



Size Effect of Blended Learning Model on Students' Problem Solving Ability in Geography Learning

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Abstrak

Penelitian ini bertujuan untuk mengetahui efek size model blended learning terhadap pemecahan masalah siswa dalam pembelajaran geografi. Penelitian ini adalah penelitian meta-analisis. Sumber data dalam penelitian ini berasal dari 11 jurnal nasional dan internasional. Proses pencarian sumber data berasal dari Google Scholar, ScienceDirect dan Eric. Teknik pengumpulan data adalah observasi langsung dan dokumentasi melalui database online. Analisis data adalah teknik analisis statistik deskriptif kuantitatif dengan bantuan aplikasi JSAP. Hasil penelitian ini menunjukkan nilai rata-rata Effect Size (ES = 0.872) kriteria tinggi. Temuan ini menjelaskan adanya pengaruh yang signifikan model blended learning terhadap kemampuan pemecahan masalah siswa dalam pembelajaran geografi siswa. Selanjutnya, model pembelajaran blended learning dapat dilakukan secara online dan offline sehingga menciptakan suasana pembelajaran lebih efektif dan efisien tanpa batas waktu.

Kata Kunci: Blended Learning, Pendidikan, Pemecahan Masalah, Meta-analisis

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Abstract

This study aims to determine the effect size of the blended learning model on students' problem-solving in geography learning. This research is meta-analysis research. The data sources in this study came from 11 national and international journals. The data source search process comes from Google Scholar, ScienceDirect, and Eric. Data collection techniques are direct observation and documentation through online databases. Data analysis is a quantitative descriptive statistical analysis technique with the help of the JSAP application. The results of this study show the average value of Effect Size (ES = 0.872) high criteria. This finding explains the significant effect of the blended learning model on students' problem-solving ability in geography learning. Furthermore, the blended learning model can be done online and offline so as to create a more effective and efficient learning atmosphere without time limits.

Keywords: Blended Learning, Education, Problem Solving, Meta-analysis

Introduction

Problem solving is an ability that students must have in providing ideas or solutions in solving a problem in learning activities (Rahmawati et al., 2022; Rahman et al., 2023; Zulkifli et al., 2022; Contente & Galvão, 2022; Topsakal et al., 2022). Problem solving skills help students more easily find solutions to every problem in learning (Sudarsono et al., 2022). Zengin et al., (2022) stated that problem solving skills are very important for facing the 21st century. Students who have problem solving skills will find it easier to understand learning concepts (Şahin, 2021; Tahir, 2020; Putri et al., 2019). Furthermore, students who have problem solving skills can apply knowledge and experience in everyday life (Suryani et al., 2020). However, students' problem solving skills in geography learning are still low (Sujiono et al., 2017).

Based on the results of the 2018 Programme for International Student Assessment (PISA) conducted by the Organization for Economic Co-operation and Development (OECD), the level of student problem solving in science literacy only obtained a score of 396, ranked 71 out of 78 members (Suryono et al., 2023; Zulyusri et al., 2022; Zulyusri, 2023; Suhaimi et al., 2022; Ichsan et al., 2022; Suharyat et al., 202; Santosa et al., 2023). The results of TIMSS (The Trends International Mathematics and Science Study) in 2011 conducted by IEA (International Association for the Evaluation of Educational Achievement) showed that students' understanding, reasoning and application in learning scored 397 lower than the average international score of 501 (Fariska & Erman, 2017). Furthermore, the learning process is teacher-centered so that it does not encourage students to provide solutions in learning (Afifah, & Sopiany, 2017). Students are unable to solve problems in learning (Ningsih, 2019) thus making the learning atmosphere less interesting. Priyandari et al., (2020) problems

in learning geography students are less concerned about the surrounding environment. Furthermore, the problems encountered in the geography learning process students are passive and do not utilize technology appropriately for learning activities and learning models that do not encourage problem solving skills in students (Nurhadi et al., 2018; Amin, 2017).

Blended learning is a learning model that can be conducted by teachers online with the help of the internet network and face-to-face (offline) in the classroom (Ernawati & Maniarta, 2022; Santosa et al., 2021; Rahman et al., 2023; Mamahit, 2021; Tan et al., 2022; Wahyudi et al., 2020). Blended learning model helps students' development in learning according to their learning style (Arifin & Abduh, 2021). Research results Khoiroh et al., (2017) blended learning model can improve student learning outcomes. Furthermore, the blended learning model helps teachers and students more effectively and without time limit in accessing information for learning through specific platforms (Bedebayeva et al., 2022; Katasila & Poonpon, 2022; Bursa, 2023; Ichsan et al., 2023). Blended learning model is one of the latest learning models based on technology (Sari, 2019). Research results Habibah et al., (2022) blended learning model can improve students' critical thinking skills in learning.

Previous research by Sari & Wibowo (2021) stated that blended learning has a significant influence on students' interest and learning achievement. Research by Setiawan et al., (2022) blended learning model can encourage concept understanding and problem solving skills in learning mathematics. Blended learning models make the learning atmosphere more enjoyable and students find it easier to understand the subject matter (Lestari et al., 2016). Previous research by (Suana et al., 2019) blended learning model is very effective in improving students' critical and creative thinking skills

in learning. However, in reality, many studies on the effect of blended learning models in learning activities are still few that describe the size effect of blended learning models in geography learning. Based on the above problems, this study aims to determine the size effect of blended learning model on students' problem solving in geography learning.

