Pertanika

PROCEEDINGS

PP

VOL. 1 (2) 2025

The 3rd International Conference on Learning Innovation and Research in Basic Education 2024

Guest Editors

Yusuf Hanafi, Toto Nusantara and Nurul Murtadho

PERTANIKA JOURNALS

A scientific journal published by Universiti Putra Malaysia Press

Pertanika Proceedings
Pertanika Proceedings

PERTANIKA PROCEEDINGS

About the Journal

Overview

Pertanika Journal is an official journal of Universiti Putra Malaysia. It is an open-access online scientific journal. It publishes the scientific outputs. It neither accepts nor commissions third party content.

Pertanika Proceeding is an open-access conference proceeding series that covers all research fields. The proceeding series is a quarterly periodical that considers for publication of original articles as per its scope.

Recognized internationally, *Pertanika* is committed to providing high-quality services and making conference output widely available. You can utilise our experience and services to transform your conference publication into a globally accessible scientific work.

Aims and Scope

Pertanika Proceedings aims to provide a forum for high quality research related to the field of science, and social sciences and humanities. Area relevant to the scope of the proceedings include agricultural sciences, biological sciences, marine sciences, applied sciences and technologies, chemical sciences, earth sciences, engineering sciences, environmental sciences, information, computer and communication technologies, material sciences, physical sciences, medical and health sciences, mathematical science, architecture and habitat, consumer and family economics, education, consumer law, media and communication studies, political sciences and public policy, population studies, psychology, sociology, tourism, arts and culture, dance, language and linguistics, literature, music, philosophy and sports.

Aim

Pertanika Proceeding is an open-access proceeding series that provides a fast, versatile, and cost-effective publication service for proceeding papers.

Vision

To publish journals of international repute.

Mission

Our goal is to bring the highest quality research to the widest possible audience.

Quality

We aim for excellence, sustained by a responsible and professional approach to journal publishing. Submissions are guaranteed to receive a decision within 90 days. The elapsed time from submission to publication for the articles averages 180 days. We are working towards decreasing the processing time with the help of our editors and the reviewers.

Publication Policy

Pertanika policy prohibits an author from submitting the same manuscript for concurrent consideration by two or more publications. It prohibits as well publication of any manuscript that has already been published either in whole or substantial part elsewhere. It also does not permit publication of manuscript that has been published in full in proceedings.

Code of Ethics

The *Pertanika* journals and Universiti Putra Malaysia take seriously the responsibility of all its journal publications to reflect the highest publication ethics. Thus, all journals and journal editors are expected to abide by the journal's codes of ethics. Refer to *Pertanika*'s **Code of Ethics** for full details, available on the official website of *Pertanika*.

Pertanika

PROCEEDINGS

The 3rd International Conference on Learning Innovation and Research in Basic Education 2024

Vol. 1 (2) 2025

Guest Editors
Yusuf Hanafi, Toto Nusantara and Nurul Murtadho

PERTANIKA JOURNALS

A scientific journal published by Universiti Putra Malaysia Press

Pertanika PROCEEDINGS
AN INTERNATIONAL PEER-REVIEWED JOURNAL

EDITORIAL OFFICE
JOURNAL DIVISION
Putra Science Park
1st Floor, IDEA Tower II
UPM-MTDC Technology Centre
Universiti Putra Malaysia
43400 Serdang, Selangor Malaysia.

General Enquiry
Tel. No: +603 9769 1622
E-mail: pertanika.proceeding@upm.edu.my
URL: http://www.pertanika.upm.edu.my/

PUBLISHER
UPM Press
Universiti Putra Malaysia
43400 UPM, Serdang, Selangor,
Malaysia.
Tel: +603 9769 8855
E-mail: dir.penerbit@upm.edu.my
URL: http://penerbit.upm.edu.my

Pertanika Proceedings
Vol. 1 (2) 2025
Contents

Preface

We are pleased to introduce this proceeding of the PERTANIKA, this year's conference theme was "Technology and Sustainability: Innovations and Solutions to Shape the Future of Basic Education in the Era of Society 5.0". The conference explored leading-edge innovations and solutions that are critical in shaping the future of basic education.

The twenty nine articles compiled in this edition represent diverse research, insights, and practices from scholars and practitioners across various nations. The conference addressed key issues on 11 conference topics including: Utilisation and Implementation of Learning Technology in Basic Education, ICT for Learning, Digitalisation in Scientific Writing Scientific Writing for Education, Implementation of Technology for Literature and Language Learning, Science and Technology Learning, Mathematics Learning, Social Studies Learning, Civic Education, Art Education, Assessment Techniques and Learning Evaluation in Primary and Secondary Schools.

As editors, we believe that this collection will make a significant contribution to the development of technology in basic education. By exploring the implementation of technology in the fields of science, math, language, social studies, civics, and assessment, we hope that this dissemination of technology in the field of basic education can increase the understanding of educators to continue to innovate in applying technology so as to achieve optimal learning goals.

We sincerely thank the authors who have contributed their expertise and perspectives to this proceeding. We also thank the reviewers and editorial team members who have dedicated their time to ensure the quality and relevance of the published works.

We hope readers will find these proceedings informative, thought-provoking and inspiring as we continue to advance knowledge and practice in the field of technology in basic education.

Guest Editors
Yusuf Hanafi (Prof. Dr.)
Toto Nusantara (Prof. Dr.)
Nurul Murtadho (Prof. Dr.)

Pertanika Proceedings 1 (2): 1 - 6 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Implementation of Artificial Intelligence in Economics Subjects: Literature Review

Alfred Liubana*, Kurjono, Dadang Dahlan and Amilusholihah

Department of Economics Education, Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, Bandung 40154, Indonesia

ABSTRACT

This research aims to analyze the implementation of artificial intelligence in high school economics subjects. The implementation of AI in Economics learning is critical because it can increase the effectiveness and relevance of education, prepare students for future challenges, and answer the needs of education in the digital era. This type of research is a Systematic Literature Review (SLR). This literature study utilizes several reading sources such as books, notes, and research reports from previous studies. The data source of the research is based on the internet, such as e-books and online journals. Data obtained and selected according to the criteria set will be analyzed. Based on the research results, artificial intelligence applications often applied in learning economics include AI Virtual Mentors, Voice Assistants, Smart Content, Presentation Translators, Global Courses Automatic Assessment, and Personalized Learning. In the economics teaching environment, various artificial intelligence platforms can support the learning process, such as ChatGPT and Perplexity, DataBo, ELSA Speak, Formative AI, Gradescope Grammarly, and PowerPoint. Although AI offers convenience in the learning process, it is also accompanied by various threats to the continuity of education in Indonesia.

Keywords: Education, artificial intelligence, economics

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.001

E-mail addresses:
alfredliubana@upi.edu (Alfred Liubana)
kurjono@upi.edu (Kurjono)
dadangdahlan@upi.edu (Dadang Dahlan)
amilusholihah@upi.edu (Amilusholihah)
* Corresponding author

INTRODUCTION

The term Artificial Intelligence was first introduced by John McCarthy in 1955 (Zarei et al., 2024). Interest in artificial Intelligence in education has increased in recent years, especially with technological advances in artificial Intelligence (Stolpe & Hallstr, 2024). Artificial Intelligence typically refers to technologies that enable

e-ISSN: 3083-9475

machines to exhibit Intelligence similar to human cognition and processing capabilities; in other words, technologies empower machines to understand, reason, execute tasks, and address problems similar to humans. Artificial intelligence is a branch of computer science that includes a variety of technologies, such as robotics and computers, and enables logical reasoning, machine learning, and natural language understanding, Denning & Tedre (2019); Ouyang & Jiao (2021) and Vartiainen et al., (2020) in Lim (2023).

The application of Artificial Intelligence as Arabic learning media in the era of Society 5.0 as it is today has many benefits in supporting the learning process (A. N. Putri & Hasan, 2023). This artificial intelligence can overcome the limitations of humans as teachers or tutors in the learning process. The presence of Artificial Intelligence in education brings many benefits to various parties, including students, teachers, researchers, and others. Sariyasa and Monika (2023) Students' responses to artificial intelligence (AI) are as follows: 56.67% of students found AI responsive, 89.44% of students saw AI as a practical and efficient tool, 78.89% of students felt that AI was interactive, 94.17% of students stated the usefulness of AI in courses and design, and 94.67% of students found AI helpful in the individual learning process. Artificial intelligence systems can help them by making their educational tasks easier. However, AI's presence can also negatively impact education. In addition to providing many benefits, Artificial Intelligence can potentially have a detrimental impact, especially in Indonesia's education context (Astutik et al., 2023).

