

The Implementation of E-learning Based Edmodo in Linear Algebra

Amalina^a, Jhoni Warmansyah^b, Email: ^{a*}malina@uinib.ac.id,
^bjhoniwarmansyah@iainbatusangkar.ac.id

This study discusses the implementation of e-learning based Edmodo in Linear Algebra in Tadris Mathematics, UIN Imam Bonjol Padang. A quantitative approach is used. The type of research is quasi-experimental with a randomised control group in post-test design, this is to provide treatment to the experimental group using e-learning-based Edmodo, while the control group is not given treatments (conventional learning). The population of this study was all students in Tadris mathematics who take linear algebra. The study sample consisted of two classes, namely, Class A as the experimental group and Class B as the control group. The method of data collection was done by the test essay method. The obtained data is analysed in two phases, namely, descriptive statistical analysis and inferential statistical analysis (t-test). Based on the results of the data analysis the t count = 3.857 > t table = 1.995 and the test data-T sig (2-tailed) is smaller than $\alpha = 0.05$ ($0.000 < 0.05$) so, H_a = Received and H_o = Rejected. This means there is a significant difference in the learning outcome students in linear algebra subjects between the experimental groups using e-learning based Edmodo, with the control group using conventional learning. Based on the explanation above, it can be concluded that e-learning based Edmodo influences the linear algebra learning outcomes of students in Tadris mathematics, UIN Imam Bonjol Padang. This research can be continued to identify the use of Edmodo in improving student critical thinking.

Key words: *E-Learning, Edmodo, Linear Algebra, Learning Outcomes.*

Introduction

Learning is an essential factor in achieving educational objectives, not only as a quality improvement undertaking that focuses on the past and present, but as a process that participates in the improvement of quality of education in a progressive future (Hendratmoko et al., 2018).

In its development, lately, the education system has been presented with new challenges in the era of the 4.0 industrial revolution with educational inputs, especially higher education, and with generation Z with all-digital activities. In this era, information can be accessed very easily and quickly without limited time and place, through a smartphone or smartphone and laptop device with the support of an internet connection. Rapid development in the field of information and communication technology is based on the development of mathematics in number theory, algebra, opportunity theory, and discrete mathematics that parallels the advancement of science and technology (Raharjo & Sulaiman, 2017).

Facing the 4.0 industrial era where young generations are presented with a period of digitalisation that facilitates the access of information openly and broadly, then actively learning activities in college must be adjusted to accommodate the needs of students who grow in the millennial times. So that the rise of social media use in this era gives new challenges in the world of learning to create a learning process that is close to the activities of students on social media.

The development of Science and Technology (IPTEK) can be utilised in the educational world, especially in transforming the learning systems in conventional classes. This can be done by using information and communication technology (ICT) in the form of computer media with the internet (Kholifah & Buditjahjanto, 2016). The presence of information technology can stimulate brain performance and make learners learn independently without the presence of teachers, in the learning space that causes the emergence of e-learning (Yazdi et al., 2012). The nature of the Internet is that it can be utilised at any time, students can access it according to their leisure so that the constraints of space and time they encounter to find learning resources can be addressed (Trisniawati et al., 2018).

Using different types of e-learning will enable learners, because it forces students to be more involved in participating in learning activities. This is because in e-learning students must have initiative and seek to find their own materials (Azizah et al., 2016). The use of learning media in the teaching process can generate new interests and desires, inspire motivation and stimulation of learning activities, and have psychological influences on learners (Tafonao, 2018). E-learning is an important advancement in the modern education system and advances the influence of transformation of conventional education into digital forms. This occurs both in contents and in its system. E-learning offers ways to learn using electronic media that makes learning more attractive, effective, and efficient (Hatip, A., & Listiana, 2019).