Methods

This research is a meta-analysis study. Meta-analysis is a type of research that traces previous studies that can be analyzed quantitatively with statistics (Razak et al., 2021; Supriyadi et al., 2023; Suharyat et al., 2022; Musna et al., 2021; Karim et al., 2023; Sofianora et al., 2023). The data sources in this study came from 11 national and international journals published in 2016-2023. The process of searching for data sources through Google Scholar, ScienceDirect and Eric. The technique of collecting data sources is direct observation and documentation through online databases. The keywords used are Blended Learning Model, problem solving skills and geography learning. Data analysis technique is statistical quantitative analysis with the help of JSAP application. To calculate the effect size using Glass formula (Glass, 1998). Glass formula is:

$$ES = \frac{X_{Posttest} - X_{Pretest}}{SD_{Pretest}}$$

or

$$ES = \frac{\sqrt{(N1 - 1)S1^2 + (N2 - 2)S2^2}}{N1 + N2 - 2}$$

or

$$ES = t \sqrt{\frac{1}{ne} - \frac{1}{nc}}$$

Description:

- ES : Effect Size
- X_{Posttest} : Posttest Average
- X_{Pretest} : Pretest Average
- SD_{Pretest} : Standar deviation
- n_e : Sample size Experimental Class
- n_c : Sample size Control Class
- t : Value of t
- n : Number of samples

Furthermore, the criteria for the effect size (ES) value can be seen in Table 1.

Table 1. Effect Size Criteria

Effect Size	Criteria
0 ≤ ES ≤ 0.20	Low
0.2 ≤ ES ≤ 0.80	Medium
ES ≥ 0.80	Hight

Source : (Luvia et al., 2021; Santosa et al., 2021; Rahman et al., 2023)

Result and Discussion

The meta-analysis of 11 national and international journals on the effect of blended learning model on students' problem solving skills was then used as the data source. Furthermore, each data source was calculated for effect size and standard error values which can be seen in Table 2.

Table 2. Effect Size Value of Each Journal

Journal Code	Year	Effect Size	Standar Error	Criteria effect size
J1	2017	0.40	0.42	Medium
J2	2022	1.31	0.70	Hight
J3	2021	0.67	0.38	Medium
J4	2023	0.51	0.29	Medium
J5	2022	1.40	0.67	Hight
J6	2022	0.82	0.41	Hight
J7	2021	0.73	0.33	Medium
J8	2023	0.49	0.27	Low
J9	2021	0.90	0.52	Hight
J10	2022	1.25	0.86	Hight
J11	2021	0.77	0.32	Medium
Rata-rata Effect Size (ES)		0.982		Hight

Table 2 shows that the average effect size value is 0.982 with high criteria. These results explain that the blended learning model has a high impact on students' problem solving skills. The application of blended learning model can encourage students to be more active so as to stimulate students to have problem solving skills in geography learning (Suana & Raviany, 2019; Sulistiyoningsih, 2015). Students who have problem solving skills are able to solve a difficult problem in learning (Hamzah et al., 2022). Research results Alajmi (2021) blended learning model helps students in improving problem solving skills and learning outcomes in geography learning. In learning geography, students must be able to solve all problems that occur in the daily environment.

Furthermore, the blended learning process helps students more easily understand and master the technology that can be used in geography learning (Sari, 2021; Permana et al., 2021). Research results by Waty & Susilo (2018) stated that geography learning using blended learning model can improve students' learning outcomes and creativity. In addition, the blended learning model encourages students to think critically and solve problems in learning geography. Research result (Munzadi, 2018) The application of the blended learning model increases students' interest and learning outcomes in geography, thus encouraging them to have problem-solving skills. The blended learning model helps students understand geography learning materials more easily (Jazuli et al., 2022; Alwan, 2017). The next step, conducting a meta-analysis of education levels, can be seen in Table 3.

Table 3. Meta-analysis based on education level

Education Level	Journal Code	Effect Size	Effect Size Average	Criteria
SD	J2	0.40	0.74	Medium

	J3	0.67		
	J4	0.51		
	J5	1.40		
SMP	J8	0.49	0.88	Hight
	J9	0.90		
	J10	1.25		
SMA	J1	0.97	0.84	Hight
	J6	0.82		
	J7	0.73		
PT	J11	0.77	0.77	Medium

Based on Table 3. It shows that the average effect size value based on education level is 0.74 medium criteria, 0.88 high criteria, 0.84 high criteria and 0.77 medium criteria. These results explain that the blended learning model provides a large influence on each level of education. Research results by Iqbal et al., (2022) stated that the blended learning model influences students' cognitive development in the learning process. Furthermore, the blended learning model is effectively utilized in distance learning (Sari, 2019; Fradila et al., 2021). Not only that, the blended learning model encourages student learning outcomes so as to motivate students in improving problem solving skills in geography learning (Tahir, 2020; Hariyani, 2021). Therefore, blended learning model needs to be applied in geography learning (Aisyah et al., 2020). Furthermore, the application of blended learning model is one of the teacher's solutions in encouraging students' problem solving skills in learning geography.

Conclusion

From the above research, it can be concluded that the average value of Effect Size (ES = 0.872) is high. This finding explains the significant effect of blended learning model on students' problem solving skills in geography learning. Furthermore, the blended learning model can be done online

and offline so as to create a more effective and efficient learning atmosphere without time limits. Not only that, the blended learning model is very helpful for teachers and students in carrying out the learning process without time limits.

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