In Indonesia, artificial intelligence has been widely utilized in various industries, including education, healthcare, manufacturing, services, and products (Ririh et al., 2020). In analyzing the experience of using artificial intelligence in the learning process, it was found that, on average, 50% of respondents used it, 20% of respondents used it very often, and 20% sometimes used it. The other 10% of respondents said they never used it (Sandy et al., 2023). Arly et al. (2023) noted that as many as 25.9% of students routinely utilize artificial intelligence (AI) as a tool for completing lecture assignments. Implementing artificial intelligence-based learning systems is expected to support educators in answering student questions while allowing them to focus on fundamental aspects such as strategizing teaching methodologies for upcoming lessons (Susanto, 2023). Therefore, this article will discuss the implementation of artificial intelligence in economic learning, artificial intelligence often used in education, and the impact of artificial intelligence in financial learning.

METHODS

This literature study uses several reading sources such as books, notes, and research reports from previous studies. The data collection method in this study uses a literature review. A Literature review is a research technique that involves collecting, evaluating, and analyzing various sources of information related to a specific topic (Budianto &

Dewi, 2023). Data sources from research are based on the internet, such as e-books and online journals (2020-2024). The data source in this study is secondary data. The data obtained and selected according to the established criteria will be used for analysis. The research thoroughly examines existing literature, emphasizing analyzing data collection methods, data reduction techniques, and the conclusion-making process. This study also uses the PRISMA. PRISMA is a tool and guide used to conduct systematic assessments. The keywords used in this research are Artificial Intelligence and Economics Subjects. The first step taken by researchers is to find journals that match their criteria so that in the final result, researchers get 25 journals and then analyze and discuss them in this study.

RESULTS AND DISCUSSION

Various approaches can be taken to use artificial Intelligence in learning. Along with the times, this development requires multiple fields, including education, to adapt and collaborate in solving existing challenges (Hakim, 2022). Artificial intelligence technology is crucial in enhancing a more engaged and participatory learning experience (Susanto, 2023). Ali et al. (2023) state that artificial intelligence in education can be a valuable resource for assisting students in learning. However, it is essential to ensure that AI is consistent with the importance of deep understanding, creativity, and critical thinking required by every student. Based on the 25 journals that have been processed, the results that can be discussed are as follows:

Implementation of Artificial Intelligence in Economic Learning

Some applications of artificial intelligence that can be applied in the field of education include (Bethea & Samanta, 2019): AI Virtual Mentor, AI provides feedback and recommendations on learning materials like a teacher would. Voice Assistant is a well-known AI technology often used in various fields, including education. Smart Content: This AI technology serves to share and find material content and digital books that have been programmed virtually more efficiently and quickly. Presentation Translator: This technology is similar to Voice Assistant, which relies on voice. Global Courses, Simply put, Global Courses allow users or students to search and enroll in online courses from various countries worldwide. This course platform can provide recommendations based on the users' interests and interests according to the keywords they entered earlier. Automatic Assessment: This feature allows teachers to create quizzes and tests quickly and efficiently.

Artificial Intelligence Often Used in Economics Learning

In an educational environment, various AI platforms can support the learning process during college. Here are some AI platforms that are often used: ChatGPT and Perplexity: An AI

platform that can act as a virtual assistant to answer user questions and assist in organizing learning materials (Badruzzaman et al., 2024). DataBot: An AI application that serves as a virtual assistant with features to train logic and memory skills. ELSA Speak: An AI application that assists university students in developing language skills for unitive AI: An AI platform that provides material recommendations for teachers or lecturers. Gradescope is an AI application that helps teachers manage student assignments and automatically provide feedback. Grammarly: An AI application that helps students improve their ability to write correctly (Ali et al., 2023).

The Impact of Artificial Intelligence on Economic Learning

Every change brings inevitable good and bad impacts, and this also applies to the presence of artificial intelligence (AI). Although AI offers convenience, it is also followed by various threats to the continuity of education in Indonesia. The following are some of AI's positive and negative effects: (1) The presence of AI helps improve learning effectiveness and ensures that students get relevant and engaging learning experiences (Rifky, 2024); (2) Learners can experience increased ability in the presence of innovative and adaptive learning prepared by teachers or lecturers with high professionalism (Rifky et al., 2024); (3) By using artificial intelligence (AI) wisely, Indonesia can open the door to a more inclusive and technologically advanced education system, which aims to prepare students for future challenges and opportunities (Yulianti et al., 2023); (4) With its various features, AI has a crucial role in personalizing learning by collecting and analyzing data about learners' individual needs and development (Astutik et al., 2023); (5) The application of Artificial Intelligence in curriculum transformation can increase learning effectiveness, improve education quality, and prepare students with the skills needed to face future changes (Liriwati, 2023). Negative impacts: (1) Excessive use of AI can cause learners to become overly dependent on AI technology (Astutik et al., 2023); (2) The presence of Artificial Intelligence can lead to a decline in children's progress, including in affective, cognitive, and psychomotor aspects (Pongtambing et al., 2023); (3) the presence of AI also presents a high risk to data security, as it is vulnerable to security attacks and may experience data corruption or loss in the future (Nadila & Septiaji, 2023); (4) Students' potential dependency on artificial intelligence may reduce their motivation to search for information and develop independent thinking skills manually (Putri et al., 2023); (5) Artificial intelligence keeps teachers and students busy, requiring additional tasks from trainers, especially in administrative matters (Setiawi et al., 2024).

CONCLUSION

From the results and discussion, it can be concluded that Based on the research results, artificial intelligence applications that can be applied in economic learning are AI Virtual

Mentors, Voice Assistants, Smart Content, Presentation Translators, Global Courses Automatic Assessment, and Personalized Learning. In learning economics, various artificial intelligence platforms, such as ChatGPT and Perplexity, DataBo, ELSA Speak, Formative AI, Gradescope Grammarly, and PowerPoint, can support the learning process during college. Although AI offers convenience in economic learning, it is also followed by various threats to the continuity of education in Indonesia through positive and negative impacts.

ACKNOWLEDGEMENT

The authors would like to thank the research team for collaborating in completing this article.

REFERENCES

Ali, N., Hayati, M., Faiza, R., & Khaerah, A. (2023). Artificial intelligence (AI) in Islamic Education: Trends, perceptions, and potential academic violations among students. *INJIRE: Indonsian Journal of Islamic Religious Education*, *1*(1), 51–66.

Arly, A., Dwi, N., & Andini, R. (2023). Implementation of the use of artificial intelligence in the learning process of communication science students in class A. *Prosiding Seminar Nasional*, *2*, 362–374.

Astutik, E. P., Ayuni, N. A., & Putri, A. M. (2023). Artificial intelligence: The impact of the shifting utilization of human intelligence with artificial intelligence for education in Indonesia. *Sindoro Cendikia Pendidikan*, *1*(1), 101–112.

Badruzzaman, A., Mamun, S., & Fauzi, A. (2024). Introduction and application of artificial intelligence in improving teacher competence at Qur'anic Boarding School Al -Lathifah Cikarang Barat. *Jurnal Pelita Pengabdian*, *2*(1), 53–59.

Bethea, A., & Samanta, D. (2019). The role of artificial intelligence (AI) to support learning during the Covid-19 pandemic. *Critical Care Medicine*, *47*(1), Article 508. https://doi.org/10.1097/01.ccm.0000551807.92236.e2

Budianto, E. W. H., & Dewi, N. D. T. (2023). The effect of book value per share (BVS) on islamic and Conventional Financial Institutions: VOS viewer bibliometric study and literature review. *2*(1), 108–116.

Hakim, L. (2022). *The role of artificial intelligence in education*. Kementerian Pendidikan Dasar dan Menengah. https://ppg.kemdikbud.go.id/news/peranan-kecerdasan-buatan-artificial-intelligence-dalam-pendidikan.

Lim, E. M. (2023). Metaphor analysis on pre-service early childhood teachers' conception of AI (Artificial Intelligence) education for young children. *Thinking Skills and Creativity, 51,* Article 101455. https://doi.org/10.1016/j.tsc.2023.101455

Nadila, D., & Septiaji, A. (2023). Implementation of Artificial intelligence in independent learning in the humanities field. *Prosiding Seminar Nasional Pendidikan, 5*(5), 100-104.

Pongtambing, Y. S., Appa, F. E., Siddik, A. M. A., Sampetoding, E. A. M., Admawati, H., Purba, A. A., Sau, A., & Manapa, E. S. (2023). Peluang dan tantangan kecerdasan buatan bagi generasi muda [Opportunities

and challenges of artificial intelligence for the young generation]. *Bakti Sekawan : Jurnal Pengabdian Masyarakat*, *3*(1), 23–28. https://doi.org/10.35746/bakwan.v3i1.362

Putri, A. N., & Hasan, M. A. K. (2023). Application of artificial intelligence as Arabic language learning media in the era of society 5.0. *Tarling : Journal of Language Education*, *7*(1), 69–80. https://doi.org/10.24090/tarling.v7i1.8501

Putri, V. A., Carissa, K., Sotyawardani, A., & Rafael, R. A. (2023). The role of artificial intelligence in the student learning process at Surabaya State University. *Prosiding Seminar Nasional, 2,* 615–630.

