



Meta-Analysis: The Effectiveness of Using Blended Learning on Multiple Intelligences and Student Character Education during the Covid-19 Period

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ABSTRACT

Keywords:

Blended Learning;
Multiple Intelligence;
Character education;
Covid-19.

This study aims to determine the effectiveness of the use of integrated blended learning on multiple intelligences (multiple intelligence) and student character education during the COVID-19 period. This type of research is a meta-analysis research. The research sample came from a search of 21 national and international journals. Search articles through databases sourced from Google Scholar, Eric, IEEE, Science Director and Wiley. The sample selection technique is purposive sampling technique. The data sampled relates to the use of Blended Learning, Multiple Intelligence and character education. Data analysis used quantitative data analysis techniques by conducting effect size and N-Gain tests using JASP software version 26. The results showed that the use of STEM integrated blended learning was effective in increasing students' multiple intelligence with an average value of 76.25 and student character education of 75 with the value of effect size (ES) is 0.44 and the N-Gain is 0.65 category medium.



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A. INTRODUCTION

The industrial revolution 5.0 society has had such a great influence on human life. In the Industrial 5.0 era, all human work has been exposed to digital technology (Amin, 2017). Digital technology is the latest breakthrough that humans are able to get information quickly. All digital technology equipment can be accessed via the internet, including educational issues (Hasbullah, 2015). Education is an important concern for the progress of a country.

Education is something that can provide great progress on the quality of human resources (Widiara, 2018). Education in the 21st century must be supported by technology (F. A. Müller & Wulf, 2021). Technology helps the teaching and learning process to be interesting and effective. The use of technology is very helpful for students and lecturers in presenting subject matter (Oncu & Bichelmeyer, 2021). However, the learning system between students and lecturers has become limited since the spread of the Covid-19 virus.

Coronavirus disease-19 (Covid-19) is a type of virus that has made the world experience a health crisis that attacks the respiratory system (Chaturvedi *et al.*, 2021; Mishra *et al.*, 2020).

The Covid-19 virus was first identified in Wuhan, China (Abuhammad, 2020). This virus has attacked \pm 200 countries in the world (Latif, 2020). In Indonesia Virus-Covid-19 was first confirmed in Indonesia on March 11, 2020 (Oyedotun, 2020). This virus causes the face-to-face learning system to be online. Therefore, students and teachers must adapt the learning system. However, with these changes, it will affect multiple intelligences and character education in students.

Multiple intelligences are the concern of educators in realizing the quality of students (Karbono & Retnawati, 2020). Multiple intelligence is a person who has eight intelligences, namely logical, mathematical, kinesthetic, musical, interpersonal, personal, visual linguistic and verbal spatial intelligence. (Ahamad *et al.*, 2021; (Wilson, 2018). With this intelligence a person can easily solve various problems. Not only that, Multiple Intelligence (MI) is able to make it easier for teachers to see students' interests and talents (Erdem & Keklik, 2020). In addition, lecturers must be able to grow with character education in students. Therefore, it is necessary to have effective learning used to grow MI and student character, namely blended learning.

Blended learning is a very modern learning concept based on technology (Alsarayreh, 2020; Lapitan *et al.*, 2021). Blended learning can be done by educators face-to-face and online. In addition, with blended learning, teachers are able to apply learning technology to students easily (Morgan & Spies, 2020). Blended learning can improve student learning outcomes and achievement (Graham *et al.*, 2019; Santosa dkk, 2021).

Prior research by (Setiawan *et al.*, 2019) shows that blended learning is very effective to be applied in higher education. According to (Alrouji, 2020) learning with blended learning can improve writing competence in students. Research (Eryilmaz, 2015) states that blended learning is effective to be applied in a mixed learning environment. Study (Orcid *et al.*, 2019) stated that blended learning can improve student achievement and motivation. Study (Herlandy & Novalia, 2019) shows that STEM integrated blended learning is able to improve students' critical thinking. Therefore, this study aims to determine the effectiveness of the use of blended learning on multiple intelligence and student character education during the Covid-19 period.

B. METHODS

This research is a type of meta-analysis research. Meta-analysis research is a type of research that performs statistical calculations to perform data analysis (Santosa *et al.*, 2021). The research sample came from 24 national and international journals. The sample search used databases from Google Scholar, Eric, Scencedirect, IEEE and Springer. The sample selection technique is a purposive sampling technique. The sample selection took into account data related to the use of blended learning, multiple intelligence and character education in students. The data analysis technique used is quantitative and qualitative data analysis techniques by calculating the effect size and N-Gain values with JASP software. Criteria Effect Size (ES) as a Table 1 below.

