The Effectiveness of Ethnopedagogy Based Problem Based Learning Model on Students' Digital Literacy

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Abstrak

Tujuan penelitian ini untuk mengetahui efektivitas model problem based learning berbasis etnopedagogi terhadap literasi digital siswa. Jenis penelitian adalah penelitian meta-analisis. Sumber data dalam penelitian berasal dari 13 jurnal nasional dan interansional yang terbit dari tahun 2021-2024. Pencarian sumber data melalui database online google scholar, ScienceDirect, Wiley dan Researchgate. Teknik pengumpulan data adalah observasi langsung dan dokumentasi. Kriteria inklusi adalah penelitian berasal dari jurnal dan prosiding terindeks Sinta, Scopus, EBSCO, Copernicus Internasional dan IEEE, Penelitian berkaitan dengan model project based learning berbasis etnopedagogi terhadap literasi digital siswa, penelitian memiliki data yang lengkap untuk menghitung effect size, penelitian harus open acces, dan mempunyai ukiuran sampel 25 siswa. Analisis data melalui analisis kuantitatif dengan menghitung nilai effect size dari setiap penelitian dengan bantuan aplikasi JSAP. Hasil penelitian menyimpulkan bahwa model problem based learning berbasis etnopedagogi memberikan pengaruh yang signifikan terhadap literasi digital dengan nilai rata-rata effect size sebesar 0.856 dengan kriteria effect size tinggi. Temuan ini memberikan informasi penting bagi guru dalam penerapan problem based learning berbasis etnopedagogi siswa untuk mengembangakn literasi digital.

Kata Kunci: *Problem Based learning, Etnopedagogi, Literasi Digital, Effect Size*

Abstract

The aim of this research is to determine the effectiveness of the ethnopedagogy-based problem based learning model on students' digital literacy. The type of research is meta-analysis research. The data sources in the research come from 13 national and international journals published from 2021-2024. Search for data sources through the online databases Google Scholar, ScienceDirect, Wiley and Researchgate. Data collection techniques are direct observation and documentation. Inclusion criteria are research originating from journals and proceedings indexed by Sinta, Scopus, EBSCO, Copernicus International and IEEE, research related to ethnopedagogy-based project based learning models for students' digital literacy, research having complete data to calculate the effect size, research must be open access, and has a sample size of 25 students. Data analysis through quantitative analysis by calculating

the effect size value of each study with the help of the JSAP application. The research results concluded that the problem based learning model based on ethnopedagogy had a significant influence on digital literacy with an average effect size value of 0.819 with high effect size criteria. These findings provide important information for teachers in implementing problem based learning based on student ethnopedagogy to develop digital literacy.

Keywords*: Problem Based learning, Ethnopedagogy, Digital Literacy, Effect Size*

Introduction

Literacy in the digital age has become increasingly crucial as technology pervades every aspect of modern life (Martin & Grudziecki, 2016). Digital literacy encompasses the ability to navigate, evaluate, and utilize information effectively and responsibly in online environments. Research in this domain often explores various dimensions of digital literacy, including but not limited to information literacy, media literacy, and technological proficiency (Gaytan et al., 2023; Purwanto et al., 2023). Scholars investigate how individuals acquire these skills, the impact of digital literacy on education and employment, and the implications for social inclusion and participation in the digital society. Understanding the dynamics of digital literacy is vital for policymakers, educators, and businesses to design effective strategies for promoting digital competence and bridging the digital divide (Zulu et al., 2023).

Moreover, studies in the field of digital literacy delve into the challenges and opportunities presented by rapid technological advancements (Gouseti et al., 2023). This research examines the evolving nature of digital platforms and the implications for individuals and society (Gede et al., 2023). Scholars investigate issues such as online privacy and security, digital misinformation and fake news, digital citizenship, and the ethical use of technology. Moreover, there is a growing focus on the role of digital literacy in fostering critical thinking, creativity, and innovation in the digital age. By understanding the complexities of digital literacy, researchers aim to develop frameworks and interventions to empower individuals to navigate the digital landscape effectively and participate meaningfully in the digital society. Such insights are invaluable for shaping educational curricula, informing policy decisions, and fostering digital inclusion and equity in an increasingly digital world (Turhan, 2023; Suharyat et al., 2022; Santosa et al., 2021).

