective Education Supervision course in terms of self-regulated learning Pakuan University Elementary School Teacher Education students. Furthermore being able to explore how mediating factors (such as motivation) work together with self-regulated learning to enhance our understanding of the influence of learner self-regulation on academic success in online learning in real life.

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