Table. 1 Criteria Effect Size (ES)

Effect size (ES)	Criteria
$0 \leq ES \leq 0,2$	Low
$0,2 \leq ES \leq 0,8$	Medium
$ES \geq 0,8$	Hight

(Sumber: Cohen dalam (Khoiri, 2019)

N-Gain values with JASP software as Table 2 below.

Table 2. Criteria N-Gain

N-Gain	Criteria
$g > 0.7$	Hight
$0.3 \leq g \leq 0.7$	Medium
$g < 0.3$	Low

C. RESULT AND DISCUSSION

From the results of the analysis of 21 national and international articles published in 2011-2021 related to the use of integrated blended learning, the STEM approach can be seen in the Table 3 below.

Table 3. Meta-analysis of the Use of Blended Learning

No	Author	Article	Database	Effect Size
1	(Huda dkk, 2019)	Nasional	Google Scholar	0.61
2	(Putra <i>et al.</i> , 2020)	Nasional	Google Sholar	0.32
3	(Rofifah, 2020)	Nasional	Google Scholar	0.41
4	(Ma & Lee, 2021)	Internasional	Eric	0.72
5	(Eryilmaz, 2015)	Internasional	Eric	0.47
6	(Yudhana, 2021)	Internasional	Eric	0.35
7	(Müller& Mildenberger, 2021)	Internasional	Sciencedirect	0.23
8	(Reilly <i>et al.</i> , 2020)	Internasional	Sciencedirect	0.67
9	(Wong <i>et al.</i> , 2020)	Internasional	Eric	0.81
10	(Bangkom & Sukavatee, 2021)	Internasional	Eric	0.33
11	(Vo <i>et al.</i> , 2017)	Internasional	Sciencedirect	0.71
12	(Yuliana, 2019)	Nasional	Google Scholar	0.32
13	(Hasanah <i>et al.</i> , 2020)	Internasional	Eric	0.21
14	(Ariawan & Divayana, 2020)	Internasional	IEEE	0.39
15	(Bains <i>et al.</i> , 2011)	Internasional	Wiley	0.48
16	(Hikmat <i>et al.</i> , 2020)	Nasional	Google Scholar	0.20
17	(Yana, 2019)	Nasional	Google Scholar	0.27
18	(Akhmalia <i>et al.</i> , 2018)	Nasional	Google Scholar	0.36
19	(Mustakim, 2020)	Nasional	Google Scholar	0.24
20	(Ranjan, 2020)	Internasional	Wiley	0.63
21	(Abdelraheem, 2014)	Internasional	Eric	0.27
22	(Ho, 2016)	Internasional	Eric	0.55
Nilai Rata-rata Effect Size				0,44

Table 3 shows a meta-analysis of the use of blended learning from 22 reference articles where there are 8 national articles and 14 international articles with an average effect size (ES) of 0.44. Not only that, browsing articles through a database that can be seen in the Figure 1 below.

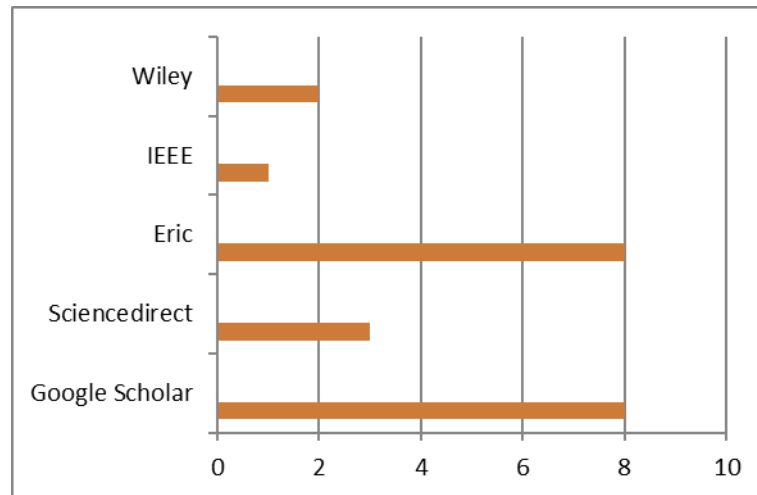


Figure 1. Article Database Meta-Analysis

Figure 1 explains that the use of blended learning is accessed through 5 databases, namely 8 journals from Google Scholar, 3 journals from ScienceDirect, 8 journals from Eric, 1 journal from IEEE and 2 journals from Wiley. In addition, meta-analysis was also carried out based on the type of research that can be seen in Table 4 below.

Table. 4 Meta-analysis by Type of Research

No	Research Type	Jumlah	Persentase (%)
1	Exsperiment	17	78
2	Meta-Analysis	1	4
3	Quantitative	4	18

Based on Table 4, there are three types of research related to the use of blended learning in learning, namely experimental research by 78%, meta-analysis by 1% and quantitative by 18%. However, the use of blended learning on multiple intelligences (Multiple intelligence) in students and character education can be seen in Table 5 below.