Rifky, S. (2024). Dampak penggunaan artificial intelligence bagi pendidikan tinggi [The impact of artificial intelligence on higher education]. *Indonesian Journal of Multidisciplinary on Social and Technology*, *2*(1), 37-42. https://doi.org/10.31004/ijmst.v2i1.287

Rifky, S., Paling, S., Arifudin, O., & Narayanti, P. S. (2024). Professionalism of educators in learning development. *International Journal of Teaching and Learning*, *2*(2), 579–588.

Ririh, K. R., Laili, N., Wicaksono, A., & Tsurayya, S. (2020). Studi komparasi dan analisis swot pada implementasi kecerdasan buatan (Artificial Intelligence) di Indonesia [Comparative Study and SWOT Analysis on Artificial Intelligence Implementation in Indonesia]. *Jurnal Teknik Industri*, *15*(2), 122–133. https://doi.org/10.14710/jati.15.2.122-133

Sandy, F., Palangi, W. A., Liling, D., & Pratama, M. P. (2023). Impelentasi Penggunaan Kecerdasan Buatan Dalam Pendidikan Tinggi [Implementation of artificial intelligence in higher education]. *Prosiding Universitas Kristen Indonesia Toraja*, *3*(3), 111-117. https://doi.org/10.47178/prosidingukit.v3i3.2295

Sariyasa, S., & Monika, K. A. L. (2023). Artificial intelligence and academic ethics in the era of Merdeka belajar : How are students' responses? *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, *9*(3), Article 986. https://doi.org/10.33394/jk.v9i3.8720

Setiawi, A. P., Nova, E., Patty, S., Rex, S., Making, M., Stella, U., Sumba, M., No, J. P., & Timur, N. T. (2024). The impact of artificial intelligence in High School learning. *Indo-MathEdu Intellectuals Journal*, *5*(1), 680–684.

Stolpe, K., & Hallstr, J. (2024). Artificial intelligence literacy for technology education. *Computers and Education Open Journal*, *6*, Article 100159. https://doi.org/10.1016/j.caeo.2024.100159

Susanto, E. (2023). Analysis of artificial intelligence implementation in learning. *Sindoro: Cendekia Pendidikan*, *1*(8), 101–112.

Yulianti, G., Permana, N., Ayu, F., & Wijayanti, K. (2023). Transforming Indonesian education: Applying the potential of artificial intelligence. *Journal of Information Systems and Management*, *2*(6), 102–106.

Yustiasari Liriwati, F. (2023). Curriculum transformation; Artificial intelligence for building future-relevant education. *Jurnal IHSAN : Jurnal Pendidikan Islam*, *1*(2), 62–71. https://doi.org/10.61104/ihsan.v1i2.61

Zarei, M., Eftekhari Mamaghani, H., Abbasi, A., & Hosseini, M. S. (2024). Application of artificial intelligence in medical education: A review of benefits, challenges, and solutions. *Medicina Clinica Practica*, *7*(2), 7–11. https://doi.org/10.1016/j.mcpsp.2023.100422

Pertanika Proceedings 1 (2): 7 - 11 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Secondary School Teachers' Formative Assessment Competencies in the Digital Environment: A Systematic Review

Amilusholihah*, Susanti Kurniawati, Alfred Liubana and Nani Sutarni

Department of Economics Education, Faculty of Economics and Business Education, Indonesia University of Education, Bandung 40154, Indonesia

ABSTRACT

In an increasingly digitalized educational environment, formative assessment is essential for effective student learning. It is crucial to study teachers' competencies, as their views and beliefs on this issue will greatly impact classroom teaching practices. This research aims to systematically elucidate the assessment competencies of teachers at the secondary school level. In order to address the research questions, guidelines from PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) were employed to systematically identify 15 out of 392 articles, spanning the period from 2020 to 2024, and retrieved from three databases, namely Scopus, WoS, and ERIC, in accordance with the established exclusion and inclusion criteria. The results show that (1) The challenges of effective mastery of formative assessment are limited by inadequate infrastructure, large class sizes, lack of digital training and lack of teacher self-efficacy, (2) Formative assessment enhances teacher competence through proper training and support, improving skills and teaching strategies, and (3) Formative assessments enhance student achievement through feedback, self-regulation, and adaptability. Policymakers are recommended to improve infrastructure, digital training, and support for teachers to optimize digital-based formative assessment.

Keywords: Digital environment, formative assessment, online assessment, secondary school, teachers' competencies

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.002

E-mail addresses:
amilusholihah@upi.edu (Amilusholihah)
susanti.kurniawati@upi.edu (Susanti Kurniawati)
alfredliubana@upi.edu (Alfred Liubana)
nanisutarni@upi.edu (Nani Sutarni)
* Corresponding author

INTRODUCTION

The 21st century brings rapid technological advances, presenting unique education opportunities (Memisevic et al., 2023). Education systems are tasked with preparing students to thrive by developing essential 21st-century skills such as critical thinking, creativity, collaboration, and

communication (Amilusholihah et al., 2024). However, its effectiveness depends on teacher competence, as studies show that formative assessment can improve student understanding and metacognitive abilities (Alt et al., 2023; Leighton, 2019). Despite its benefits, challenges persist, especially in digital formative assessments. Teachers often struggle with understanding and applying these techniques effectively (Khajeloo et al., 2022), with issues such as misconceptions, limited skills, and inadequate facilities (Wolf & Lopez, 2022; Yusof et al., 2022). Although research highlights the potential of digital tools in formative assessment, the impact of teacher competence on its effectiveness remains underexplored. This gap emphasizes the need to investigate how teachers' proficiency in formative assessment and digital tools influences student outcomes.

PROBLEM STATEMENT

The integration of digital formative assessments in education faces challenges due to teachers' limited competence in effectively utilizing them. Despite the recognized benefits of formative assessments in enhancing student learning and supporting personalized instruction, many educators struggle with understanding and implementing these tools effectively (Berisha et al., 2024; Khajeloo et al., 2022). This gap in teacher competence limits the potential of digital formative assessments to improve student achievement. Therefore, this study aims to explore how teacher competence in using digital formative assessments influences student learning outcomes, addressing the need for more effective implementation in education.

RESEARCH QUESTIONS

This study seeks to explore: How does the role of teacher competence in formative assessment affect student achievement supported by digital technology? This study uses a systematic literature review approach by following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines developed by (Liberati et al., 2009). The PRISMA stages are identification, screening, data extraction and eligibility to obtain review articles according to the criteria (which are included). The goal is for researchers to be able to identify and map similar research topics simultaneously (Agrawal et al., 2024). Figure 1 shows the article search process.

Between March 15 and July 10, 2024, a systematic review was conducted using Web of Science, Scopus, and ERIC databases. The review focused on studies from 2020 to 2024, resulting in 144 articles after screening. These studies, examining secondary school teachers' use of formative assessment in digital environments across 13 countries, emphasized the need for professional development. Teachers with higher digital competence, enhanced by formal training, showed improved student outcomes (Garcia et al., 2024; Gisbert-Cervera

et al., 2022). Challenges such as inadequate infrastructure and large class sizes hinder effective implementation (Rahman et al., 2021).

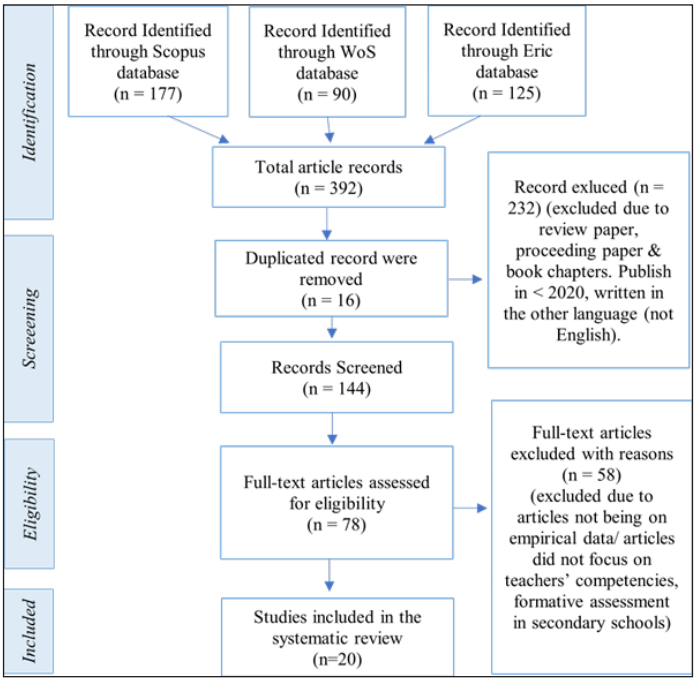

Figure 1. Flow diagram of systematic review process (PRISMA)

CONCLUSION

In conclusion, formative assessment, supported by digital technologies, enhances student achievement and fosters 21st-century skills. Effective implementation by skilled teachers provides valuable feedback for student growth. Prioritizing teacher training and equitable access maximizes its potential for an inclusive education system. However, this study's focus on teachers with high digital competencies limits generalizability, and its secondary school focus restricts broader applicability.

