The Effectiveness of Online Learning Assisted by Edmodo Application on Mastery of Science Concepts and Digital Literacy for Elementary Students

Dani Fajar Gumilar✉, and Andi Suhandi

Primary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

✉ dffajar@gmail.com

Abstract: The world is currently faced with a covid-19 pandemic situation that affects the entire order of life. In the field of education, it requires alternative learning that can be implemented at home, through distance learning, or online learning. Edmodo is an alternative that can facilitate the learning process online. This study aims to determine the effectiveness of online learning assisted by Edmodo on the mastery of science concepts and the digital literacy of elementary students. The method used in this research is pre-experimental with One Group Pre-test & Post-test design. The research subjects were students of class V SDN Jelegong 02 with a non-probability sample sampling technique from a purposive sample type. The research instrument used was a test of mastery of science concepts and a digital literacy questionnaire. The data analysis technique is by calculating the N-Gain score of each student and then categorizing it into high, medium, and low criteria and determining the effectiveness of learning based on the percentage of students who met the high criteria according to predetermined standards. The results showed that online learning assisted by the Edmodo application was effective for mastery of science concepts with low effectiveness criteria. The results of research on students' digital literacy in terms of individual competence, technical skill aspects, are at the advanced level with moderate effectiveness criteria. In the aspect of critical understanding, it is at an advanced level with moderate effectiveness criteria. Meanwhile, the communicative abilities aspect was at the medium level with low effectiveness criteria.

Keywords: Online Learning, Edmodo, Science Concepts, Digital Literacy, Elementary Students.

INTRODUCTION

The situation of the Covid-19 pandemic currently faced by almost all countries in the world has affected all lives, including in the field of education. On March 24, 2020, the Minister of Education and Culture of the Republic of Indonesia issued an Official Circular Letter Number 4 of 2020 concerning the Implementation of Education Policies in an Emergency for the Spread of COVID-19. Based on this circular, the policy for learning process activities in schools has changed. The learning process during the Covid-19 pandemic can be carried out at home, through distance learning, or online learning. Therefore, teachers need to prepare various forms of learning activities that can be carried out online. Several applications that provide information technology-based learning resources have begun to be widely used and developed by teachers as an alternative to online learning during the Covid-19 pandemic, one of which is the Edmodo application. Edmodo is a social network-based learning platform intended for teachers, students, and parents alike. Edmodo was first developed in late 2008 by Nic Borg and Jeff O'Hara and Edmodo itself is arguably an e-learning program that implements a learning system that is easy, efficient, and more enjoyable (Zakaria, 2019). The Edmodo application provides a safe and easy way to build virtual classes based on class divisions just like in school. Through the Edmodo application, teachers can send grades, assignments, and quizzes to students easily (Zakaria, 2019). Not only is the teaching and learning process between students and teachers easier, but teachers can also discuss with other teachers in other parts of the world, share teaching experiences, and so on (Zakaria, 2019). There are lots of features offered by Edmodo to support the learning process. The following features are found in Edmodo (Zakaria, 2019) including; poll, grade book, file, and links, quiz, library, assignment, award badge, parent code. Based on these features there are many conveniences obtained between teachers and students using Edmodo, among others, making it easier for students to share ideas or ideas,

share files, teachers can provide direct assignments and assessments, provide polls, conduct online discussions, and others (Oktaviani, Siswandari, & Muchsini, 2019). Through this Edmodo-assisted online learning, it is hoped that it can help students master learning concepts and improve students' digital literacy skills.

Mastery of learning concepts and digital literacy skills is important in learning during the current Covid-19 pandemic. According to Anderson & Krathwohl, (2010) a concept is a schema, mental model, or implicit and explicit theory. Schema deals with how knowledge is related to one another. According to Dahar, (in Hariyadi, et al. 2016: 1567) mastery of concepts is a student's ability to understand the scientific meaning, both theoretical concepts, and applications in everyday life. Mastery of concepts according to Bundu (2006) students who are considered to have mastered the concept are students who can respond to questions/stimuli that vary in the same group or category. In Arisanti's, Sopandi & Widodo's research (2016), it is explained that conceptual mastery is the student's ability to understand science scientifically, both in theory and in its application in everyday life. Students are said to master the concept if they can define concepts, identify and give examples or not examples of concepts so that with this ability they can bring a concept in another form that is not the same as in textbooks. According to Sanjaya (in Silviana, 2011, 50) states the indicators of concept mastery consist of; 1). able to present situations in various ways and know the differences, 2). able to classify objects based on whether or not the requirements that form the concept are met, 3). able to connect between concepts and procedures, 4). able to provide examples of concepts learned. Meanwhile, according to Wirasito (in Silviana, 2011, p. 50) states the indicators of concept mastery are as follows; 1). know the characteristics of a concept, 2). can connect between concepts, 3). can return to the concept in various situations, 4). can use the concept in solving a problem. The method used to measure students' level of conceptual