Linear algebra is one of the subjects that students must learn before taking advanced mathematical subjects. In this subject students are required to have a carefulness and thoroughness in their thinking. This subject is one of the most feared of students (Fitria et al., 2014). In the implementation of the mathematical curriculum, algebra becomes the subject that

gets special attention widely, as the most difficult, more so than other mathematical subjects. Students are required to understand and master the concept of linear algebraic matter to achieve the expected learning achievement. However, the reality is linear algebra is not mastered by students (Jupri et al., 2014).

This is in line with research results (Mawardi et al., n.d.), that the difficulties found when learning algebraic consists of the students proving the problem, and their weakness in understanding the concept and thoroughness of completing the elementary line operation, with the elimination method of Gauss Jordan. Dwi et al (2017), found that students did not complete linear algebra subjects and this was measured using mathematical understanding ability tests (TKPM).

Based on observations on the classes of linear algebra subjects in Tadris Mathematics, UIN Imam Bonjol Padang, a majority of students have not been able to relate concepts contained in interrelated material between concepts of newly studied material. This requires the lecturer to remind the students to return to the old material , which is time-consuming. Another problem found in the heterogeneities of the students 'was the ability to understand the lesson. This meant the lecturer needed to think about what strategies to apply to accommodate the ability of different students.

The utilisation of technologies such as computers and other multimedia tools is limited to certain subjects. The limited source of teaching materials and the provision of teaching materials in the form of print modules to students can only be done face-to-face, and learning processes are limited by time impacting the declining quantity and quality of student learning such as students ' low learning outcomes. Based on the problem, it is necessary to innovate learning strategy by utilising e-learning based Edmodo into the process of linear algebra learning.

A transformation module was used in the form of print to non-printing (online) through utilising e-learning, using an Edmodo application as a media that can support the process of teaching activities (Wiyoko et al., 2019). Edmodo is chosen because it is less known and less used, despite providing a safer and easier platform than popular social networks, such as Facebook (Thongmak, 2013). When compared to other social media learning management systems, Edmodo has the accessible advantage of closed group collaboration, and only those with a group code can take classes, that are free, accessible online, available for smartphones, Android devices, and iPhones, and do not require a server at school Thus they can be accessed anywhere and anytime.

Al-said (2015) found that using Edmodo in the learning process by educators can save much time and from a lot of challenges, and potential in leveraging in learning. Other research results

(Hanifah et al., 2019), discovered that the e-learning model of media assisted learning and Edmodo influenced the mathematical problem-solving skills of learners.

The use of e-learning with the social network Edmodo has a potential effect on student learning outcomes (Yunita, 2016). There is a difference in motivation and learning performance between the Edmodo-based classes and those not Edmodo-based (Rahmawati, 2019). Similar results are expressed by (Kusuma et al., 2016), who found there are significant differences in learning outcomes after the implementation of e-learning based Edmodo to students' mathematical literacy skills on realistic learning. (Rahmadika, 2014), states that the use of Edmodo brought improved cognitive learning outcomes for students, and Wirda et al (2018), concluded that the increased learning outcomes using the influential Edmodo-based e learning media amounted to 6.97% of student learning outcomes.

This study attempts to prove that through the use of online learning media, Edmodo can improve student learning outcomes in linear algebra subjects.

Methods

This research uses quantitative approaches with research types of quasi-experiment. The design model in this study is a randomised control group post test only design that provides treatment to the experimental group using e-learning based Edmodo, and the control group is not given treatment (conventional learning). Then both groups will be given the same evaluation (final Test). In the experimental design the groups are chosen randomly. The research plan can be seen in Table 1.

Table 1: Research design randomised control group posttest only design

R	X	O1
R	-	O2

Source: (Sugiyono, 2017)

Description:

R = Random

O1 = *Post-test* Experimental group

O2 = *Post-test* Control group

X = Treatment (E-learning based Edmodo)

This study was held in odd semester 2019/2020 in mathematics Tadris Program UIN Imam Bonjol Padang. The population in the study is all students who took the subject of linear algebra and have followed the subjects of calculus, which is a prerequisite for linear algebra. Sample withdrawal using a simple random sampling technique is used to see if the data is normal

distribution, homogeneous, and has an average similarity. This is done by looking at the value data of the semester final exam on the subject of calculus as the prerequisite of linear algebra. This is done using equality tests analysed by a one-way ANOVA test.

