**Perceptions of Electrical Engineering Students towards Moodle in Electrical Installation Courses in the New Normal Era**

**A Amri1 and S Soenarto2**

12Universitas Negeri Yogyakarta, Jl. Colombo no. 1 Karang Malang, Depok, Sleman, Yogyakarta, Indonesia

E-mail: arianiamri.2019@student.uny.ac.id

**Abstract.** Learning recently has changed due to technological advances, especially with the use of internet technology. E-learning is an example of internet-based learning to aim conveying information online. With the COVID-19 pandemic, e-learning is now urgently needed. Therefore, electronic media is needed as a learning media for students that takes place online. Moodle is one of the electronic media in the teaching and learning process, by having online discussion, students will cause various perceptions, so the study aimed to determine students' perceptions of electronic learning media (Moodle) on electrical installation courses in the new normal era. The study used a quantitative descriptive method with stratified random sampling. The total of 138 students majoring in electrical engineering education Universitas Negeri Makassar, from the 2016, 2017, and 2018 class. The results showed that: (1) Students' perceptions of implementation of electronic learning media (Moodle) on electrical installation courses is urgently needed in the new normal era, (2) Students' perceptions of the positive impact on electronic learning media (Moodle) on electrical installation courses, which can make it easier for students in the learning process because it can be used anywhere and anytime, (3) Students' perceptions of the negative impact on electronic learning media (Moodle) on electrical installation courses, which are very limited by internet connections.

1. **Introduction**

The development of information technology and computers (ICT) has expanded to all areas of human life, including in the education field. One of the characteristics in the development of ICT is utilizing the internet [12]. Advances in technology, especially ICT can change various aspects of human life, including learning [16]. Therefore the use of the internet must be increased as a learning media or educational media in Indonesia to increase innovation and skills in the field of Science and Technology (IPTEK) because technology plays an important role in higher education and the future of information technology (internet network) [1].

E-learning as the utilization of internet networks will support learning in the 21st century. E-learning is electronic-based learning that aims to create an integrated learning environment between humans and technology. Teaching and learning activities are highly influenced by the use of learning media and the possibility of students getting satisfaction in realizing services by using online learning media [15]. Previous studies have suggested that e-learning is an effective tool for improving the quality and standards of education [9].

E-learning media is web-based media and Moodle is one of its applications. Moodle has been chosen by teachers or lecturers as a learning resource as well as a media learning. Moodle can be used easily because it can be accessed anywhere free to design pages for certain learning. The development of teaching materials must adapt to the needs of students in the learning process [8]. In addition, Moodle can increase the effectiveness of student learning and learning experience, which is designed based on the pedagogical aspects of constructivism and beneficial in the long term [5]. In a previous study entitled "Factors Affecting the Effectiveness and Use of Moodle: Students' Perception", the results showed that 68.4% of students had a satisfactory effect on the moodle e-learning media system and offered findings on the factors that might increase the effectiveness of student learning [3,4]

Based on the observations, the effectiveness of the learning process has been shown in electrical installations learning previously. However, during the pandemic, students have difficulty learning electrical concepts thoroughly and listening to lecturers' explanations globally and briefly through the Zoom meeting application. Therefore, electrical installations learning needs a moodle to improve innovative learning during the Covid-19 pandemic so that learning could run effectively as before and be able to develop students' psychological and cognitive progress [11,13,18].

During the Covid-19 pandemic, the Moodle platform is the best option for online learning, because it can be used as a problem solving for student learning difficulties [11]. This also indirectly overcomes the spread of Covid-19 because it can implement physical distancing. By using electronic media during in new normal era, students are able to learn properly. The benefit of Indonesian education is it can be a benchmark in implementing learning to foster cooperation between students and being able to follow and use technology well even though they are in a Covid-19 pandemic situation. Therefore, the author wanted to investigate depthly the students' perceptions of the impact of using electronic media, Moodle in the electrical installation courses.