mastery was done by applying Bloom's taxonomy in Aderson & Krathwohl (2010) to measure students' cognitive processes, while the categories in the dimensions of students' cognitive processes were; (1) Remember, (2) Understand, (3) Apply, (4) Analyze, (5) Evaluate, and (6) Create. Mastery of science concepts in this study is only reviewed in five cognitive domains, namely remembering, understanding, applying, analyzing, and evaluating according to competency standards in heat transfer material. In addition to mastering the concept, this research will also analyze and describe students' digital literacy in terms of individual competence aspects. Digital literacy was first introduced by Gilster in 1997 in his book entitled Digital Literacy, digital literacy is defined as the ability to understand and use information in various forms from a very wide variety of sources accessed via computer devices (Kemendikbud, 2017)

The European Information Society also defines that digital literacy is the awareness, attitude, and ability of individuals to collect, identify, access, manage, integrate, evaluate, analyze using digital tools and facilities appropriately, build new knowledge, and communicate with others, making it possible there is constructive social action (Rahma, 2015, pp. 72-89). Common Sense Media mentioned that digital literacy includes three abilities, namely competence in using technology, interpreting and understanding digital content, and assessing its credibility as well as how to create, research and communicate with the right tools (Common Sense Media, 2009). From the above definitions, it can be concluded that digital literacy is the critical thinking ability of individuals in collecting, understanding, identifying, accessing, managing, integrating, evaluating, and analyzing digital technology appropriately. In research (Douglas & Belshaw, 2012, p.90) explains that there are eight essential elements in the development of digital literacy, namely as follows; 1). Culture, namely understanding the various contexts of digital users. 2). Cognitive, namely the power of thought in assessing content. 3).

Constructive, namely the creation of something expert and actual. 4). Communicative, namely understanding the performance of networks and communications in the digital world. 5). Responsible confidence. 6). Creative, doing new things in new ways. 7). Criticism in addressing the content. 8). Be socially responsible.

According to Beetham, Littlejohn, and McGill (in Stefany, et al, 2017, p.15) there are seven important elements in digital literacy including; 1) information literacy, 2) digital scholarship, 3) learning skills, 4) ICT Literacy, 5) privacy management, 6) communication and collaboration, and 7) media literacy. The European committee explained that to master digital literacy requires individual competence consisting of technical competence, critical understanding, and also the ability to communicate and participate (Akhirfiarta, 2017, p. 2). Ansert (in Soby, 2008, p. 122) defines individual competence as the skills, knowledge, and attitudes needed by a person to use digital media in the mastery of social knowledge and learning. Individual Competence is a person's ability to use and utilize media, for example, the ability to use, produce, analyze, and communicate messages through the media (Kurniawati, & Baroroh, 2016, p. 55). Individual competence is divided into 2 categories (Santoso, 2016, p. 86):

a. Personal Competence, which is a person's ability to use media and analyze media content. Personal competence consists of two variables; 1) Technical skills, namely technical skills in using the media. 2). Critical Understanding, namely cognitive abilities in using media such as the ability to understand, analyze, and evaluate media content.

b. Social Competence, which is a person's ability to communicate and build social relations through the media and be able to produce media content. Social competence consists of Communicative abilities, namely communication skills and participation through the media. These Communicative Abilities include the ability to build social relationships and participate in the community through the media. Besides, Communicative Abilities also include the ability to create and produce media content. Researchers used these two categories as indicators in the study by looking at the situations and conditions that occurred (Kurniawati, & Baroroh, 2016, p. 55).