Based on the results of the equality test using SPSS 23.0 the significant value gained in both sample groups was more than 0.05, so it can be said that the population in this study is distributed as normal, homogeneous, and has equal academic capabilities. Subsequently selected samples with a simple random sampling technique. Class A was selected as an experimental group amounting to 35 students and class B as a control group amounting to 36 students. The experimental group was taught using Edmodo, while the control group assessments were taught using conventional learning.

Data collection techniques in the form of tests and documentation collection were undertaken. Expert judgment is used to see the validity of this research instrument. The stages of validity through the three phases include (a) Researchers provide the research instruments that have been designed and a validation sheet to the validator, (b) The validator validates the content of the test instrument, and (c) If the judgment result of the specified validator is valid then the instrument has fulfilled the content validation, and the instrument can be said to be valid if the assessment indicator is fulfilled. The data analysis technique used to test the hypothesis was done with the Independent sample T-test. The test started with prerequisite analysis, which is test data distribution normality and homogeneity test, interpretation of significant value using SPSS software program version 23.00. If the sign value is obtained less than the real level with $\alpha = 0.05$ then the H_0 Null hypothesis is rejected and the H_a hypothesis alternative is received.

Results and Discussion

The study intends to answer whether student learning outcomes taught by implementing e-learning based Edmodo is higher than the student learning outcomes taught by conventional methods in linear algebraic subjects. Student learning results can be seen from the final test scores on both sample groups after seven meetings. This test was done by 35 students of the experimental group and 36 students of the control group. Final test data is further analysed. The results can be seen in Table 2.

Table 2: The results of the descriptive statistical analysis of the experimental and control groups

Groups	Number of students	Mean	Median	Mode	Variance
Experimental group	35	71.43	72	75	75.49
Control group	36	62.97	62	50	94.89

Student learning outcomes of the experimental group can be seen on the Histogram in Figure 1.

