

Use of Blended Learning with Moodle: Study Effectiveness in Elementary School Teacher Education Students during The COVID-19 pandemic

Reza Rachmadtullah^{1*}, Marianus Subandowo², Rasmitadila^{3*},
Megan Asri Humaira⁴, Rusi Rusmiati Aliyyah⁵, Achmad Samsudin⁶,
Muhammad Nurtanto⁷

^{1,2}Universitas PGRI Adi Buana, Surabaya, Indonesia

^{3,4,5}Universitas Djuanda, Bogor, Indonesia

⁶Universitas Pendidikan Indonesia, Bandung, Indonesia

⁷Universitas Sultan Ageng Tirtayasa, Indonesia

Abstract

Currently, various countries in the world, are shocked by an outbreak of a disease caused by a virus called corona or better known as COVID-19 (Corona Virus Diseases-19). As a result of the COVID-19 pandemic, leading to the implementation of various policies to break the chain of the spread of the COVID-19 virus in Indonesia. One of the efforts made by the government in Indonesia is to implement an appeal to the public to carry out physical distancing, one of which is in the field of Education where the learning process is done online at home. This study aims to find out how effectively the use of the blended-learning learning model with moodle applications in Elementary School Teacher Education students during the COVID-19 pandemic. This type of research is a quasi-experimental design with a pretest-posttest control group. The results of this study indicate that the use of the moodle blended-learning learning model in Elementary School Teacher Education students during the COVID-19 pandemic period is effective and can be used as a network-based learning solution or online.

Keywords: Blended learning, Moodle, Elementary School Teacher Education

1. Introduction

As long as the COVID-19 outbreak is still ongoing and there are no signs of abating, all activities are generally carried out at home through online systems. No exception education that was affected by the COVID-19 epidemic [1], [2]. By using an online system, students continue to learn and hone academic and non-academic abilities. Supported by the creative work of teachers, students still get the right education even within space constraints. Teachers' creativity in presenting learning activities [3], [4] continues to support the development and stimulate student intelligence. Like giving assignments in accordance with the learning theme that was originally designed. This is due to technological advances so that it becomes an alternative to face this outbreak.

The quick improvement of communication and data innovation has changed the learning models and designs within the world of education. One advancement within the learning prepare is the blended-learning strategy [5], [6]. The Utilization of moodle as a getting to know tool serves as a method to enforce online gaining knowledge of systems, specifically at some point of this pandemic COVID-19 outbreak. Initially, the time period Blended getting to know became used to describe studying that tried to mix face-to-face getting to know with online mastering. The concept of the blended learning model began to develop with the existence of several expert opinions which developed and defined the Blended learning model [7]. According to Fitzpatrick, Blended learning is a combination of online-based mastering with face-to-face mastering in the classroom (conventional)[7]. Blended learning is an effective mixture with diverse shipping models, teaching models, and studying patterns that may be completed in an interactive learning environment on online getting to know (e-Learning) and face-to-face gaining knowledge of. So this model can be carried out to any subject [8], [9].

The Moodle (brief for Secluded Object-Oriented Energetic Learning Environment) could be a program bundle created for internet-based learning exercises and websites that utilize social constructionist instructional method standards. Is an open-source computer program that can be utilized as a Learning Management Framework (LMS) or Course Management System (CMS)? For

example, a speaker needs to make an internet location so understudies can download course fabric, exam fabric, tests, etc. on the location. At that point, he can utilize Moodle as his computer program [10], [11].

Moodle is a Learning Management System (LMS) that is open source, and can be obtained free of charge under the GNU license. Because of its open source nature, Moodle can be developed according to the needs of users. Moodle is very user-friendly when compared to other LMS and has been used by various groups, not only the world of formal education, non-profit organizations, and private companies also have many uses. Moodle is also easy to develop with good security and administration support. By using Moodle, a teacher can create a learning environment where the instructor can provide material, provide a place to collect assignments, carry out quizzes, and various other activities carried out online [12], [11].