Research on Edmodo-assisted online learning has been conducted by several researchers. The results of research by Oktaviani, Siswandari, and Muchsini. (2019) show that the application of Edmodo e-learning is effective in improving the learning outcomes of students in class XI Accounting for SMK. Research conducted by Suwarno (2017) concluded that the use of the PBMP model with Edmodo online media could improve the students' mastery of the Natural Science concepts of class VIII-B at SMP Negeri 2 Mataram. Another study was conducted by Rahmawati (2018) with the results of the study showing that the improvement of the mathematical problem-solving abilities of students who received learning using the mind mapping model assisted by Edmodo blended learning was better than students who received conventional learning. Based on the background and results of previous research, the authors carried out online learning project activities assisted by the Edmodo application and analyzed the effectiveness of online learning through the Edmodo application on students' mastery of science concepts and digital literacy in science learning in elementary schools. This research was conducted because no other research has been found regarding the effectiveness of the application of online learning assisted by Edmodo on the mastery of concepts and digital literacy of students, especially elementary students.

METHOD

The method used in this research is experimental or pre-experimental design. In experimental research, a treatment is applied and the effect of the treatment is then studied (Creswell, 2010). The independent variable in this study is online learning assisted by Edmodo application in the heat transfer material and the

dependent variable is the students' mastery of science concepts and digital literacy. The learning process is carried out online with the aid of the Edmodo application. At the beginning of learning, students work on pretest questions in the quiz feature on the Edmodo application. Learning is carried out in two meetings. The first meeting of students begins the learning activity by reading the material presented by the teacher through the Edmodo application. Then the students listened to the instructional videos and conducted experiments on heat transfer. Then students send student worksheets and videos of the results of their experiments through the assignment feature in the Edmodo application. At the second meeting, students read material about the application of heat transfer in everyday life. Then the teacher invites students to discuss via the chat feature in the comment's column. At the end of learning, the students and the teacher conclude the learning outcomes. As a closing lesson, students work on posttest questions through the quiz feature on the Edmodo application. After the lesson ends, the teacher gives a google form-assisted questionnaire embedded in the Edmodo application to measure students' digital literacy. This research was conducted at SD Negeri Jelegong 02, Kutawaringin District, Bandung. The research subjects were 32 Grade VI students. The sample determination is based on a non-probability sampling technique from a purposive sample type, namely a sampling technique with certain considerations (Martono, 2014).The research design used was a pre-experimental research design in the form of One Group Pre-test & Post-test Design in which the experimental group was not randomly selected. The research sample was given treatment within a certain period. The pre-test was carried out before the students received treatment and the post-test was carried out after the students received treatment (Sugiyono, 2016). The research design scheme can be seen in the following table.

Table 1. Pre-experimental design with one group pre-test & post-test design

Subject	Pretest	Treatment	Posttest
Experiment	O1	X	O2

The instrument used to measure the mastery of science concepts in this study is a test item consisting of 10 multiple choice questions arranged based on the level of students' cognitive processes in terms of five cognitive domains, namely remembering, understanding, applying, analyzing, and evaluating, based on Bloom's taxonomy which has been validated content based on expert judgment with the results of the instrument test used has met the elements of basic competence with good sentences per the psychological development of children aged class V Elementary School. Meanwhile, the instrument for measuring students' digital literacy uses a digital literacy questionnaire. The instrument is then tested empirically in terms of internal consistency analysis through the person product moment validity test on the 15 items of the digital literacy questionnaire. The results of the validity test showed that all test items tested were declared valid with a value of R count> 0.413 (E Table). The test reliability analysis used the Cronbach alpha reliability test. According to Sujarweni (2014), Quizonare is said to be reliable if the Cronbach alpha value is > 0.6. The results of the Cronbach alpha reliability test on the digital literacy questionnaire showed results were 0.892 > 0.6 so it could be said that the digital literacy instrument was reliable. Data analysis techniques to measure the effectiveness of online learning assisted by Edmodo applications on mastery of science concepts by calculating the N-Gain score of each student using the following formula:

$$\text{N-Gain} = \frac{Posttest\ score - Pretest\ score}{Ideal\ score - Pretes\ score}$$

The results of the N-gain score are then categorized into criteria based on Melzer (2002) as follows:

Table 2. Criteria for N-Gain Score

Score	Criteria
$g > 0.7$	High
$0.3 \le g \le 0.7$	Medium
$g < 0.3$	Low

If more than 70% of students get high N-Gain, it can be said that the effectiveness is high, if the number of students who get high N-Gain is between 50%-70% then it can be said that the effectiveness is moderate, and if only ≤ 50% of the number of students who get N -High gain can be said to be low effectiveness.