Figure 1. Histograms of the result of experimental group learning

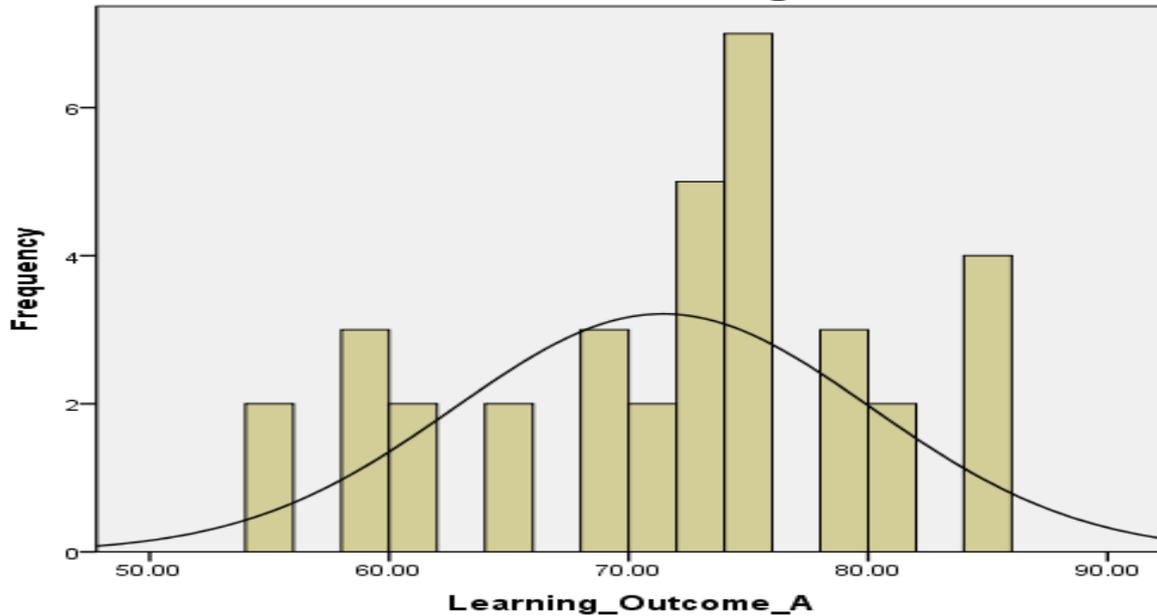
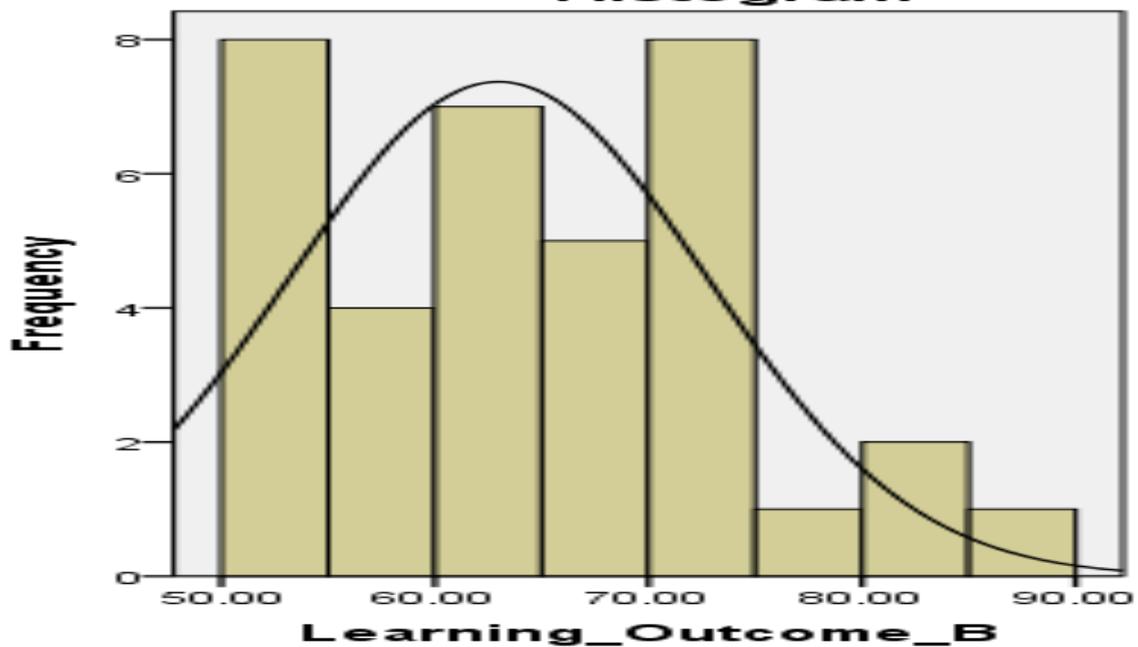


Figure 1 shows the distribution of learning outcomes for students of the experimental group is negative because of $\text{Mode} > \text{Median} > \text{Mean}$ ($75 > 72 > 71,43$). This indicates that most student group grades taught with e-learning based Edmodo tend to be high. In contrast to the learning data obtained through the post-test in the control group, it can be seen in the form of histograms in Figure 2.

Figure 2. Histograms of control group learning outcomes



The distribution of the control group data seen in Figure 2 indicates the conventionally taught student learning outcomes are positive because the data shows Mean > Median > Mode (62.97 > 62 > 50). This suggests that most of the student's scores, taught with the conventional learning method tend to be low.

Before testing the research hypothesis, the prerequisites that must be met are in the data, of the learning outcomes students' scores in linear algebra subject. Each sample group is normally distributed and homogeneous. The normality test uses Kolmogorov-Smirnov and Shapiro-Wilk, and the homogeneity test uses Levene Statistics using SPSS software. Based on the results the calculations obtained show significant value in both groups of samples, more than 0.05. The test of normality and homogeneity using SPSS 23.0 is shown in Table 3 and Table 4.