Research studies on blended learning with Moodle have been done a lot. One of the studies conducted [13] stated that the use of blended learning with moodle applications proved to be effective in improving the quality of students' learning achievement. and blended learning with moodle applications can increase students' motivation and interest in learning. Other researchers conducted by Teresa Martin-Blas and Ana Serrano Fernandez [14] stated that the students' response to this initiative changed into very good, this online physics elegance helped them to reinforce their abilities and knowledge. Because in Moodle we can share knowledge through various types of activities that can be monitored, such as forums and chat. So, So, it could be concluded that this Moodle media can improve learning outcomes and assist students understand the lesson. Based at the relevant research, the research is more targeted on the effectiveness of using blended studying with Moodle during a virus COVID-19. This research is expected to provide advice in order to be able to use the learning model of blended learning with Moodle.

2. Method

2.1. Research design

This study aims to find out how effectively the use of the blended learning model with moodle applications to Elementary School Teacher Education students during the Covid-19 pandemic. This study uses a quasi-experimental type with the pretest-posttest control group design. Pretest-posttest control group design is a research design consisting of two randomly selected groups, then in this study were given a pre-test pretest and posttest after learning that serves to determine whether there are differences between the control group and the experimental group. In the experimental group, classes were treated using LMS-based blended learning with moodle, while the control class used non-learning learning methods. The results of the pre-test and post-test scores in the experimental and control classes are compared so that the comparative values can be found

2.2. Respondents

Respondents in this study are semester students who have used blended learning in learning activities, the sampling technique used in this study was purposive sampling technique. Purposive sampling or sample aiming is the technique of determining the sample with certain considerations. The reason for using purposive sampling technique is because two classes are needed which are homogeneous in their ability and can represent population characteristics. The selected sample is 30 student respondents.

2.3. Instrument

The instrument used in this study was a blended learning tool with the next Moodle, namely the blended learning device used was a semester learning plan, student worksheets about exercises, handouts and online learning classes.

2.4. Data analysis

Data collection techniques in this study were obtained by holding a treatment called pretest and posttest. Pretest is used to measure students' initial abilities before learning begins and posttest treatment is used to measure students' abilities after learning using blended learning with the complete moodle application. These pretest and posttest are given to the control class and the experimental class. Then the average difference test on the initial achievement of each experimental group was

performed. This is done aims to determine whether there is a comparison of the average value for the initial achievement of the two groups. The test used is the independent sample t-test with a significance level of 0.05 on the SPSS 24.00 software..

3. Results

The results of the analysis in this study were to find out how effective the use of blended learning models using Moodle in Elementary School Teacher Education students during the COVID-19 pandemic. As can be explained as follows:

Table 1. Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	74.40	30	5.500	1.004
Postets	86.40	30	5.269	.962

Based on Table 1 shows the average value before using blended learning with Moodle 74.40 and after being given treatment by using blended learning with Moodle increased that is getting an average value of 86.40. based on the results that have been obtained are descriptive there is a value of the common difference earlier than and after the software of the usage of the mastering version of blended learning with moodle applications to Elementary School Teacher Education students during the Covid-19 pandemic. For more detailed comparisons, you can see in the graph below:

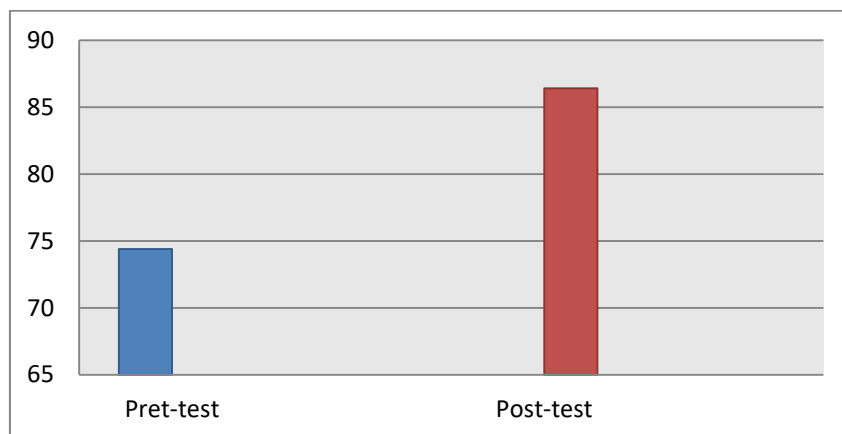


Figure 1. a comparison between pretest and posttest

Table 2. Paired Samples Correlations

	N	Correlation	Sig.
Pretest & Posttest	30	.199	.292

In Table 2, the correlation coefficient obtained by the analysis of the learning model of blended learning using Moodle in Elementary School Teacher Education students during the COVID-19 pandemic before and after being dealt with the usage of the blended getting to know model using Moodle in Primary School Teacher Education students during the pandemic COVID-19 of 199 with sig, or p-value = 0.292 \geq 0.05 or not significant.