1. **Method**

The study used descriptive quantitative with survey methods. The quantitative research method is used to answer research problems related to data in the form of numbers and statistical programs. Data collection was carried out by distributing online questionnaires using Google Form to bachelor students of Electrical Engineering Education of Universitas Negeri Makassar (PTE UNY). The population amounted to 211 people which was 68 students from the 2016 class, 63 students from the 2017 class, and 80 people from the 2018 class. The sample used was random sampling. The data was analysed by using the formula from Yamane as fellow:

$$n=\frac{N}{1+N (e)²}$$

Note:

n = The total of required sample

N = The total of population

e = The sampling error (normally 5%)

$$n=\frac{N}{1+N (e)²}=\frac{211}{1+211 (0,05)²}=138$$

 The data was collected by four questionnaires about students' perceptions of the use of moodle in electrical installation courses and the positive as well as negative impacts which were arranged based on the adaptation and improvement of previous research [12]. Each item was a positive statement using a Likert scale which consisted of 4 scales, namely: 1) Strongly Agree (SA), 2) Agree (A), 3) Disagree (D), and 4) Strongly Disagree (SD). The first questionnaire consisted of 10 statements to measure students' knowledge of electrical installation courses and moodle. The second was about the first aspect which consisted of 10 positive statements that measure students' perceptions of the use of moodle in the electrical installation courses. Third, the second aspect consisted of 7 positive statements that measure students' perceptions of the positive impact on moodle use. The last questionnaire consisted of 6 positive statements measuring the negative impact of using a moodle.

1. **Results and Discussion**

The data which has been obtained was analysed using a determined method. Table 1 showed the data of students’ perception toward the knowledge in electrical installation courses and moodle.

**Table 1.** The students’ perception toward the knowledge in

electrical installation courses and moodle

|  |  |  |
| --- | --- | --- |
|  | Content | Percentage (%) |
| Yes | No |
| 1. | Have you studied electrical installation courses? | 100 | - |
| 2. | Did you have difficulty understanding electrical installation courses? | 51.1 | 48.9 |
| 3. | Do you know about electrical installation learning media? | 87.1 | 12.9 |
| 4. | Do you think that learning media is needed in electrical installation courses? | 98.6 | 1.4 |
| 5. | Do you think the existing learning media is enough to help you understand the electrical installation courses? | 48.9 | 51.1 |
| 6. | Do you know electronic learning media (Moodle)? | 59.7 | 40.3 |
| 7. | Do you think the existing learning media is in accordance with the current new normal situation? | 44.6 | 55.4 |
| 8. | Do you think electronic learning media (Moodle) is suitable for electrical installation courses? | 81.3 | 18.7 |
| 9. | Do you think electronic learning media (Moodle) is suitable for learning in the new normal era? | 82.7 | 17.3 |
| 10. | Do you think electronic learning media (Moodle) help you understand the electrical installation courses? | 84.9 | 15.1 |

Table 1 showed that 100% of students have studied the electrical installation courses, which means that all students already know the electrical installation courses. Almost all students also said that the electrical installation courses required learning media. Learning media was defined as "everything that can channel and convey messages thus creating a conducive learning environment where the recipient can carry out the learning process efficiently and effectively" [10]. The media can make it easier to understand electrical installation courses and can make students more qualified in learning. The existed media was not enough to help students understanding electrical installations in the new normal era because they were still conventional. Technological advances can innovate changes to conventional learning by utilizing electronic learning media. The use of electronic learning media will make students highly qualified by using it as desired and more advanced [2]. Moodle is an application that can be used for online learning and is suitable for this current condition. Covid-19 pandemic requires us to do physical distancing, so learning is currently carried out online, therefore the existence of media electronic learning is a need. Based on government regulations for conducting online learning, there is a need for measurements to determine students’ perceptions of electronic learning media or Moodle used in online electrical installation courses. Students’ perceptions generally can be seen in Table 2.