Research on the ethnopedagogy-based Problem-Based Learning (PBL) model for students' digital literacy highlights a number of important problems. First, in the PBL context, the main challenge is to develop problem situations that are appropriate to the students' ethnopedagogical context (Arjaya et al., 2023). Ethnopedagogy refers to educational practices that are reflected in students' culture and social context, which may vary by region or ethnic group. Therefore, research needs to pay attention to students' cultural diversity and social context so that the PBL model can be implemented effectively and relevantly (Ashari &; Faizin, 2023). Second, digital literacy has become an important aspect in the context of modern education, but there are still gaps in understanding and skills among students from different ethnic and cultural backgrounds. Research must explore how ethnopedagogy-based problem based learning models can increase students' digital literacy evenly without abandoning sensitivity to cultural diversity.

In addition, there are also problems related to research methodology and impact measurement (Putra &; Budiningsih, 2023; Oktarina et al., 2021). Research requires a holistic and inclusive approach in designing research instruments that can measure changes in students' digital literacy along with the implementation of the ethnopedagogy-based problem based learning model (Valentine, 2023). In addition, ensuring the validity and reliability of measurement instruments in diverse cultural contexts is a challenge. In addition, it is necessary to carry out long-term monitoring of the long-term effects of this problem based learning model on students' digital literacy. By understanding these issues thoroughly, this research can make a significant contribution to the development of education that is more inclusive and relevant for a future increasingly dominated by digital technology (Tomczyk, 2020; Sofyan et al., 2019).

Gaps or uniqueness can be found in previous research which rarely pays attention to the integration between the Problem-Based Learning model and ethnopedagogical approaches in the context of students' digital literacy (Nurtanto et al., 2020; Tohara et. al., 2021; Fradila et al., 2021; Elfira et al., 2023). This meta-analysis will bridge this gap by specifically exploring the impact of using an ethnopedagogy-based PBL model on students' digital literacy (Putra et al., 2023; Arsih et al., 2021). By focusing on cultural aspects in education, this research will provide deeper insight into how culturally adapted pedagogical approaches can improve the digital understanding and skills of students from various ethnic backgrounds (Solissa et al., 2023).

Apart from that, the uniqueness of this meta-analysis also lies in its ability to produce a more holistic understanding of the influence of ethnopedagogy-based problem based learning models on students' digital literacy through data synthesis from various existing studies (Rahmawati et al., 2020; Nurtamam et al., 2023). By analyzing patterns and trends from a number of separate studies, this meta-analysis will provide comprehensive insight into the effectiveness of ethnopedagogy-based PBL models in improving students' overall digital literacy (Fahrutdinova, 2016; Lestari &; Bahri, 2021). This will provide valuable guidance for the development of pedagogy that is more inclusive and oriented towards student needs in facing digital literacy challenges in today's digital era. Therefore, the aim of this research is to determine the effectiveness of the ethnopedagogy-based problem based learning model on students' digital literacy.

Methods

This type of research is meta-analysis research. Meta-analysis is a type of research that collects and analyzes data quantitatively to come to an accurate conclusion (Zulkifli et al., 2022; Chamdani et al., 2022; Suryono et al., 2023; Sofianora et al., 2023; Suparman et al., 2021). The data sources in the research come from 13 national and international journals published from 2021-2024. Search for data sources through the online databases Google Scholar, ScienceDirect, Wiley and Researchgate. Data collection techniques are direct observation and documentation. Inclusion criteria are research originating from journals and proceedings indexed by Sinta, Scopus, EBSCO, Copernicus International and IEEE, research related to ethnopedagogy-based project based learning models for students' digital literacy, research having complete data to calculate the effect size, research must be open access, and has a sample size of 25 students. Data analysis through

quantitative analysis by calculating the effect size value of each study with the help of the JSAP application. Furthermore, the effect size criteria in the study are guided by the effect size criteria Cohen et al., (2007) can be seen in Table 1.

Table 1. Effect Size Value Criteria

Effect Size	Criterion
0.0≤ ES ≤0.2	Low
0.20≤ ES ≤0.80	Medium
ES ≥ 0.80	High

Result and Discussion

From a database search through Google Scholar, ScienceDirect, Wiley and Researchgate related to ethnopedagogy-based problem-based learning models on students' digital literacy, 285 journals were obtained, but only 13 journals met the predetermined inclusion criteria. The process of filtering the data entered in the meta-analysis data can be seen in figure 1.
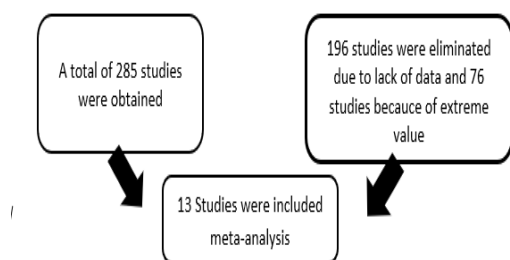
Figure 1. Data Selection Process

Furthermore, data that meet the inclusion criteria are calculated effect size values from each journal which can be seen in Table 2.