Table 3: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
A (Experimental Group)	.137	35	.092	.940	35	.057
B (Control Group)	.127	36	.154	.941	36	.053

a. Lilliefors Significance Correction

Table 4: Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.870	1	69	.354

Table 3 shows the sig value of the experimental group and the control group is greater than 0.05. Table 4 shows the sig value is 0.354 > 0.05. This means that student learning outcomes on linear algebra subjects of two groups samples, are normally distributed and homogeneous. The analysis was continued by testing the hypothesis with the t-test.

The t-test formula used is pooled variance, because the number of samples of the two groups is not the same. The test criteria is H0 rejected if t count > t table and H1 is rejected if t count < t table, with t table obtained from the distribution table t at a significance level of 5% with degrees of freedom $df = n_1 + n_2 - 2$. Based on the results of the t-test analysis t count = 3.857 and t table = 1.995 for $df = 69$ at the significance level of 5%. The results of these calculations indicate that t count > t table (3.857 > 1.995) so that H0 is rejected and H1 is accepted. This research also used SPSS for testing the hypothesis which is shown in Table 5.

Table 5: Hypothesis Test (Independent Samples Test)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Outcomes	Equal variances assumed	.870	.354	-3.857	69	.000	-8.456	2.193	-12.831	-4.082
	Equal variances not assumed			-3.863	68.5	.000	-8.456	2.189	-12.824	-4.089

Based on Table 5 the value of the Sig. Levene's Test for Equality of Variances is $0.354 > 0.05$. Therefore it can be interpreted that the data variance of the experimental group and control is homogeneous. Table 5 also show that the mean difference of learning outcomes of students in the experimental group and the control is 8.456. The output of the Independent Sample Test is known as the Sig. (2-tailed) value of $0.000 < 0.05$. Thus, the zero hypothesis is rejected and the research hypothesis is accepted, meaning there is a significant difference in the outcome of the linear algebra learning between groups that use e-learning based Edmodo learning, with groups using conventional learning.

In general, data analysis results show that there is an influence of the implementation of e-learning based Edmodo in Linear Algebra subject in the odd semester 2019/2020. The results are based on the average student learning results using e-learning based Edmodo are higher than conventional learning. The difference in learning outcomes between both sample groups is caused by several factors.

The average influence and difference of the learning outcomes are gained because in the experimental group using e-learning based Edmodo learning, which facilitates each student to tailor learning according to the absorption of each student, and can be done anywhere and anytime. It is evidenced by research (Hatip, A., & Listiana, 2019), that the implementation of e-learning based Edmodo is capable of improving student motivation and learning outcomes. Ibrahim and Suardiman (2014) state there is significant differences in learning outcomes after the implementation of e-learning based Edmodo.

Students who are taught using Edmodo differ from those who are taught with conventional learning. Students taught with conventional learning tend to be passive. Students only listen to teachers' explanations, so that learning is centered on the teacher. Students record the material

described by the teacher in class. When teachers provide questions, only a few students can answer. The use of conventional learning makes the teacher's role more dominant than the student's role in learning. This makes students only listen to the information provided by the teacher and perform the tasks given. The given task is undertaken without follow-up in the form of feedback from the teacher. This finding proves that there are differences in student learning outcomes when they are taught by e-learning based Edmodo and conventional teaching.

The results performed by the research (Basori, 2013), show that there is a significant increase in Edmodo's contributions in the lecture, where Edmodo features teaching and learning management is strongly supported. Edmodo based learning is very user friendly, making it straightforward to use. Furthermore the results gained show that students feel a high level of satisfaction with Edmodo. Other research results reveal that judging by its benefits and also its features, Edmodo is an excellent choice to use as an online learning medium for lecturers and students, where parents/guardians can monitor the progress of their child's learning activities (Bv, 2016).