 **Tabel 2.** The results of general perseptions

|  |  |
| --- | --- |
| **The Aspects of Students’ Perceptions** | **Percentage (%)** |
| **SA** | **A** | **D** | **SD** |
| The utilization  | 24.2 | 54.3 | 17.8 | 4.1 |
| The positive impact | 29.6 | 58.8 | 9.4 | 2.3 |
| The negative impact | 21.2 | 43.3 | 29.7 | 11.1 |

Table 2 showed that 54.3% of students or the majority agree with the use of moodle in the electrical installation course. It can make the students discuss both between friends and lecturers easier even though they are not facing to face. The design of the electrical installation material is arranged using Moodle so that students can study independently. Electronic learning media can emphasize students in managing their learning so they can become independent to motivate themselves to achieve certain goals [7]. An innovative learning model is needed during the Covid-19 pandemic situation with the independent learning theory. Based on the media used, it showed that online learning was very supportive of students’ independence and good habits in learning [19]. This was following the theory of independent learning which emphasizes that students' ability and proactiveness in self-motivation and behavior to achieve goals will be a factor in independent learning [20]. Electronic learning media is uniquely made to keep all information or material structurally which can be accessed via the internet so that students can learn more effectively. Implementing the e-learning system greatly affects learning styles and makes the learning process easier for students and becomes more effective. It means that Moodle can replace the role of educators to explain material and function as a facilitator in the online learning process in the new normal era.

The use of Moodle in the new normal era can have both positive and negative impacts on its users. As shown in Table 2, the positive impact was bigger than the negative impact. Moodle can facilitate students in the learning process and make it easier to understand the electrical installation course properly. The electronic media is also able to make students more diligent in doing assignments, because of the time settings given by the lecturer for the assignment. Therefore, students can learn well even though it is online. Following previous research, learning using electronic media can improve teaching and not just show the desire of what is known but can realize international needs [6].

Electronic media invites students to be motivated to study independently, so that the material that has been prepared by the lecturer in the Moodle application can be understood properly. The material provided is very easy to access anywhere and anytime, indirectly the electronic learning media can make the electrical installation learning process effective and efficient. However, the use of technology also has a negative impact on its users because it is very dependent on the internet network so that students sometimes find it difficult to use Moodle when in areas with inadequate internet access. As previously stated, the main problem in the use of technology is the internet connection [17].

1. **Conclusion**

Online learning during the new normal era since the Covid-19 pandemic was carried out by government regulations that have been implemented by all Indonesian universities. Students' perceptions which was reviewd from three aspects were majority in the agree category. Students' perceptions of the use of electronic media using the Moodle application in the electrical installation courses got a percentage of 54.3%. Based on the same analysis, students also had a positive perception of Moodle with a percentage of 58.8%. This was caused by Moodle can help students interact with fellow students and lecturers even though they are studying online. Furthermore, students can access material that has been given by the lecturer on electronic learning media anywhere and anytime. However, students also had a negative perception of Moodle with a percentage of 43.3%, because it was very limited by the internet network, especially for certain areas.

 Students' perceptions towrad Moodle in the electrical installation courses are expected to be followed up by educators in the learning process. Further researchers should follow up on the results of studies on several schools or institute to conduct empirical tests on the implementation of instructional media.

**Acknowledgments**

We would like to thank students in the Electrical Engineering Education Department of UNM class 2016, 2017, and 2018 and other parties who have helped carry out the study from start to finish so that we can present this paper. Feedback, criticism, and suggestions are expected to improve this paper.

1. **References**

[1] A Eldeeb R 2014 *Students’ Perceptions to e-learning*. IOSR Journal of Research & Method in Education (IOSRJRME), 4(3), 33–36. <https://doi.org/10.9790/7388-04343336>

[2] Almarabeh T 2014 *Students’ perceptions of E-learning at the University of Jordan*. International Journal of Emerging Technologies in Learning, 9(3), 31–35. https://doi.org/10.3991/ijet.v9i3.3347

[3] Damnjanovic V Jednak S & Mijatovic I 2015 *Factors affecting the effectiveness and use of Moodle: students’ perception. Interactive Learning Environments*, 23(4), 496–514. https://doi.org/10.1080/10494820.2013.789062

[4] Dziuban C Graham C Rmoskal P D Norberg A & Sicilia N 2018. *Blended learning: the new normal and emerging technologies*. International Journal of Educational Technology in Higher Education, 15(1), 1–16. https://doi.org/10.1186/s41239-017-0087-5