Table 3. Paired Samples Test

Paired Differences				t	df	Sig. (2-tailed)
Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			

			Lower	Upper			
-12.000	6.818	1.245	-14.546	-9.454	-9.640	29	.000

In Table 3, the mean difference = -12,000 is obtained, which means that the score difference between the results of the blended learning model using Moodle on Elementary School Teacher Education students during the COVID-19 pandemic. Basis during the COVID-19 pandemic Prices are higher than before being treated. Furthermore, in this desk also received the suggest error general which shows the usual error charge of the average difference. Furthermore, the foremost important end result of this desk is the measurable price of $t = -9,640$ with $df\ 39$ and important figures or the p -value $0,000 < 0.05$ or H_0 is rejected. Hence, it is able to be concluded that there are critical contrasts incomes about between some time recently utilizing the blended-learning show utilizing Moodle in elelemntary School Educator Instruction understudies amid the COVID-19 pandemic.

4. Discussion

Applying the right Blended learning model can facilitate educators and students in the process of understanding several disciplines that make it possible by optimizing teaching and learning that is more flexible by utilizing technology [15]. Blended learning may be a smart solution to triumph over issues within the mastering process [16]. According to [17],[18] from several existing studies stated that if the blended learning model was applied to the learning process it would be more effective with the transition of students to higher levels in gaining knowledge and developing skills [16], [19]. In its implementation blended learning is indeed flexible but there are many things that have to be considered so that learning can run efficiently and beneficial [20]. The factors which can be combined in the studying sports of the blended mastering version do not only integrate face-to-face and online learning, but can also take any form, such as: methods, media, resources, environment or gaining knowledge of techniques that vary, the main factors of facilitating distance studying. [21].

Blended learning illustrates an opportunity that integrates innovation and the benefits of technology in online learning with the interaction and participation of the benefits of face-to-face learning [22], [23]. Meanwhile, [3] explained blended learning as learning that mixes synchronous and asynchronous gaining knowledge of settings precisely so as to achieve getting to know objectives. Synchronous learning is mastering activities performed at the equal time and in the same or different places, while asynchronous learning is learning activities carried out at different times and places [24], [25]. The aspects that are combined in blended learning not best combine face-to-face and online learning, but can also take any form, such as: methods, media, resources, environment or learning strategies [26], [27], [28], [29], [30], [31]. online learning offers all facilities with the delivered comfort of a learning experience tailored for your schedule. With courses available in almost every subject, and flexible schedule to healthy almost each lifestyle, students an increasing number of turn to online mastering as a viable opportunity to have a look at on campus.

6. Reference

- [1] TIMESINDONESIA, 'Online Learning in the Middle of the COVID-19 Pandemic, the Challenges that Matured', *TIMESINDONESIA*, (2020). <https://www.timesindonesia.co.id/read/news/261667/pembelajaran-online-di-tengah-pandemi-COVID19-tantangan-yang-mendewasakan>.
- [2] BBC Indonesia, 'Virus corona: Tak semua pengajar, siswa siap terapkan "sekolah di rumah"', (2020). <https://www.bbc.com/indonesia/indonesia-51906763>.
- [3] M. Nurtanto, D. Widjanarko, H. Sofyan, Rabiman, and M. B. Triyono, 'Learning By Creating: Transforming Automotive Electrical Textual Material Into Visual Animation As A Creative Learning Products (CLP)', *Int. J. Sci. Technol. Res.*, vol. 8, no. 10, (2019), pp. 1634–1642, Accessed: Mar. 13, 2020. [Online]. Available: <http://www.ijstr.org/paper-references.php?ref=IJSTR-1019-22932>.
- [4] R. Rabiman, M. Nurtanto, and N. Kholifah, 'Design And Development E-Learning System By Learning Management System (LMS) In Vocational Education', vol. 9, no. 01, p. 5, (2020).

