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To cite this article: BR Rosyadi *et al* 2021 *J. Phys.: Conf. Ser.* **1779** 012072

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# Self-Regulation using Moodle Virtual Learning Environment (VLE) in Solar System Practice

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**Abstract.** The purpose of this study is to measure the level of self-regulated students obtained from their academic achievements when learning to use Moodle virtual learning environment (VLE) in the practice of the solar system. This study involved 37 students of grade IX junior high school in Paiton Probolinggo, of which 18 students in the experimental group studied using Moodle Virtual Learning Environment (VLE), and 19 students in the control group who studied with conventional learning. In this study, students' self-regulated measures were measured using a 4-point Likert scale. The results of this study indicate that the level of self-regulated students who learn to use Moodle virtual learning environment (VLE) is higher than students who study conventionally.

## 1. Introduction

The best way to learn in a student-oriented perspective is students themselves. The student-oriented learning model provides a meaningful learning experience so that learning becomes fun. The teacher's role is no longer a source of information, but rather a facilitator, motivator, and moderator in student learning activities [1]. Students gain freedom in exploring their learning experiences by interacting and sharing their knowledge in discussions utilizing information and communication technology [2]. The discussion activity is able to direct students to achieve learning goals and understand each other's learning needs.



Self-regulated learning becomes an integral component of formative learning functions. This function is a learning culture that encourages students to practice self-regulation learning strategies when taking part in an activity or when studying or doing homework. Self-regulated learning strategy is a set of plans that students can use to achieve their goals. These action plans are based on the phases, processes and sub-processes of self-regulation learners. The use of self-regulated learning strategies reduces anxiety and increases self-efficacy, which is directly related to achieving goals [3] and academic achievement.

Reform of learning through information and communication technology provides benefits for the development of education. The implementation of technology in learning is relevant to global demands in the millennial era through the concept of electronic learning. Applications in technology really help to learn to be run [4]. One application used in e-learning is Moodle. By using Moodle, teachers can build systems with the concept of e-learning and distance learning [5]. With this concept, the learning system is not limited in space and time, educators can provide learning material anywhere, so can students take part in learning anywhere [6]. In addition, the Moodle application is able to present teaching materials, evaluation questions, and assignments that can be monitored on progress and grades.

Learning using Moodle contributes and places great emphasis on educational experiences. Moodle provides a flexible environment for learning communities according to pedagogical principles. Using Moodle clearly facilitates learning and communication interaction between the academic community. In addition, students will more easily receive the latest information from educators and friends. Therefore, the purpose of this study is to measure the level of success of independent learning and academic achievement of students using the Moodle Virtual Learning Environment (VLE) in the practice of the solar system.

## 2. Self-Regulated Learning

Self-regulated learning is learning that occurs at the initiative of students who have the ability to arouse themselves so that they can influence their thoughts, feelings, strategies and behaviours aimed at achieving goals [7]. Self-regulated learning as the ability of students to actively participate in the learning process, both metacognitive, motivational and behavioural [8], so that individuals who learn, can actively compile and determine learning goals, plan and monitor, regulate and control cognition, motivation, and the environment to achieve the goals set. Therefore, the problem of student initiative becomes very important to start this ability. Students who are active, creative, dynamic will usually have many initiatives to carry out activities, so it can be estimated that students who have the ability to self-regulated learning tend to exhibit dynamic and active behaviour [7].

Self-regulated learning integrates many things about effective learning. Knowledge, motivation [9] and self-discipline or volition are factors that can influence self-regulated learning [10]. Self-regulated learning strategies include activities that focus on learning goals that can be directly carried out, can be modified and can be maintained/maintained all learning activities [11]. The components of Self-regulated learning, namely; Self-evaluating, organizing and transforming, goal setting and planning, information seeking, keeping records and monitoring, environment structuring, rehearsing and memorizing, seeking social assistance, self-consequence, reviewing and records [12]. Through self-regulated learning, it is expected to increase self-confidence (self-efficacy), self-control, motivation [13], social support, expertise and problem-solving style which are the factors that cause procrastination. The self-regulation strategy in higher learning is expected to reduce the level of academic

procrastination and increase academic achievement as well. the self-regulated learning strategy proved to be very efficient in improving learning achievement [14].