The instrument used to measure digital literacy is to use a student digital literacy questionnaire in terms of individual competence aspects which are compiled based on digital literacy indicators according to the European Commission (2009). The digital literacy questionnaire can be seen in the following table:

Table 3. Digital Literacy Questionnaire in terms of Individual Competence Aspects

No.	Student Digital Literacy Instruments	Aspects of Individual competence	Assessment Scale			
			SL	SR	KK	TP
1	I use Edmodo digital media for learning activities	Technical skills				
2	I can use several types of digital media for learning activities	Technical skills				
3	Apart from studying, I also use Edmodo digital media for other purposes such as; social media	Technical skills				
4	I only use books and never use Edmodo digital media for learning activities	Technical skills				
5	I prefer to use textbooks instead of Edmodo digital media	Technical skills				
6	I know the difference between ordinary media and digital media in learning	Critical understanding				
7	Edmodo digital media helps me understand learning materials	Critical understanding				
8	Edmodo digital media helps me gain new knowledge in utilizing and acquiring skills to use digital media	Critical understanding				
9	Edmodo digital media helps me complete my study assignments	Critical understanding				
10	Edmodo digital media makes it difficult for me to understand the material and complete learning assignments	Critical understanding				
11	I use Edmodo digital media to discuss and exchange ideas with friends in understanding learning materials	Communicative abilities				
12	I use Edmodo digital media to discuss and exchange ideas with friends to complete study tasks	Communicative abilities				
13	I take advantage of and can use Edmodo's digital media to communicate and collaborate	Communicative abilities				
14	I was able to share writing, comment, and send messages through Edmodo digital media	Communicative abilities				
15	I often make new friends, can make new friends, join social groups, and create social media groups through Edmodo digital media.	Communicative abilities				

Note:

For positive statements, the following causal assessments apply:
SL (Always): score 4
SR (Often): score 3
KK (Occasionally): score 2
TP (Never): score 1
* For negative statements, the opposite applies

The results of students' digital literacy scores are grouped into three levels of digital literacy based on the European Commission (2009) as follows:

TABEL 4. Level of Competence

Score	Level	Definition
0 - 1,33	Basic	Individuals have a set of abilities that allow the basic use of media. There is limited media use. Users know their basic functions, use them for specific purposes and to define tools. The capacity of the user to critically analyze the information received is still limited.
1,34 - 2,66	Medium	Individual communicative ability through media is also limited. Individuals fluent in the use of media, know their functions, and can operate them, are more complex. Expanded media use. The user knows how to get and assess the information he needs, as well as evaluate (and improve) his information retrieval strategy.
2,67 - 4	Advance	Individuals are very active in the use of media, aware of, and interested in the laws that affect their

use. Users have in-depth knowledge of techniques and language and can analyze (and, ultimately) change conditions affecting their communicative relationships and message creation. In the social sphere, the user can activate teamwork which allows him to solve problems.

Sources: European Commission Directorate-General Information Society and Media; Media Literacy Unit, 2009

If there are ≥ 70% students at the advanced level, it can be said that the level of effectiveness is high, if the number of students at the advanced level is between 50% - 70% it can be said that the effectiveness is moderate, and if only ≤ 50% of the number of students at the advanced level it can be said to be low effectiveness.

After processing data on the scores of mastery of science concepts in online learning assisted by the Edmodo application on the concept of heat transfer, the data for the pretest and posttest scores were obtained as follows:

RESULTS AND DISCUSSION

Mastery of Science Concepts

Table 5. The Pretest and Posttest Scores of Mastery of Science Concepts

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest scores on Mastery of Science Concepts	23	.00	90.00	56.9565	21.41257
Posttest scores on Mastery of Science Concepts	23	70.00	100.00	82.1739	9.02347
Valid N (listwise)	23				

From the pretest and posttest data, each student's N-Gain score was calculated and then categorized into high criteria (N-Gain score> 0.7), moderate (0.3 ≤ N-Gain scores ≤ 0.7) and low (N-Gain score <0.3) the following results were obtained:

Table 6. N-Gain Score Based on Criteria

Respondent (N)	N-Gain Score	Criteria
1	1,00	High
2	0,70	High
3	0,75	High
4	0,60	Moderate
5	0,33	Moderate
6	1,00	High
7	0,75	High
8	0,75	High
9	0,50	Moderate
10	0,50	Moderate
11	0,57	Moderate
12	0,00	Low
13	0,50	Moderate
14	0,67	Moderate
15	0,00	Low
16	0,33	Moderate
17	0,50	Moderate
18	0,50	Moderate
19	0,60	Moderate
20	0,50	Moderate
21	0,57	Moderate
22	0,67	Moderate
23	0,60	Moderate

From the N-Gain score data for each student then the percentage of the number of students was calculated based on the N-Gain score criteria (high, medium, and low), the following results were obtained:

Table 7. The Percentage of Students Based on the N-Gain Score Criteria

N-Gain Score Criteria	The number of students	Percentage (%)
High ($g > 0.7$)	6	26,09
Moderate ($0.3 ≤ g ≤ 0.7$)	15	65,22

Low ($g < 0.3$)	2	8,69
Total	23	100

From the data on the percentage of the number of students based on the N-Gain Score criteria, it was obtained that the number of students who received the high criteria was 6 out of 23 students overall so that the percentage was 26.09%. Because 26.09% ≤ 50%, it can be concluded that online learning assisted by the Edmodo application is effective for mastery of science concepts with low effectiveness criteria.

Student Digital Literacy

Students' digital literacy in online learning assisted by the Edmodo application on the concept of heat transfer is measured through a digital literacy questionnaire in terms of individual competence aspects which are compiled based on digital literacy indicators according to the European Commission (2009). Based on the instrument, the following data were obtained:

Table 8. Digital Literacy Average for Technical Skill Aspects

	N	Minimum	Maximum	Mean	Std. Deviation
Technical Skill	23	2.0	3.6	2.922	.5072
Valid N (listwise)	23				

Based on digital literacy score data on the technical skill aspect, the average score is 2.92. Based on this average score, it can be said that students' digital literacy in the technical skill aspect is at an advanced level where students are very active in the use of media, have in-depth knowledge and technical skills in utilizing Edmodo as a medium/learning resource.

Table 9. Average Digital Literacy Aspects of Critical Understanding

	N	Minimum	Maximum	Mean	Std. Deviation
Critical Understanding	23	2.0	3.8	2.852	.4718
Valid N (listwise)	23				

Based on the digital literacy score data on the critical understanding aspect, an average score of 2.85 was obtained. Based on this average score, it can be said that the digital literacy of students in the critical understanding aspect is at an advanced level. Where at this level students can know the rules for using the Edmodo application, students can collect information contained in Edmodo and identify it for learning activities, and students can understand the material presented by the teacher through the Edmodo application.

Table 10. Average Digital Literacy for Communicative Abilities Aspects

	N	Minimum	Maximum	Mean	Std. Deviation
Communicative Abilities	23	1.6	4.0	2.548	.5976
Valid N (listwise)	23				

Based on digital literacy score data on the Communicative Abilities aspect, an average score of 2.55 was obtained. Based on this average score, it can be said that students' digital literacy in the communicative abilities' aspect is at the medium level. Where at this level students have sufficient skills in utilizing digital media (Edmodo) to discuss and exchange ideas with friends in understanding learning materials and completing learning tasks, besides that students are sufficiently able to share writing, comment, and send messages via digital media (Edmodo). From the digital literacy score data for each student, the percentage of the number of students based on the digital literacy level (advanced, medium, and basic) is calculated as follows:

Table 11. Percentage of Total Students Based on Digital Literacy Level in terms of Individual Competence Aspects

Digital Literacy	Score	Digital Literacy Level	The Number of Students	Percentage (%)
	2,67 - 4	Advance	15	65,22
Technical Skill Aspect	1,34 - 2,66	Medium	8	34,78
	0 - 1,33	Basic	0	-
	Total Number of Students		23	100
	2,67 - 4	Advance	13	56,52
Critical Understanding Aspects	1,34 - 2,66	Medium	10	44,48
	0 - 1,33	Basic	0	-
	Total Number of Students		23	100
	2,67 - 4	Advance	6	26,09
Communicative Abilities Aspects	1,34 - 2,66	Medium	17	73,91
	0 - 1,33	Basic	0	-
	Total Number of Students		23	100