Aisiyah et al (2017) revealed that the use of E-learning based Edmodo was able to improve student motivation and learning outcomes compared to classes not using Edmodo. Other research results also mention that using E-learning based Edmodo in geometry subjects makes math learning more engaging and interactive for students, and making learning in classless tedious (Hadi, F. R., & Rulviana, 2018).

Research conducted by Nugraheni, A. R. E., and Dina (2017), stated that there is an average difference in student learning outcomes that are given e-learning treatment, with students who are not given the same treatment. The student group who received e-learning had an average of 3.67, while a student group with no e-learning, had an average of 3.48. Other research results (Supriani, 2017) state that students who use e-learning through Quipper School get better grades, than students taught with conventional methods.

Research on the influence of e-learning outcomes is aligned with research conducted by A'yun et al., (2019), stating that there is a significant influence on e-learning towards mathematics student learning outcomes. Rahmatia et al., (2017) state that there is an e-learning influence on student learning outcomes in Banda Aceh on fractional material.

Conclusion

Based on the results of the t-test analysis $t_{count} = 3.857$ and $t_{table} = 1.995$ for $db = 69$ at the significance level of 5% calculations indicate that $t_{count} > t_{table}$ ($3.857 > 1.995$). This research also used SPSS for testing the hypothesis. The output of the Independent Sample Test



is known as the Sig. (2-tailed) value of $0.000 < 0.05$. Thus, the zero hypothesis is rejected and the research hypothesis is accepted. It means there is a significant difference in the learning outcome student on the linear algebra subjects between groups that use e-learning based Edmodo learning, with groups using conventional learning. It can be concluded that there is an influence of e-learning based Edmodo implementation towards the improvement of student learning outcomes in Tadris Mathematics. There is an effect on the use of e-learning based Edmodo on the increase of student learning outcomes in linear algebra subjects. Therefore lecturers are advised to utilise e-learning in the learning process to change teaching that is conventional toward the ICT utilisation in the process of management by the level of development of the Industry Revolution 4.0. This research can also be developed to examine the use of Edmodo in improving students' critical thinking.

REFERENCES

- A'yun, Q., Sujiwo C., D. A., & Hidayatullah, A. W. (2019). Pengaruh e-learning terhadap hasil belajar matematika pada mahasiswa teknik informatika. *Justindo (Jurnal Sistem Dan Teknologi Informasi Indonesia)*, 4(1), 27–35. <https://doi.org/https://doi.org/10.32528/justindo.v4i1.2420>
- Aisiyah, Y. D. P., Dewi, E. R. S., & Rahayu, P. (2017). Penerapan ELearning Berbasis Edmodo pada Materi Sistem Koordinasi untuk Meningkatkan Motivasi dan Hasil Belajar Siswa. *Seminar Nasional Sains Dan Entrepreneurship IV Tahun 2017*. <http://prosiding.upgris.ac.id/inde%0Ax.php/snse2017/snse2017/paper/%0Aview/1805>
- Al-said, K. M. (2015). Student's Perceptions of Edmodo and Mobile Learning and their Real Barriers towards them. *The Turkish Online Journal of Educational Technology (TOJET)*, 14(2), 167–180.
- Azizah, N., Farida, & Sugiharta, I. (2016). Model Pembelajaran E-Learning Berbantuan Aplikasi Education Edmodo Dalam Meningkatkan Pemahaman Konsep Matematis. *Seminar Nasional Matematika Dan Pendidikan Matematika UIN*, 415–422. <http://ejournal.radenintan.ac.id/index.php/pspm/article/view/2417/1946>
- Basori, B. (2013). Pemanfaatan social learning network "edmodo" dalam membantu perkuliahan teori bodi otomotif di prodi ptm jptk fkip uns. *Jiptek: Jurnal Ilmiah Pendidikan Teknik Dan Kejuruan*, 6(2). <https://doi.org/https://doi.org/10.20961/jiptek.v6i2.12562>
- Bv, U. B. U. (2016). E-learning berbasis edmodo dalam pengajaran bahasa inggris pada jurusan akuntansi politeknik negeri samarinda. *Eksis*, 12(1).
- Dwi, C., Tri, R., Liliana, I., & Dewi, K. (2017). Bahan Ajar Aljabar Linear Berbasis Kemampuan Pemahaman Matematis Abstrak. *Unnes Journal of Mathematics Education Research*, 6(32), 266–272.
- Fitria, M., Arnawa, M., & Lufri. (2014). Pengembangan Modul Aljabar Linear Elementer Bernuansa Konstruktivisme Berbantuan ICT. *EKSAKTA*, 1(3), 1–8.
- Hadi, F. R., & Rulviana, V. (2018). Analisis proses pembelajaran elearning berbasis edmodo pada mata kuliah geometri. *Jurnal Bidang Pendidikan Dasar*, 2(1), 63–68. <https://doi.org/https://doi.org/10.21067/jbpd.v2.i1.2200>
- Hanifah, H., Supriadi, N., & Widyastuti, R. (2019). Pengaruh Model Pembelajaran E-learning Berbantuan Media Pembelajaran Edmodo Terhadap Kemampuan Pemecahan Masalah