ACKNOWLEDGEMENT

The author expresses gratitude to Lembaga Pengelola Dana Pendidikan (LPDP) for supporting our Master's program.

REFERENCES

Agrawal, S., Oza, P., Kakkar, R., Tanwar, S., Jetani, V., Undhad, J., & Singh, A. (2024). Analysis and recommendation system-based on PRISMA checklist to write systematic review. *Assessing Writing*, *61*, Article 100866. https://doi.org/10.1016/j.asw.2024.100866

Alt, D., Naamati-Schneider, L., & Weishut, D. J. N. (2023). Competency-based learning and formative assessment feedback as precursors of college students' soft skills acquisition. *Studies in Higher Education*, *48*(12), 1901–1917. https://doi.org/10.1080/03075079.2023.2217203

Amilusholihah, A., Sobandi, A., Mulyani, H., & Sutarni, N. (2024). Systematic literature review: Efektivitas model problem-based learning kurikulum merdeka pada pembelajaran ekonomi SMA. *Ideguru: Jurnal Karya Ilmiah Guru*, *9*(3), 1635–1643. https://doi.org/10.51169/ideguru.v9i3.1079

Berisha, F., Vula, E., Gisewhite, R., & McDuffie, H. (2024). The effectiveness and challenges implementing a formative assessment professional development program. *Teacher Development*, *28*(1), 19–43. https://doi.org/10.1080/13664530.2023.2210533

Garcia, E. C., Molins, L. L., & Fuertes-Alpiste, M. (2024). Online assessment practices during the pandemic in secondary schools in Catalonia. *Technology, Pedagogy and Education*, *33*(4), 495-511. https://doi.org/10.1080/1475939X.2024.2342354

Gisbert-Cervera, M., Usart, M., & Lázaro-Cantabrana, J. L. (2022). Training pre-service teachers to enhanced digital education. *European Journal of Teacher Education*, *45*(4), 532–547. https://doi.org/10.1080/02619768.2022.2098713

Khajeloo, M., Birt, J. A., Kenderes, E. M., Siegel, M. A., Nguyen, H., Ngo, L. T., Mordhorst, B. R., & Cummings, K. (2022). Challenges and accomplishments of practicing formative assessment: A case study of college biology instructors' classrooms. *International Journal of Science and Mathematics Education*, *20*(2), 237–254. https://doi.org/10.1007/s10763-020-10149-8

Leighton, J. P. (2019). Students' interpretation of formative assessment feedback: Three claims for why we know so little about something so important. *Journal of Educational Measurement*, *56*(4), 793–814. https://doi.org/10.1111/jedm.12237

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J. P. A., Clarke, M., Devereaux, P. J., Kleijnen, J., & Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: Explanation and elaboration. *BMJ (Clinical Research Edition)*, *339,* Article b2700. https://doi.org/10.1136/bmj.b2700

Memisevic, H., Biscevic, I., Hadzic, S., & Kuduzovic, A. (2023). Exploring current trends in education: A review of research topics in the problems of education in the 21st century journal. *Problems of Education in the 21st Century*, *81*(2), 258–268. https://doi.org/10.33225/pec/23.81.258

Rahman, K. A., Hasan, M. K., Namaziandost, E., & Seraj, P. M. I (2021). Implementing a formative assessment model at the secondary schools: Attitudes and challenges. *Language Testing in Asia*, *11*(1), Article 18. https://doi.org/10.1186/s40468-021-00136-3

Wolf, M. K., & Lopez, A. A. (2022). Developing a technology-based classroom assessment of academic reading skills for English language learners and teachers: Validity evidence for formative use. *Languages*, *7*(2), Article 71. https://doi.org/10.3390/languages7020071

Yan, Z., Chiu, M. M., & Keung Cheng, E. C. (2022). Predicting teachers' formative assessment practices: Teacher personal and contextual factors. *Teaching and Teacher Education*, *114*, 103718. https://doi.org/ https://doi.org/10.1016/j.tate.2022.103718

Yoshida, H., Nishizuka, K., & Arimoto, M. (2023). Examining the process of developing evaluative judgement in Japanese elementary schools—Utilising the co-regulation and evaluative judgement model. *Assessment in Education: Principles, Policy & Practice*, *30*(2), 151–176. https://doi.org/10.1080/0969594X.2023.2193332

Yusof, I. J., Mohamad, S. K., Bello, M., Supie, H. S. M., & Ismail, L. H. (2022). Online formative assessment practices among academics of tertiary education in Sokoto State, Nigeria. *International Journal of Professional Business Review*, *7*(3), e0653. https://doi.org/10.26668/businessreview/2022.v7i3.e653

Pertanika Proceedings 1 (2): 13 - 18 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

An Application of Differentiated Learning Model to Cognitive Development of Elementary School Students

Dhea Ayu Anggraini[1], Dedi Kuswandi[2]*, Muhammad Ramli[3], Shirly Rizki Kusumaningrum[1] and Radeni Sukma Indra Dewi[1]

[1]Universitas Negeri Malang, Basic Education Department, Faculty of Graduate School, 23112, Malang, Indonesia
[2]Universitas Negeri Malang, Educational Technology, Faculty of Education, 23111, Malang, Indonesia
[3]Universitas Negeri Malang, Guidance and Counseling, Faculty of Education, 23123, Malang, Indonesia

ABSTRACT

This research aims to assess differentiated learning on the cognitive development of elementary school students. Because it refers to the child's development in thinking and the ability to provide reason, this research used qualitative methods based on the systematic literature review type. Data was collected through articles in Google Scholar. This literature comes from the results of research around 2020–2023 years. Criteria for the literature review of journals selected using the theme of differentiated learning or differential learning. Based on the systematic literature review results, the application of differentiated learning models improves the cognitive level of elementary school students. Teachers can help each student learn more effectively by using a variety of ideas and methods, help students understand the material better, and perform better in academic assessments. differentiated learning can also help students strengthen critical thinking skills and develop abstract thinking abilities. Thus, differentiated learning can help elementary school students achieve optimal cognitive development, especially in achieving individual learning success. The goal of differentiated learning is to ensure that all students are engaged and have the opportunity to learn well. It is concluded that differentiated learning models can support students' cognitive development, especially in students' learning success.

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.003

E-mail addresses:
dhea.ayu.2321038@students.um.ac.id (Dhea Ayu Anggraini)
dedi.kuswandi.fip@um.ac.id (Dedi Kuswandi)
m.ramli.fip@um (Muhammad Ramli)
shirly.rizki.pasca@um.ac.id (Shirly Rizki Kusumaningrum)
radenisukmaindradewi.pasca@um (Radeni Sukma Indra Dewi)
* Corresponding author

Keywords: Cognitive development, differentiated learning, elementary school students, literature review

INTRODUCTION

Educational success is influenced by internal and external factors such as motivation, readiness, and the learning environment. Each of these factors contributes to the

e-ISSN: 3083-9475

learning process and academic achievements" (Restiani & Fatonah, 2021). Teachers face challenges in addressing diverse student characteristics in a classroom setting" (Ediyanto, 2022). differentiated learning (DL) models cater to these variations, helping to deliver content, develop knowledge, and adapt assessment strategies (Suwartiningsih, 2021; Herwina, 2021). Differentiated learning is learning that accommodates the needs of learners in learning activities.

Research related to differentiated learning is entitled "Implementation of Independent Curriculum in the Application of Differentiated Learning in PAUD Institutions" (Nafisa & Fitri, 2023). This research aims to examine the preparation of differentiated teaching modules, how differentiated learning is implemented, then how teachers identify children's learning characteristics. This is because the implementation of differentiated learning has not been optimal. So teachers face challenges in being able to apply this learning. Therefore, the research that will be carried out this time will focus on the influence of differentiated learning models on the cognitive development of all grade elementary school students. Teachers pay attention to the unique characteristics of different learners so that the same treatment cannot be given between one learner and another learner with different characteristics. In implementing differentiated learning, teachers need to provide reasonable actions in responding to differences in learner characteristics.

PROBLEM STATEMENT

Educational success is influenced by internal and external factors such as motivation, readiness, and the learning environment. Teachers face challenges in addressing diverse student characteristics in a classroom setting. Differentiated learning (DL) models cater to these variations, helping to deliver content, develop knowledge, and adapt assessment strategies.

RESEARCH QUESTIONS

1. How can the implementation of differentiated learning affect the cognitive development of elementary school students?
2. What strategies and techniques in differentiated learning are most effective in enhancing cognitive and abstract thinking skills?
3. In what ways can teachers identify and adapt to students' diverse characteristics and needs to improve their learning outcomes?