From the data on the percentage of the number of students based on the level of digital literacy in the technical skill aspect, it was found that the number of students who received advanced criteria was 15 out of 23 students overall, so the percentage was 65.22%. Because 65.22% is between 50% - 70%, it can be concluded that online learning assisted by the Edmodo application is effective against digital literacy in the technical skill aspect with moderate effectiveness criteria. In the aspect of Critical Understanding, it was found that the number of students who received advanced criteria was 13 students out of 23 students overall so that the percentage was 56.52%. Because 56.52% is between 50% - 70%, it can be concluded that online learning assisted by the Edmodo application is effective for digital literacy in the critical understanding aspect with moderate effectiveness criteria. Meanwhile, in the communicative abilities' aspect, the number of students who received advanced criteria was 6 out of 23 students in total, so the percentage was 26.09%. Because 26.09% <50%, it can be said that online learning assisted by the Edmodo application is effective against digital literacy in the communicative abilities' aspect with low effectiveness criteria. The results of this study are in line with the results of research conducted by Yagci (2015) which emphasizes the importance of e-learning in student collaboration and overall student skill development. E-learning enables students to acquire knowledge collaboratively thereby encouraging the exchange of experiences and knowledge among students, giving more freedom and flexibility in the learning process. Edmodo also helps students get access to education easily to improve learning outcomes (Mokhtar, 2018). In line with that, Maazi and Janfeshan (2018) reported a significant increase in student learning outcomes as a result of the use of Edmodo. Alqahtani (2019) describes that the use of Edmodo networks is statistically significant in improving student learning skills, and the results of the study also show that students have positive attitudes towards Edmodo.

CONCLUSION

The conclusion that can be drawn is based on the results of research on Edmodo-assisted online learning which has been implemented that online learning assisted by Edmodo applications is effective for mastery of science concepts in elementary students with low effectiveness criteria. This can be seen from the percentage of the number of students based on the criteria for the N-Gain score which is only 26.09% so it is in the low effectiveness criteria. The results of the student's digital literacy research in terms of individual competency aspects obtained an average score of digital literacy on the aspect of technical skills, namely 2.92 so that it is included in the advanced level. However, based on the percentage of students who obtained the advanced criteria, the overall results were 65.22%, so it can be concluded that online learning assisted by the Edmodo application is effective against digital literacy in the aspect of technical skills with moderate effectiveness criteria. In the aspect of critical understanding, an average score of 2.85 is obtained so that it is included in the

advanced level. The percentage of students who are included in the advanced criteria is 56.52%. So, it can be concluded that the effectiveness of online learning assisted by Edmodo application on digital literacy in the aspects of critical understanding is included in the criteria of moderate effectiveness. Meanwhile, for digital literacy in the aspect of communicative skills, an average score of 2.55 is obtained, so it is at a moderate level. The result of the percentage of students who are included in the advanced criteria is 26.09%, it can be concluded that online learning assisted by Edmodo application is effective in aspects of communicative abilities with low effectiveness criteria. The suggestions that the writer can give after conducting this research to all education practitioners are expected to carry out online learning activities assisted by Edmodo, they should pay attention to the factors that can support and hinder the implementation of learning activities so that online learning activities assisted by Edmodo can be carried out properly.

REFERENCES

Alqahtani, A. S. (2019). The use of Edmodo: Its impact on learning and students' attitudes toward IT. *Journal of Information Technology Education: Research, 18*, 319-330.

Anderson, L. dan Krathwohl, D. (2010). *Kerangka Landasan Untuk Pembelajaran, Pengajaran, dan Assesment Revisi Taksonomi Bloom.* Yogyakarta: Pustaka Belajar

Arisanti, W., O., L., Sopandi, W., dan Widodo, A., (2016). Analisis Penguasaan Konsep dan Keterampilan Berpikir Kreatif Siswa SD Melalui Project Based Learning. EduHumaniora: *Jurnal Pendidikan Dasar. 8*(1). 82-95

Belshaw, Douglas A.J. (2012). *What Is Digital Literacy? A Pragmatic Investigation.* Durham: E Theses Durham University.