- Matematis Peserta Didik. *NUMERICAL: Jurnal Matematika Dan Pendidikan Matematika*, 3(1), 31–42. <https://doi.org/10.25217/numerical.v3i1.453>
- Hatip, A., & Listiana, Y. (2019). Minat, Kemandirian Dan Hasil Belajar Mahasiswa Pendidikan Matematika Dalam E-Learning Berbasis Edmodo. *Aksioma: Jurnal Program Studi Pendidikan Matematika*, 8(3), 485–496. <https://doi.org/http://doi.org/10.24127/ajpm.v8i3.2261>
- Hendratmoko, T., Kuswandi, D., & Setyosari, P. (2018). Tujuan Pembelajaran Berlandaskan Konsep Pendidikan Jiwa Merdeka Ki Hajar Dewantara. *JINOTEP (Jurnal Inovasi Dan Teknologi Pembelajaran) Kajian Dan Riset Dalam Teknologi Pembelajaran*, 3(2), 152-157.
- Ibrahim, D. S., & Suardiman, S. P. (2014). Pengaruh Penggunaan E-Learning Terhadap Motivasi dan Prestasi Belajar Matematika Siswa SD Negeri Tahunan Yogyakarta. *Jurnal Prima Edukasia*, 2(1), 66–79. <https://doi.org/https://doi.org/10.21831/jpe.v2i1.2645>
- Jupri, A., Drijvers, P., & Heuvel-Panhuizen, M. V. D. (2014). Difficulties in initial algebra learning in Indonesia. *Mathematics Education Research Journal*, 26(1), 683-710. <https://doi.org/http://dx.doi.org/10.1007/s13394-013-0097-0>
- Kholifah, S. N., & Buditjahjanto, I. G. P. A. (2016). *The Influence Of Blended Learning Learning Model On Learning Outcomes And Learning Motivation Of Class Xi Tei Students On The Data And Interface Learning Learning In Vocational School 1 Jetis Mojokerto*. 5(3), 975–982.
- Kusuma, B. J., Wardono, W., & Winarti, E. R. (2016). Kemampuan Literasi Matematika Peserta Didik pada Pembelajaran Realistik Berbantuan Edmodo. *Unnes Journal of Mathematics Education*, 5(3), 199–206.
- Mawardi, K., Dewi, E. S., Asmah, S., Pratiwi, T. N., Sari, U. I., & Putra, F. G. (n.d.). Developing Islamic-Nuanced Linear Algebra Module with Guided-Inquiry approach in the Matrix Material. In *Journal of Physics: Conference Series (Vol. 1155, No. 1, p. 012080)*.
- Megawanti, P. (2012). Hacking Education Problems in Indonesia. *Formatif*, 2(3), 234831. <https://doi.org/10.30998/formatif.v2i3.105>
- Nugraheni, A. R. E., & Dina, D. (2017). Pengaruh penerapan pembelajaran e-learning terhadap kemandirian dan minat belajar mahasiswa pada mata kuliah wawasan dan kajian mipa. *Edusains*, 9(1). <https://doi.org/https://doi.org/10.15408/es.v9i1.5458>