This research uses a literature review method. A literature review is an activity that focuses on a particular topic that is interesting for critical analysis of the content being researched (Wahyuni et al., 2022). According to Cooper (1988), the steps in the literature

review are as follows: formulate the problem, collect data, evaluate the eligibility of the data, analyze and interpret relevant data, and organize and present data.

As Tomlinson (2000) outlined, a differentiated learning strategy involves adjusting learning content, processes, and products to cater to students' readiness, interests, and profiles identified through pre-assessments. This approach allows teachers to tailor instruction according to specific student needs and learning styles (Wulandari, 2022), presenting information in various formats suitable for diverse classrooms (Astiti et al., 2021; Pratama, 2022; Suwartiningsih, 2021). By understanding learners' needs, educators can develop effective strategies, create appropriate groups, and improve learning outcomes (Deunk et al., 2018). Differentiation can include customizing materials, providing various instructional methods for different abilities, and allowing students to choose outputs that enhance critical thinking (Desmita, 2013).

According to Piaget, all children progress through four cognitive development stages at different speeds but in the same order (Dahar, 2011). Recognizing the needs of elementary-aged children (7–12 years) is vital since their cognitive development typically falls within the concrete operational stage (Bujuri, 2018). Differentiated learning meets diverse student needs by requiring teachers to consider individual characteristics and tailor responses, aiming to customize learning experiences for improved outcomes through strategies like project-based learning. Tomlinson (2013) emphasizes three key perspectives on learner diversity: readiness, interest, and learning profile, which are essential for tailoring lessons effectively in a supportive classroom environment that fosters acceptance and collaboration (Iskandar, 2021). Teachers should also identify students needing assistance and provide a welcoming learning atmosphere (Faiz et al., 2022). Understanding cognitive development is crucial for designing educational activities that improve students' problem-solving and information-processing skills (Astiti et al., 2021; Bujuri, 2018; Juwantara, 2019). By identifying learners' needs, educators can develop differentiated learning strategies according to their learning needs. Educators can form groups to organize differentiated learning based on characteristics or learning needs of interest or readiness (Smale-Jacobse dkk., 2019). Differentiated learning strategies can have a positive impact if incorporated well into teaching and learning (Deunk dkk., 2018).

Differentiated learning does not mean giving different treatment to each learner or differentiating between smart and less smart learners. (Wahyuningsari dkk., 2022). In other words, differentiated learning is an effort to make customize learning experiences to meet the unique needs of each learner, so that they can achieve better learning outcomes. One of the importance of differentiated learning according to Tucker (Gusteti & Neviyarni, 2022) is to provide opportunities for learners to become peer tutors for other learners. In Tomlinson's (2005) book, How To Differentiate Instruction In Mixed Ability Classrooms, it is known that content differentiation is related to what you want to teach or what you want

learners to learn. There are two ways to differentiate content by customizing the material or modifying the way the teacher gives learners access to the material to be learned.

According to Zega and Suprihati (2021), with the stages of cognitive development above, children's cognitive development includes progressive learning processes such as attention, memory and logical thinking. The development of cognitive skills is often attributed to genetic factors, but much of it can actually be learned. The ability to think and learn can be improved with practice or the provision of the right stimulus. A child's brain develops as it gains new experiences, and this is usually reflected in what the child can do now.

CONCLUSION

Differentiated learning enhances the cognitive development of elementary students by providing personalized educational experiences. This model equips teachers with strategies to support varied learning needs, fostering improved academic performance and critical thinking. Future studies should explore practical implementations and the development of supportive teaching materials.

ACKNOWLEDGEMENT

The authors sincerely thank Universitas Negeri Malang for supporting this research and acknowledge the guidance from mentors, as well as the patience and efforts of the participating students and teachers. This work would not have been possible without their support.

REFERENCES

Astiti, K. A., Supu, A., Sukarjita, I. W., & Lantik, V. (2021). Pengembangan bahan ajar IPA terpadu tipe connected berbasis pembelajaran berdiferensiasi pada materi lapisan bumi kelas VII [Development of connected type integrated science teaching materials based on differentiated learning on earth layer material grade VII]. *Jurnal Pendidikan dan Pembelajaran Sains Indonesia (JPPSI), 4*(2), 112–120. https://doi.org/10.23887/jppsi.v4i2.38498

Bujuri, D. A. (2018). Analisis perkembangan kognitif anak usia dasar dan implikasinya dalam kegiatan belajar mengajar [Analysis of cognitive development of primary-age children and its implications in teaching and learning activities]. *Literasi: Jurnal Ilmu Pendidikan*, *9*(1), 37-50. https://doi.org/10.21927/literasi.2018.9(1).37-50

Cooper, H. M. (1988). Organizing knowledge syntheses: A taxonomy of literature reviews. *Knowledge in Society, 1*(1), 104–126. https://doi.org/10.1007/BF03177550

Dahar, R. W. (2011). *Teori Belajar dan Pembelajaran* [A Study of Learning and Learning Theory]. Penerbit Erlangga.

Desmita. (2013). *Psikologi Perkembangan* [Developmental Psychology]. PT Remaja Rosdakarya.

Deunk, M. I., Smale-Jacobse, A. E., De Boer, H., Doolaard, S., & Bosker, R. J. (2018). Effective differentiation Practices: A systematic review and meta-analysis of studies on the cognitive effects of differentiation practices in primary education. *Educational Research Review, 24*, 31-54. https://doi.org/10.1016/j.edurev.2018.02.002

Ediyanto. (2022). Pemetaan kebutuhan belajar berdasarkan gaya belajar peserta didik [Mapping learning needs based on students' learning styles]. *Seminar Nasional Teknologi dan Multidisiplin Ilmu (SEMNASTEKMU), 2*(2), 322–340. https://doi.org/10.51903/semnastekmu.v2i1.187

Faiz, A., Pratama, A., & Kurniawaty, I. (2022). Pembelajaran berdiferensiasi dalam program guru penggerak pada modul 2.1 [Differentiated learning in the driving teacher program in module 2.1.]. *Jurnal Basicedu, 6*(2), 2846–2853. https://doi.org/10.31004/basicedu.v6i2.2504

Gusteti, M. U., & Neviyarni, N. (2022). Pembelajaran berdiferensiasi pada pembelajaran matematika di kurikulum Merdeka [please provide translation title in English]. *Jurnal Lebesgue: Jurnal Ilmiah Pendidikan Matematika, Matematika dan Statistika, 3*(3), 636–646. https://doi.org/10.46306/lb.v3i3.180

Herwina, W. (2021). Optimalisasi kebutuhan murid dan hasil belajar dengan pembelajaran berdiferensiasi [Optimizing student needs and learning outcomes with differentiated learning]. *Perspektif Ilmu Pendidikan, 35*(2), 175–182. https://doi.org/10.21009/PIP.352.10

Iskandar. (2021). *Menghadapi Pembelajaran Abad 21*. Literasia Lintas Media.

Juwantara, R. A. (2019). Analisis teori perkembangan kognitif piaget pada tahap anak usia operasional konkret 7-12 tahun dalam pembelajaran matematika [Analysis of Piaget's cognitive development theory at the stage of concrete operational children 7-12 years old in learning mathematics]. *Al-Adzka: Jurnal Ilmiah Pendidikan Guru Madrasah Ibtidaiyah, 9*(1), 27-34. https://doi.org/10.18592/aladzkapgmi.v9i1.3011

Nafisa, M. D., & Fitri, R. (2023). Implementasi kurikulum merdeka dalam penerapan pembelajaran berdiferensiasi di lembaga PAUD [Implementation of the Independent Curriculum in Implementing Differentiated Learning in PAUD Institutions]. *Jurnal Studi Guru dan Pembelajaran, 6*(2), 179–188. https://doi.org/10.30605/jsgp.6.2.2023.2840

Pratama, A. (2022). Strategi pembelajaran berdiferensiasi meningkatkan kemampuan literasi membaca pemahaman siswa [Differentiated learning strategy improves students' reading comprehension literacy skills]. *Jurnal Didaktika Pendidikan Dasar, 6*(2), 605–626. https://doi.org/10.26811/didaktika.v6i2.545

Restiani, S. Y., Ismah, I., & Fatonah, E. (2021, October 28). *Analisis faktor pendukung keberhasilan pemenang kompetisi matematika di smp Al-Fath Cirendeu* [Analysis of factors supporting the success of math competition winners at SMP Al-Fath Cirendeu]. [Paper presentation]. Seminar Nasional Pengabdian Masyarakat, Jakarta Indonesia.