### 3. Moodle Virtual Learning Environment

Moodle stands for Modular Object-Oriented Dynamic Learning Environment is an application that has many features and is suitable for learning needs. Moodle is a course content management (CMS), which was first introduced by Martin Dougiamas [15]. This application is made for teaching and learning activities by utilizing the internet network through a specially built website and using the social constructionist pedagogy principle [16], where can help teachers in the learning process from all points of view, where not only do the publication of information but can pour all the thoughts that will be outlined [17].

The application used is Moodle based on LMS (Learning Management System). LMS is a system designed to display, track, report, and organize learning content, student progress, and student interaction [18]. LMS has the ability to manage web-based learning administration such as registering and administering test scores, providing teaching materials in various formats.

Moodle does not force a teacher to change his teaching style, but the development of e-learning based applications can support each other, his development will continue to be adjusted to support the pedagogical learning process as the main thing [17]. Moodle has various facilities that can be useful to support learning activities. Facilities contained in Moodle include assignments, chat, forums, quizzes, and surveys [19]. Learning with Moodle-based e-learning will facilitate and facilitate, not only students but also lecturers in the learning process.

### 4. Research Method

This study uses a quasi-experimental design in the pre-test and post-test non-equivalent control group. The hypothesis tested in this study is the difference in the average score of self-regulated learning of students who learn using Moodle virtual environment learning with students who study conventionally as many as 37 students divided into two groups, 18 students in the experimental group and 19 students in the control group. This study uses a self-regulated learning instrument developed by Onah and Sinclair (2015) through the MOOC online self-regulated questionnaire (MOSLQ). MOSLQ questions use the dimension of goal setting, task strategy, time management, structuring environment, help-seeking, and self-evaluation.

### 5. Result and Discussion

This study examines differences in the academic achievement of students with different levels of self-regulated. The difference test is shown in the following table 1;

**Table 1. Improved student academic achievement in the experimental and control groups**

Paired Samples Statistics				
	Mean	N	Std. Deviation	Std. Error Mean
Pretest	70.08	37	4.751	.781
Posttest	81.57	37	4.549	.748

**Paired Samples Test**

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-11.486	5.274	.867	-13.245	-9.728	-13.249	36	.000

The findings in this study are shown in table 1, that students' academic achievement increases when learning to use Moodle virtual learning environment. Paired sample tests showed that there was a significant increase in students' pre-test and post-test ( $M = 11,486$ ,  $SD = 5,274$ ), a significant increase in  $t(36) = -13,249$  with a probability of significance at the level of  $p < 0.05$ . This shows that learning with Moodle virtual learning environment can improve student academic achievement.

The study also examined differences in the academic achievement of students who have different levels of self-regulated. This is shown in table 2 as follows,

**Table 2. Differences in mean scores of students' academic achievement based on self-regulated**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
High	18	84.39	2.253	.531	83.27	85.51	80	87
Low	19	78.89	4.593	1.054	76.68	81.11	70	86
Total	37	81.57	4.549	.748	80.05	83.08	70	87

The results of data analysis in table 2 show that the average score of academic achievement of students who have high self-regulated is 84.39. This is higher when compared to the acquisition of an average score of students with low self-regulated academic achievement of 78.89. There is a difference in the difference in the average score of 5.5 with a probability of  $p < 0.05$  as shown in table 3. This shows that self-regulated also gives a difference in student academic achievement.

**Table 3. Analysis of variance**

Academic Achievement

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	279.014	1	279.014	20.953	.000
Within Groups	466.067	35	13.316		
Total	745.081	36			

## 6. Conclusion

Based on the results of data analysis, students who learn to use Moodle virtual learning environment (VLE) have differences in academic achievement with students who learn through conventional learning. For the aspect of self-regulated, students with high self-regulated, academic achievement are better than students with low self-regulated.