[5] Gunduz N & Ozcan D 2017 *Implementation of the Moodle System Into EFL Classes. Profile: Issues in Teachers´ Professional Development*, 19(\_sup1), 51–64. https://doi.org/10.15446/profile.v19n\_sup1.68571

[6] Kerimbayev N Kultan J Abdykarimova S & Akramova A 2017. *LMS Moodle: Distance international education in cooperation of higher education institutions of different countries*. Education and Information Technologies, 22(5), 2125–2139. https://doi.org/10.1007/s10639-016-9534-5

[7] Mandusic D & Blaskovic L 2015 *The impact of collaborative learning to critically thinking*. Trakia Journal of Science, 13(Suppl.1), 426–428. https://doi.org/10.15547/tjs.2015.s.01.073

[8] Maryadi T H T Sukisno T Chandra A N & Atmoko A W 2019 *Augmented Reality-Based Instructional Media for Electrical Power Protection Learning*. Journal of Physics: Conference Series, 1387(1). https://doi.org/10.1088/1742-6596/1387/1/012015

[9] Mirza A A & Al-Abdulkareem M 2011 *Models of e-learning adopted in the Middle East*. Applied Computing and Informatics, 9(2), 83–93. <https://doi.org/10.1016/j.aci.2011.05.001>

[10] Munadi Yudhi 2010 *Media Pembelajaran “Sebuah Pendekatan Baru”*. Jakarta: Gaung Persada Press.

[11] Nasrun A Alim A H Rahmayanti H Husen A & Ichsan I Z 2020 *Environmental Disaster Education at University : An Overview in New Normal of COVID-19*. 2(8), 714–719.

[12] Nofriansyah D Ganefri & Ridwan 2020 *A new learning model of software engineering in vocational education.* International Journal of Evaluation and Research in Education, 9(3), 572–582. https://doi.org/10.11591/ijere.v9i3.20482

[13] Noor M 2017 *Interactive Media Apps and Talk learning approach; Learners psychological and cognitive development.* ICICTM 2016 - Proceedings of the 1st International Conference on Information and Communication Technology, May 2016, 209–214. https://doi.org/10.1109/ICICTM.2016.7890802

[14] Paramadina A T 2012 *Pembelajaran Online Scele Pada Mahasiswa Reguler Fik UI.*

[15] Putri M P & Solfema S 2019 *The Relationship Between Variations in the Use of Learning Media and the Learning Activity of Citizens Learning.* Indonesian Journal of Contemporary Education, 1(1), 36–40. http://journal.iiesindependent.org/index.php/ijce/article/view/25/20

[16] Sengkey D F Paturusi S D E Sambul A M & Gozali C T 2019 *A Survey on Students’ Interests toward On-line Learning Media Choices (A Case Study from the Operations Research Course in the Department of Electrical Engineering, UNSRAT).* International Journal for Educational and Vocational Studies, 1(2), 146–152. https://doi.org/10.29103/ijevs.v1i2.1527

[17] Simamora R M 2020 *The Challenges of Online Learning during the COVID-19 Pandemic: An Essay Analysis of Performing Arts Education Students*. Studies in Learning and Teaching, 1(2), 86–103. https://doi.org/10.46627/silet.v1i2.38

[18] Sintema E J 2020 *Effect of COVID-19 on the performance of grade 12 students: Implications for STEM education.* Eurasia Journal of Mathematics, Science and Technology Education, 16(7), 1–6. https://doi.org/10.29333/EJMSTE/7893

[19] Wargadinata W Maimunah I Dewi E & Rofiq Z 2020 *Student’s Responses on Learning in the Early COVID-19 Pandemic*. Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah, 5(1), 141–153. https://doi.org/10.24042/tadris.v5i1.6153

[20] Zimmerman B J 2015 *Motivational Sources and Outcomes of Self-Regulated Learning and Performance.* Handbook of Self-Regulation of Learning and Performance, 11237. https://doi.org/10.4324/9780203839010.ch4