Smale-Jacobse, A. E., Meijer, A., Helms-Lorenz, M., & Maulana, R. (2019). Differentiated instruction in secondary education: A systematic review of research evidence. *Frontiers in Psychology, 10*, Article 2366. https://doi.org/10.3389/fpsyg.2019.02366

Suwartiningsih, S. (2021). Penerapan Pembelajaran berdiferensiasi untuk meningkatkan hasil belajar siswa pada mata pelajaran IPA pokok bahasan tanah dan keberlangsungan kehidupan di kelas IXb semester genap SMPN 4 monta tahun pelajaran 2020/2021 [Application of differentiated learning to improve student learning outcomes in the science subject of soil and the sustainability of life in class IXB semester

of SMPN 4 monta in the 2020/2021 academic year]. *Jurnal Pendidikan dan Pembelajaran Indonesia (JPPI), 1*(2), 80–94. https://doi.org/10.53299/jppi.v1i2.39

Tomlinson, C. A. (2000). *Differentiation of Instruction in the Elementary Grades*. ERIC Digest.

Tomlinson, C. A. (2005). *How to Differentiate Instruction in Mixed-Ability Classrooms* (2nd ed.). Association for Supervision & Curriculum Development.

Tomlinson, C. A. (2013). *Assessment and Student Success in a Differentiated Classroom*. ASCD.

Wahyuningsari, D., Mujiwati, Y., Hilmiyah, L., Kusumawardani, F., & Sari, I. P. (2022). Pembelajaran berdiferensiasi dalam rangka mewujudkan merdeka belajar [Differentiated learning in order to realize independent learning]. *Jurnal Jendela Pendidikan, 2*(04), 529–535. https://doi.org/10.57008/jjp.v2i04.301

Wulandari, A. S. (2022). Literature review: Pendekatan berdiferensiasi solusi pembelajaran dalam keberagaman [Literature review: Differentiated approach to learning solutions in diversity]. *Jurnal Pendidikan MIPA, 12*(3), 682–689. https://doi.org/10.37630/jpm.v12i3.620

Zega, B. K., & Suprihati, W. (2021). Pengaruh perkembangan kognitif pada anak [Influence of cognitive development in children]. *Veritas Lux Mea (Jurnal Teologi dan Pendidikan Kristen), 3*(1), 17–24. https://doi.org/10.59177/veritas.v3i1.101

Pertanika Proceedings 1 (2): 19 - 25 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Representation of Reading Literacy in Higher Education as Digital Learners

Arjulayana[1]*, Tri Pujiati[2], Nasikhatul Ulla Al Jamiliyati[3], Lukmanul Hakim[4] and Roveneldo[4]

[1]English education department, Universitas Muhammadiyah Tangerang, Banten, Indonesia
[3]Social Science Department, Universitas Trunojoyo, Madura, Indonesia
[2]Social Science Department, Universitas Merdeka, Malang, Indonesia
[4]Language preservation research, National Research and Innovation Agency-BRIN, Indonesia

ABSTRACT

Reading literacy for university students still needs to be advocated due to their contribution, as digital learners are very demanding through involving comprehensive understanding and reading information digitally. This paper aims to find out and represent university students' reading literacy in their responses as digital learners because university students need a clear understanding of information to contribute well in the digital era and to understand how students can analyze digital information and engage with digital content effectively. This qualitative descriptive research used some research instruments such as observation, interview, and documentation. The sample of this research was 2nd semester students of Universitas Muhammadiyah Tangerang, with a total sample of 31 students. The observation is done at the beginning to gain students' reading literacy after utilizing the digital platform. The interview was used to find out the students' reading literacy during the spot time, and the last was documentation; the documentation used some digital platforms that contained information. The data were analyzed based on PISA 2018 indicators. This research found that university students' reading literacy can be divided into three levels: high, medium, and low levels of reading literacy students. Besides, the representation of reading literacy also shows that there has been a significant increase over time. This is due to students' awareness of continuing to foster their reading skills and habits.

Keywords: Digital learners, digital, literacy, reading literacy

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.004

E-mail addresses:
arjulayana@umt.ac.id (Arjulayana)
tri.pujiati@trunojoyo.ac.id (Tri Pujiati)
dennysatyabrata@gmail.com (Nasikhatul Ulla Al Jamiliyati)
lukm010@brin.go.id (Lukmanul Hakim)
roveneldo@brin.go.id (Roveneldo)
* Corresponding author

INTRODUCTION

Digital learners can connect with individuals from around the world. They can engage in

cross-cultural learning experiences, collaborate on international projects, and gain a global perspective, which is increasingly important in our interconnected world. Meanwhile, digital learners need to adapt rapidly to understand technological landscapes (Tan & McWilliam, 2009). Students can be comfortable with ever-evolving digital tools and platforms to gain information and improve their reading literacy digitally.

Furthermore, as one of the fundamental skills, students' reading literacy is really advocated for, and it should be fostered by university students as digital learners are the core of the bright future in education, professional endeavors, and everyday life. It enables individuals to access information, think critically, and communicate effectively (Ebert & Weinert, 2013; Horarik et al., 2018). As technology and how we consume information continue to evolve, digital literacy has become increasingly important alongside traditional reading literacy, as individuals need to navigate and understand digital texts and multimedia content (Akbar, 2014).

Hence, some of the concepts of reading literacy representation could be seen based on The ability to recognize and sound out words accurately, called decoding, Understanding the meaning of the text, including grasping main ideas, identifying supporting details, and making inferences based on the information presented called comprehension ability, Having a strong and diverse vocabulary to understand and interpret the meanings of words in context, and Drawing connections between different parts of the text, making predictions, and forming interpretations (Ebert & Weinert, 2013).

Indonesian University students' problems related to reading literacy can vary due to their difficulties in reading and understanding texts, especially in English (Mayuni et al., 2020). This limited reading literacy can hinder their ability to understand academic material, especially if most of the teaching materials are in EFL (Lawhon, 1976). Besides having a Low interest in reading among college students, Many college students prefer to spend their time on social media, entertainment, or other activities, which strongly lowers their critical thinking and comprehension skills (Al-Zidjaly, 2019).

Otherwise, digital Learners may have basic reading skills, but it looks like they lack the ability to analyze the text in depth. So, this research will investigate digital learners reading literacy to cover the representation of reading literacy among digital learners. The research question is limited to (1) how the digital learner's reading literacy is implemented in university and (2) how the representation of students' reading literacy as digital learners is investigated clearly.

MATERIALS AND METHOD

The research method used in this paper is Qualitative descriptive. The purposive sampling was 31 students from the second-semester class of Universitas Muhammadiyah Tangerang; this class belongs to middle-aged university students who still need to adapt to their

condition and schedule to complete any kind of academic tasks and university organization. The research instrument consists of observation, interview, and documentation. For observation, the researcher carries out some observation forms to observe students' reading interests and social conditions.

The observation is used to measure students' understanding of their self-condition related to the aspect of reading literacy indicators, such as readiness in reading and understanding the reading strategy (Ho & Lau, 2018). The second instrument was an interview with 10 questions through ordinal scale analysis to find out the level of students' awareness of reading literacy and their preferences. The last instrument is documentation. The researcher gives some texts to the sample, and they need to read the text and then represent their understanding through an oral presentation to gain their text's understanding in-depth.

The data analysis refers to three dimensions of reading literacy assessment proposed by PISA 2018 (OECD, 2018): (1) Text: related to the type of reading materials that students often read, texts in print, such as magazines, newspapers, or online texts, (2) Aspects: related to the reading process involving cognitive skills, and (3) Situations: This aspect is closely related to the context of the text, how the text is constructed, whether there are personal matters, such as biographies, or about academic texts, or perhaps about social events in society (OECD, 2018; Sen et al., 2019).

RESULT AND DISCUSSION

Concerning the data analysis based on reading literacy observation, interview, and documentation, the data can be elaborated on based on the limitations of the problems.

University Student's Reading Literacy Process as a Digital Learner

Based on the data obtained, EFL undergraduate students of the University of Muhammadiyah Tangerang understood the importance of reading in improving reading literacy. This is evidenced by the representation of 82% of the sample who strongly agree that reading literacy is a basic skill, and as digital learners, they need to improve their reading literacy to understand information clearly. 0.5% of students are neutral; it seems those students could not find the motivation to learn or utilize any platform to improve their skills (Ismawati et al., 2023; Miles & Fletcher, 2023; Pratiwi, 2019). On the other side, 13% doubted their understanding of reading literacy, and the rest, 4.5%, disagreed that reading literacy is the most fundamental aspect of gaining others' literacy, as digital learners prefer to use social platforms for speaking literacy or finding information virtually.

Furthermore, when students' reading skills are improved, they will have good reading habits and do their reading properly. Since their reading habit is improved, they will be aware of three dimensions of reading literacy (Thomson et al., 2013): where they can find

the resources to enhance their knowledge, utilize any kind of online platform to boost their reading literacy; they will gain their own strategy to understand the text, can find any kinds of reading construction based on their preference with the objective to improve their reading literacy (Morrell, 2014; Sen et al., 2019; Zashchitina & Moysyak, 2017).