- Raharjo, J. F., & Sulaiman, H. (2017). Mengembangkan Kemampuan Pemahaman Konsep Bahan Ajar Berbantuan Aplikasi Education Edmodo. *Jurnal Teori Dan Riset Matematika (TEOREMA)*, 2(1).
- Rahmadika, S. (2014). *Efektivitas Penerapan Media Jejaring Sosial edmodo Dalam Meningkatkan Hasil Belajar Siswa Pada Mata Diklat Sistem Komputer*. Universitas Pendidikan Indonesia.
- Rahmatia, M., Monawati, M., & Darnius, S. (2017). Pengaruh Media E-Learning Terhadap Hasil Belajar Matematika Siswa Kelas IV SDN 20 Banda Aceh. *Jurnal Ilmiah Mahasiswa Pendidikan Guru Sekolah Dasar*, 2(1).
- Rahmawati, R. (. (2019). Penerapan Metode Mind Mapping Berbantuan Edmodo Blended Learning Untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis. *Jurnal Indiktika*, 1(1), 44–54.
- Sugiyono. (2017). *Metode Penelitian Bisnis: Pendekatan Kuantitatif, Kualitatif, Kombinasi, dan R&D*. CV. Alfabeta.
- Supriani, Y. (2017). Menumbuhkan Kemandirian Belajar Matematika Siswa Berbantuan Quipper School. *JIPMAT*, 1(2). [https://doi.org/https://doi.org/10.26877/jipmat.v1i2.1248](https://doi.org/10.26877/jipmat.v1i2.1248)
- Tafonao, T. (2018). Peranan Media Pembelajaran Dalam Meningkatkan Minat Belajar Mahasiswa. *Jurnal Komunikasi Pendidikan*, 2(2), 103. <https://doi.org/10.32585/jkp.v2i2.113>
- Thongmak, M. (2013). Social network system in the classroom: antecedents of Edmodo© adoption. *Journal of E-Learning and Higher Education*, 3(5), 1-15.
- Trisniawati, Muanifa, M. T., Widod, S. A. M., & Ardiyaningrum, A. (2018). Effect of Edmodo towards interests in mathematics learning. *The Sixth Seminar Nasional Pendidikan Matematika Universitas Ahmad Dahlan 2018*. <https://doi.org/10.1088/1742-6596/1188/1/012103>
- Wirda, W., Almasri, A., & Sukaya, S. (2018). Pengaruh Penggunaan Media Pembelajaran Elektronik Berbasis Edmodo Terhadap Hasil Belajar Siswa Pada Mata Diklat Melakukan Instalasi Sound System Kelas Xi Teknik Audio Video DI SMK N 1 Kinali. *Jurnal Vocational Teknik Elektronika Dan Informatika*, 2(2), 45–57.



- Wiyoko, T., Setiawan, I., Studi, P., Sekolah, G., & Belajar, M. (2019). Penerapan edmodo untuk meningkatkan motivasi belajar mahasiswa pgsd stkip muhammadiyah muara bungo. *Jurnal Muara Pendidikan*, 4(1), 238–245.
- Yazdi, M., Matematika, D. J., & Tadulako, U. (2012). E-learning as an Interactive Learning Media Based on Information Technology. *Jurnal Ilmiah Foristek*, 2(1), 143–152.
- Yunita, L. (2016). Efektifitas Problem Based Learning Berbantuan Edmodo Untuk Meningkatkan Prestasi Belajar Fisika. *Prosiding Seminar Nasional XI “Rekayasa Teknologi Industri Dan Informasi 2016 Sekolah Tinggi Teknologi Nasional Yogyakarta,”* 159–165.