Table 2. Effect Size Value 13 Journal

Study Code	Year	Effect Size	Standard Error	Effect Size Criteria
Study 1	2024	1.07	0.45	High
Study 2	2024	1.24	0.66	High
Study 3	2023	0.27	0.10	Medium
Study 4	2022	0.82	0.41	High
Study 5	2021	0.91	0.38	High
Study 6	2024	0.68	0.27	Medium
Study 7	2022	1.30	0.33	High
Study 8	2022	1.05	0.53	High
Study 9	2023	0.64	0.18	High
Study 10	2023	0.37	0.12	Medium
Study 11	2021	0.17	-0.42	Low
Study 12	2021	0.76	0.30	Medium
Study 13	2023	1.86	0.49	High
Effect size average		0.856	0.292	High

Table 2, the results of effect size analysis from 13 journals obtained the highest effect size value of 1.86 and the lowest effect size of 0.17. According to the effect size criterion Cohen et al., (2007) There were eight studies (n = 8) high effect size criteria, four studies (n = 4) had a medium effect size value and one study (n = 1) had a low effect size value. Furthermore, the standard error value of the 13 journals ranged from -0.42 to 0.66 and the average value of the entire journal was 0.856 and the average standard error value was 0.292. These results can be concluded that the ethnopedagogy-based problem-based learning model on students' science literacy with high influence categories. Research in line with Jaswati et al., (2023) The probelem-based learning model has a positive influence on students' digital literacy in learning. This research is proven Windfall et al., (2022)

Ethnopedagogy-based problem-based learning models can develop students' digital literacy and critical thinking skills in learning.

Furthermore, Through synthesizing findings from multiple studies, this research aims to provide insights into the overall impact and efficacy of the proposed educational model. By analyzing a diverse range of empirical studies, the meta-analysis assesses the consistency and strength of the relationship between the PBL-based ethnopedagogical approach and students' digital literacy outcomes across various educational contexts (Rini, 2022). This systematic examination allows researchers to identify trends, patterns, and potential moderators that may influence the effectiveness of the intervention.

Moreover, the meta-analysis delves into the underlying mechanisms through which the prblem based learning based ethnopedagogical approach influences students' digital literacy development (Widana, 2020). By conducting a rigorous analysis of empirical data, researchers can elucidate the pathways through which this educational model facilitates the acquisition of digital skills, critical thinking abilities, and digital citizenship competencies among students. Additionally, the meta-analysis may explore potential factors that mediate or moderate the relationship between the intervention and digital literacy outcomes, such as students' prior knowledge, instructional practices, and contextual factors. The findings of this meta-analysis offer valuable insights for educators, policymakers, and researchers seeking evidence-based strategies to enhance students' digital literacy in diverse educational settings (Hadian et al., 2024).

The present study integrates information from multiple research investigations to offer a thorough synopsis of the effects of the suggested instructional framework. The goal of the meta-analysis is to find similar trends, patterns, and variances in the results of using problem based learning based ethnopedagogy in various educational situations by conducting a thorough examination and analysis of the body of existing material (Majid, 2021). Researchers can ascertain the total effect size of the intervention on students' digital literacy skills by quantitatively synthesising the results of several trials. This provides important insights into the effectiveness of this pedagogicaltechnique. The meta-analysis also explores the subtleties of the connection between students' outcomes in digital literacy and the problem based learning-based ethnopedagogical approach. Subgroup analyses and investigation of potential moderators, including grade level, topic matter, and length of intervention, allow researchers to pinpoint variables that might affect the efficacy of the instructional approach (Azis &; Nugraha, 2021). Therefore, the application of ethnopedagigi-based problem-based learning models is very important for teachers to develop students' digital literacy in the current era of globalization.

Conclusion

From the results of this study, it can be concluded that the ethnopedagogy-based problem-based learning model has a significant influence on digital literacy with an average effect size value of 0.856 with high effect size criteria. This finding provides important information for teachers in the application of problem-based learning based on student ethnopedagogy to develop digital literacy. These findings provide a better understanding of the factors that influence the effectiveness of this educational model,

including differences in grade levels, subjects, and length of intervention. In addition, this meta-analysis also identifies the mechanisms underlying the positive influence of ethnopedagogy-based problem based learning models on students' digital literacy development, providing a basis for the development of more effective learning strategies in the future. As such, this research makes a valuable contribution to digital literacy education and informs more efficient educational policy making and practices to face future challenges in the digital age.

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