The Representation of Students' Reading Literacy as a Digital Learner

The data of student reading literacy assessed consists of three basic domains: (1) text, (2) aspect, and (3) situation (Thomson et al., 2013). Those three dimensions are strongly related to reading and literacy, which need the process of high-order thinking skills (Damaianti et al., 2020). The basic things that students should know are about their understanding of the importance of reading literacy, and most of them understand reading literacy in line with their awareness of reading and skills as digital learners (Becker, 2021; Dewi, 2020).

Before evaluating students' reading literacy to gain representation, the need to know and understand what reading literacy is is crucial. 83.9% of students know that reading literacy is one of the fundamental skills in this digital era. Otherwise, students' reading literacy will improve over time because they know the importance of that skill (Elsner, 2011). While 0.5% of students have a known understanding of reading literacy and its importance, reading literacy still becomes one of the problems for Indonesian students. Nevertheless, university students are no longer beginning readers. Otherwise, their reading literacy would be easier to advocate for.

This research uses the PISA (Program for International Students Assessment to evaluate reading literacy because The Program for International Student Assessment (PISA) has become a widely recognized and influential barometer for evaluating reading literacy, as well as other skills in mathematics and science (Mayuni et al., 2020). PISA is an international assessment conducted by the Organization for Economic Co-operation and Development (OECD, 2018). It evaluates the performance of students from a wide range of countries and regions, making it a global benchmark for education quality and reading literacy. The global scope allows for cross-country comparisons and the identification of trends and disparities in reading proficiency (Koyuncu & Fırat, 2020; Linnakyla et al., 2004). Otherwise, evaluating reading literacy through the PISA indicator is strongly matched due to the standardized assessment methods and questions that are carefully developed well by the expert and tested to measure students' reading literacy. It ensures the assessment is consistent and comparable across different countries, cultures, and languages.

Hence, reading literacy cannot be fully assessed by a single test and by a single level of student literacy (Damaianti et al., 2020). Therefore, PISA should be considered one of several tools to evaluate educational outcomes and should be used in conjunction with other assessments and evaluations to provide a comprehensive view of education quality (OECD, 2018). Hence, this research data shows that students who have good critical

thinking skills will have good reading literacy because they are really familiar with the analysis of the text (Kaur & Sidhu, 2014) and represent students reading literacy. Medium level 60 to 70 score has a medium level of reading literacy related to their cognitive skill in representing their understanding and context analysis. The other level is low-level students, and only 20% are not motivated to utilize any platform to foster their reading literacy. At this level, students have difficulties understanding the text and the context and involving their cognition properly, such as gaining their own strategy to analyze the text (Linnakyla et al., 2004).

ACKNOWLEDGEMENT

The authors sincerely thank to Universitas Muhammadiyah Tangerang for supporting this research and acknowledge the guidance from mentors, as well as the patience and efforts of the participating students and teachers. This work would not have been possible without their support.

CONCLUSION

Based on the results and data analysis from the research that focuses on the reading literacy of 2nd-semester students at the University of Muhammadiyah Tangerang, several things related to literacy, such as understanding the text and context, the cognitive aspects of students and situations, where the students grow and develop, and from the family environment that has what kind of educational background are become the limit of this research.

In conclusion, the representation of students' reading literacy shows a significant improvement over time. This is due to students' awareness of continuing to improve reading skills and habits. Because, as a digital generation, they have realized there are many platforms that they can use to improve their reading literacy as digital learners, they are also aware that having a cognitive strategy in understanding reading is a good trick to improve reading literacy because reading literacy does not distinguish between female and male.

REFERENCES

Akbar, F. (2014). The role of reading in improving speaking skill in the context of teaching English as a foreign language. *International Journal of English Language & Translation Studies*, *2*(4), 92-98.

Al-Zidjaly, N. (2019). Society in digital contexts: New modes of identity and community construction. *Multilingua*, *38*(4), 357–375. https://doi.org/10.1515/multi-2018-0042

Becker, G. S. (2021). 8. A theory of social interactions. In *Accounting for Tastes*. Harvard University Press. https://doi.org/10.4159/9780674020658-009

Damaianti, V. S., Abidin, Y., & Rahma, R. (2020). Higher order thinking skills-based reading literacy assessment instrument: An Indonesian context. *Indonesian Journal of Applied Linguistics*, *10*(2), 513–525. https://doi.org/10.17509/ijal.v10i2.28600

Dewi, F. (2020). Augmented reality for young learners. In *Technology Enhanced Language Learning* (pp. 4-8). UIK Press.

Ebert, S., & Weinert, S. (2013). Predicting reading literacy in primary school: The contribution of various language indicators in preschool. In E. Pfost, C. Artelt & S. Weinert (Eds.) *The Development of Reading Literacy from Early Childhood to Adolescence* (pp.93-149). University of Bamberg Press.

Elsner, D. (2011). Developing multiliteracies, plurilingual awareness & critical thinking in the primary language classroom with multilingual virtual talkingbooks. *Encuentro*, *20*, 27–38.

Ho, E. S. C., & Lau, K. ling. (2018). Reading engagement and reading literacy performance: Effective policy and practices at home and in school. *Journal of Research in Reading*, *41*(4), 657–679. https://doi.org/10.1111/1467-9817.12246

Horarik, M. M., Devereux, L., Jack, C. T., & Wilson, K. (2018). Negotiating the territory of tertiary literacies: A case study of teacher education. *Linguistics and Education Journal*, *53*(1), 1689–1699. https://doi.org/10.1017/CBO9781107415324.004

Ismawati, E., Hersulastuti, Amertawengrum, I. P., & Anindita, K. A. (2023). Portrait of education in Indonesia: Learning from PISA results 2015 to present. *International Journal of Learning, Teaching and Educational Research*, *22*(1), 321–340. https://doi.org/10.26803/ijlter.22.1.18

Kaur, S., & Sidhu, G. K. (2014). Evaluating the critical literacy practices of tertiary students. *Procedia - Social and Behavioral Sciences*, *123*, 44–52. https://doi.org/10.1016/j.sbspro.2014.01.1396

Koyuncu, İ., & Fırat, T. (2020). Investigating reading literacy in PISA 2018 assessment. *International Electronic Journal of Elementary Education*, *13*(2), 263–275. https://doi.org/10.26822/iejee.2021.189

Lawhon, D. (1976). Instructional development for training teachers of exceptional children: A sourcebook. *Journal of School Psychology*, *14*(1), 75. https://doi.org/10.1016/0022-4405(76)90066-2

Linnakyla, P., Malin, A., & Taube, K. (2004). Factors behind low reading literacy achievement. *Scandinavian Journal of Educational Research*, *48*(3), 231–249. https://doi.org/10.1080/00313830410001695718

Mayuni, I., Leiliyanti, E., Agustina, N., Yulianti, V., Chen, Y., & Chu, F. I. (2020). School literacy movement and its implications towards students' learning: A comparative case study in Jakarta and Taiwan. *International Journal of Advanced Science and Technology*, *29*(4 Special Issue), 1555–1569.

Miles, K. P., & Fletcher, A. (2023). Improving vulnerable populations' emergent reading outcomes by training preservice teachers in an evidence-based program. *Journal of Research in Childhood Education*, *37*(3), 442–462. https://doi.org/10.1080/02568543.2023.2211645

Morrell, E. (2014). Toward a critical model of teacher learning: Lessons from the South Carolina Reading Initiative. *Reading & Writing Quarterly*, *30*(3), 207-210. https://doi.org/10.1080/10573569.2014.907715

OECD. (2018). *PISA 2018 Draft analytical Frameworks*. *OECD*

Pratiwi, I. (2019). Efek program pisa terhadap kurikulum di Indonesia [Effects of the PISA Programme on The Curriculum in Indonesia]. *Jurnal Pendidikan Dan Kebudayaan*, *4*(1), 51-71. https://doi.org/10.24832/jpnk.v4i1.1157

Pratiwi, N., Rahayu, N., & Budiani, D. (2021). Penggunaan strategi metakognitif mahasiswa program studi pendidikan bahasa jepang fkip Universitas Riau [please provide translation title in English]. *Jurnal Pendidikan Bahasa Jepang Undiksha*, *7*(3), 275-284.

Pratiwi, S. H. (2021). Upaya meningkatkan literasi membaca di masa pandemi melalui kegiatan seminggu sebuku [please provide translation title in English]. *Fitrah*, *3*(1), 27–48.

Sen, A., Mai, T., Kastberg, D., Cummings, L., & Perkins, R. (2019). Highlights of U.S. PISA 2018 Results Web Report. National Center for Educational Statistics, 1–64.

Tan, J. P. L., & McWilliam, E. (2009). From literacy to multiliteracies: Diverse learners and pedagogical practice. *Pedagogies: An International Journal*, *4*(3), 213–225. https://doi.org/10.1080/15544800903076119

Thomson, S., De Bortoli, L., & Buckley, S. (2013). *How Australia Measures up the PISA 2012 Assessment Of Students' Mathematical, Scientific and Reading Literacy*. Australian Council for Education Research.