Brilian, Trofi, Akhirfiarta. (2017). Literasi Digital Pada Pegawai RSUD Dr. Soetomo Surabaya. *Jurnal Fisip Universitas Airlangga*, *1*(2)

Bundu, Patta. (2006). *Penilaian Keterampilan Proses dan Sikap Ilmiah dalam Pembelajaran Sains di SD.* Jakarta: Depdiknas

Common Sense Media. (2009). *Digital Literacy and Citizenship in the 21st Century.*

Creswell, J. W. (2010*). Research design: pendekatan kualitatif, kuantitatif, dan mixed.* Yogjakarta: PT Pustaka Pelajar

Hariyadi, Dedi dkk. (2016). Pengaruh Model Pembelajaran Inkuiri Terbimbing Berbasis Lingkungan Terhadap Keterampilan Proses dan Penguasaan Konsep IPA Siswa Kelas VII Pada Materi Ekosistem. *Jurnal Pendidikan, 1*(8), 1567-1574

Juliana Kurniawati dan Siti Baroroh. (2016). Literasi Media Digital Mahasiswa Universitas Bengkulu. *Jurnal Komunikator Universitas Muhammadiyah Bengkulu*, *8*(2).

Kementerian Pendidikan Dan Kebudayaan. (2017). *Materi Pendukung Literasi Digital.* Jakarta: Pusat Perbukuan Departemen Pendidikan Nasional.

Maazi, H., & Janfeshan, K. (2018). The effect of the Edmodo social learning network on Iranian EFL learners writing skills. Cogent Education, 5(1), 1-17.

Martono, N (2014*). Metode Penelitian Kuantitatif: Analisis Isi dan Analisis Data Sekunder.* Depok: PT Rajagrafindo Persada

Meltzer, D.E (2002). The Relationship between mathematics Preparation and Conceptual Learning Gain in Physics: A Possible "Hidden Variable" in Diagnostics Pretest Scores. In American *Journal of Physics. 70*(12), 1259-1268.

Mokhtar, F. A. (2018). Breaking barriers through Edmodo: A qualitative approach on the perceptions of University of Malaya undergraduates. O*nline Learning, 22*(1), 61-80.

Oktaviani, A., Siswandari, dan Muchsini, B. (2019). Keefektifan Penerapan E-Learning Edmodo Untuk Meningkatkan Hasil Belajar Akuntansi Siswa. *Jurnal Tata Arta,* 5(2). 75-87

Rahma, Amalia. (2015). *The Third Information Systems International*

Conference Digital Literacy Learning System for Indonesian Citizen, *Procedia Computer Science*.

Rahmawati. (2018). Penerapan Metode Mind Mapping Berbantuan Edmodo Blended Learning Untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis. *INDIKTIKA (Jurnal Inovasi Pendidikan Matematika, 1*(1). 44-54

Santoso, A. (2016). Media Literacy Siswa Muslim Surabaya dalam Penggunaan Internet. *Jurnal Komunikasi Islam, 5*(6).

Søby, Morten. (2008). *Digital Competence from Education Policy to Pedagogy: The Norwegian Context.* Shear&Knobel.indd.

Stella Stefany, Dkk. (2017). Literasi Digital Dan Pembukaan Diri. *Jurnal Pemikiran dan Penelitian Sosiologi Universitas Padjadjaran*, *2*(1)

Sujarweni, V. Wiratna. (2014). *Metode Penelitian: Lengkap, Praktis, dan Mudah Dipahami.* Yogyakarta: Pustaka Baru Press.

Suwarno, L. (2017). Penerapan Model Pembelajaran Berpikir Melalui Pertanyaan (PBMP) Dengan Media Online Edmodo Dapat Meningkatkan Penguasaan Konsep Siswa Dalam Pelajaran IPA Pada Pokok Bahasan Sistem Tata Surya Pada Siswa Kelas VIII Di SMP Negeri 2 Mataram. *Jurnal Ilmiah Mandala Education (JIME), 3*(2). 145-163

Yagci, T. (2015). Blended learning via mobile social media & implementation of "EDMODO" in reading classes. *Advances in Language and Literary Studies, 6*(4), 41-47.

Zakaria. (2019). *Tentang Edmodo: Pengertian, Manfaat, dan Fitur-Fiturnya yang Wajib Anda Ketahui.* [online]. Diakses dari https://www.nesabamedia.com/pengertian-manfaat-dan-fitur-edmodo/