- [5] R. Rasmitadila, W. Widyasari, M. A. Humaira, A. R. S. Tambunan, R. Rachmadtullah, and A. Samsudin, 'Using Blended Learning Approach (BLA) in Inclusive Education Course: A Study Investigating Teacher Students' Perception', *Int. J. Emerg. Technol. Learn. IJET*, vol. 15, no. 02, p. 72, (2020), doi: 10.3991/ijet.v15i02.9285.
- [6] M. Asri Humaira, Rasmitadila, Widyasari, R. Rachmadtullah, and D. Kardaya, 'Using blended learning model (BLM) in the instructional process: teacher student perception's', *J. Phys. Conf. Ser.*, vol. 1175, p. 012213, (2019), doi: 10.1088/1742-6596/1175/1/012213.
- [7] Widyasari, Rasmitadila, M. Asri Humaira, R. Rusmiati Aliyyah, A. Abdul Gaffar, and R. Rachmadtullah, 'Preliminary study on the development of blended learning (BLM) model: based on needs analysis and learning independence', *J. Phys. Conf. Ser.*, vol. 1175, p. 012207, (2019), doi: 10.1088/1742-6596/1175/1/012207.
- [8] J. C. Evans, H. Yip, K. Chan, C. Armatas, and A. Tse, 'Blended learning in higher education: professional development in a Hong Kong university', *High. Educ. Res. Dev.*, (2019), pp. 1–14, doi: 10.1080/07294360.2019.1685943.
- [9] B. Bervell and I. N. Umar, 'Blended learning or face-to-face? Does Tutor anxiety prevent the adoption of Learning Management Systems for distance education in Ghana?', *Open Learn. J. Open Distance E-Learn.*, (2018), pp. 1–19, doi: 10.1080/02680513.2018.1548964.
- [10] A. Al-Ajlan and H. Zedan, 'Why Moodle', in *2008 12th IEEE International Workshop on Future Trends of Distributed Computing Systems*, (2008), pp. 58–64, doi: 10.1109/FTDCS.2008.22.
- [11] Moodle, 'Moodle: Online Learning with the World's Most Popular LMS'. moodle.com.
- [12] R. Rabiman, M. Nurtanto, and N. Kholifah, 'Design And Development E-Learning System By Learning Management System (LMS) In Vocational Education', vol. 9, no. 01, p. 6, (2020).
- [13] W. T. Al-Ani, 'Blended Learning Approach Using Moodle and Student's Achievement at Sultan Qaboos University in Oman', *J. Educ. Learn.*, vol. 2, no. 3, (2013), doi: 10.5539/jel.v2n3p96.
- [14] T. Martín-Blas and A. Serrano-Fernández, 'The role of new technologies in the learning process: Moodle as a teaching tool in Physics', *Comput. Educ.*, vol. 52, no. 1, (2009), pp. 35–44, doi: 10.1016/j.compedu.2008.06.005.
- [15] Dr. Rasmitadila, Dr. Widyasari, T. Prasetyo, R. Rachmadtullah, A. Samsudin, and A. Riana Suryanti Tambunan, 'Design of Instructional Strategy Model Based on the Brain's Natural Learning System (MS-SiPAO) in Inclusive Classrooms in Higher Education', *Univers. J. Educ. Res.*, vol. 7, no. 11, (2019), pp. 2352–2360, doi: 10.13189/ujer.2019.071113.
- [16] M. Nurtanto, H. Sofyan, M. Fawaid, and R. Rabiman, 'Problem-Based Learning (PBL) in Industry 4.0: Improving Learning Quality through Character-Based Literacy Learning and Life Career Skill (LL-LCS)', *Univers. J. Educ. Res.*, vol. 7, no. 11, (2019), pp. 2487–2494, doi: 10.13189/ujer.2019.071128.
- [17] M. J. Kintu, C. Zhu, and E. Kagambe, 'Blended learning effectiveness: the relationship between student characteristics, design features and outcomes', *Int. J. Educ. Technol. High. Educ.*, vol. 14, no. 1, p. 7, (2017), doi: 10.1186/s41239-017-0043-4.
- [18] A. V. Kudryashova, T. N. Gorbatoeva, and N. E. Rozhkova, 'Developing a blended learning based model for teaching foreign languages in engineering institutions', *SHS Web Conf.*, vol. 28, p. 01128, (2016), doi: 10.1051/shsconf/20162801128.
- [19] M. Nurtanto, P. Pardjono, Widarto -, and S. D. Ramdani, 'The Effect of STEM-EDP in Professional Learning on Automotive Engineering Competence in Vocational High School', *J. Educ. Gift. Young Sci.*, vol. 8, no. 2, (2020), pp. 633–656, Accessed: Mar. 18, 2020. [Online]. Available: <https://dergipark.org.tr/en/pub/jegys/645047>.
- [20] R. Boelens, M. Voet, and B. De Wever, 'The design of blended learning in response to student diversity in higher education: Instructors' views and use of differentiated instruction in blended learning', *Comput. Educ.*, vol. 120, (2018), pp. 197–212, May 2018, doi: 10.1016/j.compedu.2018.02.009.
- [21] J. Wong, M. Baars, D. Davis, T. Van Der Zee, G.-J. Houben, and F. Paas, 'Supporting Self-Regulated Learning in Online Learning Environments and MOOCs: A Systematic Review', *Int. J. Human-Computer Interact.*, vol. 35, no. 4–5, (2019), pp. 356–373, doi: 10.1080/10447318.2018.1543084.