## References

- [1] K. Rahman, A. Wahid, I. Afandi, M. M. E. I. Bali, and L. Hakim, "Effectiveness of Teams Teaching-Hybrid Learning (TTHL) in Higher Education," in *WESTECH*, 2019, pp. 1–6, doi: 10.4108/eai.8-12-2018.2284036.
- [2] H. Baharun, "Management information systems in education : the significance of e-public relation for enhancing competitiveness of higher education," *J. Phys. Conf. Ser.*, vol. 1175, no. 1, 2019, doi: 10.1088/1742-6596/1175/1/012151.
- [3] M. M. E. I. Bali and I. Masulah, "Hypnoteaching: Solusi Siswa Learning Disorder," *At-Turats J. Pemikir. Pendidik. Islam*, vol. 13, no. 1, pp. 89–103, 2019, doi: 10.24260/at-turats.v13i1.1188.
- [4] C. Muali *et al.*, "Free Online Learning Based on Rich Internet Applications; The Experimentation of Critical Thinking about Student Learning Style," *J. Phys. Conf. Ser.*, vol. 1114, no. 1, 2018, doi: 10.1088/1742-6596/1114/1/012024.
- [5] A. Fauzi, A. Mundiri, and U. Manshur, "E-Learning in Pesantren : Learning Transformation based on the Value of Pesantren E-Learning in Pesantren : Learning Transformation based on the Value of Pesantren," *Phys. Conf. Ser. Pap.*, vol. 1114, 2018, doi: 10.1088/1742-6596/1114/1/012062.
- [6] M. Mushfi and E. Iq, "Implementasi Media Pembelajaran Berbasis Teknologi Informasi dan Komunikasi dalam," *Tarbiyatuna*, vol. 3, no. 1, pp. 28–38, 2019.
- [7] M. S. Learning, "Peningkatan Prestasi Belajar Siswa Melalui Self-Regulated Learning," *Cakrawala Pendidik.*, vol. 1, no. 1, pp. 1–19, 2004, doi: 10.21831/cp.v1i1.4858.
- [8] M. K. C. Filho, *A Review on Theories of Self-Regulation of Learning*. Bull. Grad. Shool Educ. Hiroshima Univ, 2001.
- [9] A. Syakroni, C. Muali, and H. Baharun, "Motivation And Learning Outcomes Through The Internet Of Things ; Learning In Pesantren," *J. Phys. Conf. Ser.*, vol. 1363, pp. 1–5, 2019, doi: 10.1088/1742-6596/1363/1/012084.
- [10] M. I. Ulum, "Strategi Self-Regulated Learning untuk Menurunkan Tingkat Prokrastinasi Akademik Siswa," *Psymphatic J. Ilm. Psikol.*, vol. 3, no. 2, pp. 153–170, 2016, doi: 10.15575/psy.v3i2.1107.
- [11] P. Saraswati, "Self Regulated Learning Strategy, academic procrastination and academic achievement," *Intuisi*, vol. 9, no. 3, pp. 210–223, 2017.
- [12] B. J. Zimmerman, "A Social Cognitive View of Self-Regulated Academic Learning," *J. Educ. Psychol.*, vol. 81, no. 3, pp. 329–339, 1989, doi: 10.1037/0022-0663.81.3.329.
- [13] S. Islam *et al.*, "To Boost Students' Motivation and Achievement through Blended Learning," in *Journal of Physics: Conference Series*, 2018, vol. 1114, no. 1, pp. 1–11, doi: 10.1088/1742-6596/1114/1/012046.
- [14] F. W. Pratama, "Peran Self-Regulated Learning Dalam Memoderatori Pembelajaran Dengan Pendekatan Sainifik Terhadap Hasil Belajar Siswa," *Satya Widya*, vol. 33, no. 2, pp. 99–108, 2017, doi: 10.24246/j.sw.2017.v33.i2.p99-108.
- [15] M. Samsudin, N. Nyoman, and U. Januhari, "Pengembangan Pembelajaran E-learning Dengan Moodle ( Modulator Object-Oriented Dynamic Learning Environment )," *J.*

- Sist. dan Inform.*, vol. 14, no. 1, pp. 1–8, 2019, doi: 10.30864/jsi.v14i1.210.
- [16] G. Jati, “Learning Management System (Moodle) and E-learning Content development,” *J. Sosioteknologi*, vol. 28, no. 12, pp. 277–289, 2013.
- [17] S. H. Harahap, “Pemanfaatan E-Learning Berbasis LCMS Moodle Sebagai Media Pembelajaran Untuk Mata Kuliah Sistem Informasi Akuntansi,” *J. Ris. Akunt. dan Bisnis*, vol. 15, no. 1, pp. 86–99, 2015.
- [18] S. Rizal and B. Walidain, “Pembuatan Media Pembelajaran E-Learning Berbasis Moodle Pada Matakuliah Pengantar Aplikasi Komputer Universitas Serambi Mekkah,” *J. Ilm. Didakt.*, vol. 19, no. 2, pp. 178–192, 2019.
- [19] A. R. Hakim, “Pengembangan E-Learning Berbasis Moodle Sebagai Media Pengelolaan Pembelajaran,” *Kodifikasia*, vol. 12, no. 2, pp. 167–183, 2018.