Table. 5 Average Value of the Use of Blended Learning on Multiple Intelligence students in the Covid-19 era

No	Intelligence Aspect	Class	
		Control	Exsperiment
1	Logica	65	75
2	Verbal	60	70
3	Music	60	80
4	Kinestetik	77	85
5	Interpersonal	60	70
6	Intrapersonal	55	75
7	Mathamatic	50	75
8	Spasial Verbal	60	80
	Mean	61	76,25

From Table. 4 explains that the average score (mean) of students who use blended learning in learning in the Covid-19 era before and after experiencing an increase. This can be seen in the control class that does not use blended learning, students only get a score of 61 and in the experimental class that uses blended learning students get a score of 76.25. In addition, the use of blended learning for student character education can be seen in Table 6 below.

Table. 6 Value of Character Education in Students Using Blended Learning in the Covid-19 Pandemic Era

No	Aspect	Class	
		Control	Exsperiment
1	Honesty	60	70
2	Creative	55	75
3	Independence	60	75
4	Diciplin	60	75
5	Like to read	50	80
6	Curiosity	55	80
7	Hard Work	55	70
Nilai rata-rata		56,42	75

Table. 5 explains the value of education for students who use blended learning in the Covid-19 era which is seen from 7 aspects, namely honesty, creativity, independence, discipline, love of reading, curiosity and hard work. The use of blended learning is very well used in the Covid-19 era. It can be seen that there is an increase in the class of affective values (student attitudes). Where the control class that does not use student blended learning only has an average score of 56.42 and the experimental class that uses blended learning in the Covid-19 era gets an average score of 75. To see the effectiveness of using blended learning on Multiple intelligence and student character education , then the N-gain test is performed. The results of the N-gain test can be seen in Table 7 below.

Table. 7 N-gain Test Results

Class	Nilai		N-Gain	Effect Size	Category
	Pretest	Posttest			
Control	65	70	0,65	0,44	Medium
Exsperiment	50	85			

Based on Table 6, the N-gain value in the control class is 0.5 in the medium category and the N-gain value in the experimental class is 0.8 in the high category. This means that the use of blended learning is very effective in increasing multiple intelligence and character education for students in the Covid-19 era.

The use of blended learning in the Covid-19 era is very effectively applied to students. This is based on the N-gain value of 0.65 and the Effect size of 0.44 in the high category. This opinion is in line with (Gide *et al.*, 2017) stated that blended learning was effectively implemented to help distance learning in the Covid-19 era. In addition, blended learning can increase students' learning motivation compared to conventional learning (Wong *et al.*, 2020). Effective blended learning in collaboration with learning technology (Chan, 2014; Huang *et al.*, 2021).

Learning should be able to make students understand the material easily and effectively. Blended learning or learning that is carried out offline and online is effectively used in various situations (Yick *et al.*, 2019). This is clearly very beneficial for educators and students in solving problems in education. The Covid-19 pandemic is not so much a problem for students to always study. According to (Hong *et al.*, 2013) By applying blended learning in universities, it is able to foster enthusiasm and train students to stay focused on learning. Not only that, blended learning is able to increase multiple intelligences (Multiple Intelligence and character education in students).

Multiple intelligence is a person's multiple intelligences. The use of blended learning is suitable for increasing multiple intelligences or multiple intelligences. This can be seen from the scores of students who use blended learning of 76.25. This is in line with the opinion (Prajitno &

Ladyawati, 2019) Blended learning is able to approach multiple intelligences in students. Multiple intelligences (multiple intelligences) can help educators to grow the potential and talents of students (Ghaznavi *et al.*, 2021). According to (Jones, 2017) Students have multiple intelligences that make it easier for educators to organize the concepts of the material being studied. In addition, character education in the Covid-19 era should be cultivated in students.

Character education is a very important thing to consider in realizing the quality of learning. Learning with Blended learning has been able to foster character education for students in the Covid-19 era. This can be seen from the student character education value of 75. This is in line with the opinion of (Putri, 2013) stated that the cultivation of character education is very necessary for students. According to (Arsanti, 2018) with character education helps improve students' creative skills. In addition, it can foster a sense of caring for each other (Qoyyimah, 2016).

D. CONCLUSION AND SUGGESTIONS

Based on the research above, it can be concluded that the use of STEM-integrated blended learning is effective in increasing students' multiple intelligence with an average value of 76.25 and student character education of 75 with an effect size (ES) value of 0.44 and an N-Gain of 0.65 category medium. In addition, the researcher gives advice to other researchers to continue this research in the future.

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