- [22] A. Bokolo *et al.*, 'A managerial perspective on institutions' administration readiness to diffuse blended learning in higher education: Concept and evidence', *J. Res. Technol. Educ.*, vol. 52, no. 1, (2020), pp. 37–64, doi: 10.1080/15391523.2019.1675203.
- [23] Z. Arifin, M. Nurtanto, W. Warju, R. Rabiman, and N. Kholifah, 'The TAWOCK Conceptual Model for Content Knowledge for Professional Teaching in Vocational Education', *Int. J. Eval. Res. Educ. IJERE*, vol. 9, no. 3, (2020), doi: 10.11591/ijere.v9i3.20561.
- [24] I. blended learning: a case based sharing Experience, 'Implementing blended learning: a case based sharing experience', (2011).
- [25] A. Littlejohn and C. Pegler, *Preparing for blended e-learning*. Routledge, (2017).
- [26] M. C. Borba, P. Askar, J. Engelbrecht, G. Gadanidis, S. Llinares, and M. S. Aguilar, 'Blended learning, e-learning and mobile learning in mathematics education', *ZDM*, vol. 48, no. 5, (2016), pp. 589–610, doi: 10.1007/s11858-016-0798-4.
- [27] H. EL-Deghaidy and A. Nouby, 'Effectiveness of a blended e-learning cooperative approach in an Egyptian teacher education programme', *Comput. Educ.*, vol. 51, no. 3, (2008), pp. 988–1006, doi: 10.1016/j.compedu.2007.10.001.
- [28] A. Al-Azawei, P. Parslow, and K. Lundqvist, 'Investigating the effect of learning styles in a blended e-learning system: An extension of the technology acceptance model (TAM)', *Australas. J. Educ. Technol.*, (2016), doi: 10.14742/ajet.2741.
- [29] V. Munro *et al.*, 'E-learning for self-management support: introducing blended learning for graduate students – a cohort study', *BMC Med. Educ.*, vol. 18, no. 1, p. 219, (2018), doi: 10.1186/s12909-018-1328-6.
- [30] R. Rachmadtullah, M. Zulela, and M. Syarif Sumantri, 'Computer-based interactive multimedia: a study on the effectiveness of integrative thematic learning in elementary schools', *J. Phys. Conf. Ser.*, vol. 1175, p. 012028, (2019), doi: 10.1088/1742-6596/1175/1/012028.
- [31] R. Rachmadtullah, Z. Ms, and M. S. Sumantri, 'Development of computer - based interactive multimedia : study on learning in elementary education', *Int. J. Eng. Technol.*, vol. 7, no. 4, (2018), pp. 2035–2038, doi: 10.14419/ijet.v7i4.16384.