Zashchitina, G., & Moysyak, N. (2017). Part 8 key directions and characteristics of research organization in the contemporary world some aspects of developing background knowledge in second language acquisition revisited. In *Current Business and Economics Driven Discourse and Education: Perspectives from Around the World* (pp. 268-270). BCES

Pertanika Proceedings 1 (2): 27 - 31 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Project Learning in Improving Critical Thinking Skills and Learning Outcomes of Elementary School Students

Fathul Jannah[1]*, Reja Fahlevi[2], Raihanah Sari[3], Radiansyah[4] and Muhammad Zefri[5]

Primary Teacher Education, Faculty of Teacher Training and Education, Lambung Mangkurat University, Banjarmasin 70123, Indonesia

ABSTRACT

This research is motivated by the demands of 21st-century learning, which require students to develop skills such as communication, collaboration, critical thinking, problem-solving, creativity, and innovation. These skills are categorized as higher-order thinking skills (HOTS). Critical thinking and creativity, in particular, are crucial components of effective learning in schools. Therefore, evaluation tools must be designed to measure students' higher-order thinking abilities, encouraging them to utilize their HOTS. However, the current evaluation tools used at the elementary school level do not sufficiently measure critical and creative thinking skills. As a result, there is a need for innovation in developing evaluation tools to support HOTS-based Project Learning in elementary schools. This study is descriptive qualitative research. The findings indicate that the project learning evaluation tool developed is effective as an assessment instrument, capable of measuring higher-order thinking abilities, including critical and creative thinking skills, with significant improvements observed in these areas.

Keywords: Critical thinking skill, evaluation tool, hots, project learning

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.005

E-mail addresses:
fathul.jannah@ulm.ac.id (Fathul Jannah)
reja.fahlevi@ulm.ac.id (Reja Fahlevi)
raihanah.sari@ulm.ac.id (Raihanah Sari)
radiansyah@ulm.ac.id (Radiansyah)
mzefri2002@gmail.com (Muhammad Zefri)
* Corresponding author

INTRODUCTION

Elementary environmental schools are ideal for developing higher-order thinking skills (HOTS) because students at this age benefit from learning through direct experiences and interactions with their surroundings. However, the challenge lies in the lack of appropriate evaluation tools that accurately measure students' HOTS abilities in these settings. The current tools do not adequately

e-ISSN: 3083-9475

assess students' critical and creative thinking in project-based learning contexts. Therefore, there is a pressing need to develop an evaluation tool specifically designed for HOTS-based Project Learning in elementary schools.

The Project Learning model was created to focus on developing students' critical and creative thinking abilities (Radiansyah et al., 2022). So that this model can be implemented more effectively, learning tools consisting of lesson plans, teaching materials, media, and evaluation tools are needed. It is very important to develop evaluation tools to support the HOTS-based Project Learning model.

The reality in the field is not as expected because the existing evaluation tools are still not HOTS-based; the existing evaluation tools are not able to measure students' critical and creative thinking abilities (Jannah et al., 2022). Based on these problems, researchers are trying to develop an evaluation tool that is very necessary for implementing HOTS-based Project Learning in elementary schools with the aim of producing an assessment instrument that is able to measure high-level thinking abilities (HOTS), producing an assessment instrument that is able to measure critical and creative thinking abilities student (Omanda et al., 2023).

METHOD

The research method used is descriptive qualitative. The research took place at Pemurus Dalam 2 Elementary School, Banjarmasin, using classroom action research (PTK). Data collection was conducted through various sources, including direct observation of classroom events, interviews with key informants, and documentation of activities. Specific instruments used for data collection included structured interview guidelines, observation sheets, and documentation guidelines. These instruments were designed to capture detailed insights from homeroom teachers, school principals, school operators, librarians, and students. The validation of these tools was ensured through pilot testing and expert review, which confirmed the reliability of the instruments in capturing relevant data.

RESULT

Based on the results of the observation data analysis of students' critical thinking skills when carrying out teaching and learning activities using the Project Learning model, Figure 1 shows that students' critical thinking skills increased from meeting 1 to meeting 4.

Students' critical thinking skills when carrying out teaching and learning activities applying the Project Learning model to mathematics subjects have increased at each meeting. They can reach the criteria of being highly skilled. It is, of course, related to the role of educators in developing activities that aim to improve critical thinking skills. The role of educators in stimulating children's critical thinking abilities cannot be separated from learning planning (Haloho, 2023). Creating learning that can develop critical thinking

skills cannot be separated from the material to be studied, nor can creating and processing that material increase students' activity when using their minds to form concepts in the critical thinking process. This activity emphasizes that learning depends not only on how educators teach but also on how educators create.

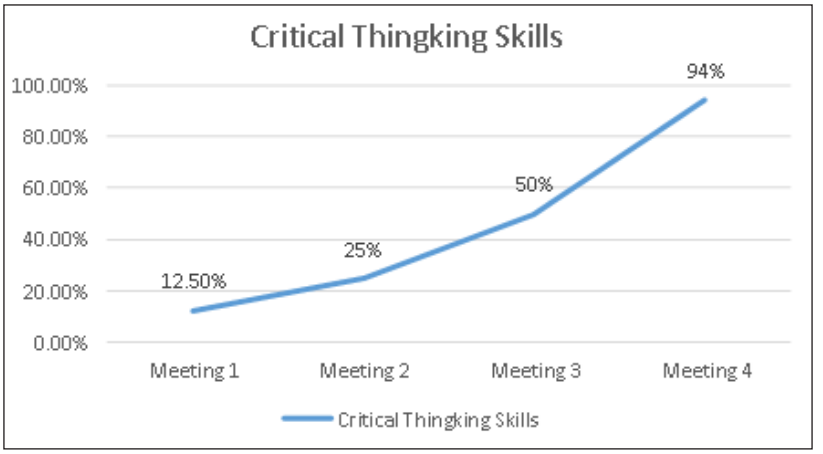

Figure 1. Trend graph of students' critical thinking skills

The first aspect of students' skills in providing simple explanations increases with each meeting. When students are able to explain something simply, it shows that they have understood the concept or information well. The ability to simplify something into easy-to-understand language indicates a deep understanding. Thus, students' ability to explain something simply has broad benefits, not only for their own understanding but also for collective learning, communication, problem-solving, and leadership development (Nurbayani et al., 2021).

The second aspect of students' skills, being able to understand problems from the basics, increases with each meeting. When students are able to understand the problem from the basics, they have a deep understanding of the core of the problem. By understanding the root causes or underlying factors of a problem, they can develop more effective and sustainable solutions. Thus, students' ability to understand problems from the basics significantly benefits decision-making, innovation, problem prevention, and effective solutions. (Nafrin & Hudaidah, 2021).

The third aspect of students' skills in being able to determine strategies and tactics for solving problems increases with each meeting. By being able to determine the right strategy and tactics, students can improve their overall problem-solving abilities. They can develop skills to identify problems, formulate solutions, and implement them more effectively. Thus, students' ability to determine strategies and tactics for solving problems has broad benefits, including increasing problem-solving abilities, efficiency, independence

in learning, developing creativity, and increasing self-confidence. (Munthe & Naibaho, 2019).

The fourth aspect of students' skills is the ability to carry out in-depth problem analysis, which increases with each meeting. By conducting an in-depth problem analysis, students can gain a more comprehensive understanding of the root causes and complexity of the problem. It helps them to recognize aspects that might be missed in a superficial analysis. Thus, students' ability to conduct in-depth problem analysis has broad benefits, including more comprehensive understanding, identification of more effective solutions, prevention of future problems, more accurate decision-making, development of analytical skills, and strengthening critical thinking. (Ritonga et al., 2020).

CONCLUSION

In conclusion, Project Learning has the potential to improve critical thinking skills and student motivation in mathematics learning. Future research should consider expanding this model to other subjects to explore its broader application further. Additionally, combining qualitative and quantitative data with a mixed-method approach could provide deeper insights into the model's effectiveness and impact across different learning contexts.

ACKNOWLEDGEMENT

I extend my deepest gratitude to everyone who contributed to the development of this article. I am particularly thankful to Reja Fahlevi, Raihanah Sari, Radiansyah, and Muhammad Zefri for their valuable insights and guidance throughout the writing process. Special thanks to Lambung Mangkurat University for their unwavering support and encouragement, which motivated me to complete this work. Lastly, I am grateful to the readers for their interest and engagement with this article, as it inspires continued exploration and discussion of the topic.

REFERENCE

Haloho, O. (2023). Peran guru dalam mengembangkan kecerdasan logika anak usia dini [The role of teachers in developing logical intelligence in early childhood]. *Jurnal Pendidikan Dan Konseling (JPDK)*, *5*(2), 7-12. https://doi.org/10.31004/jpdk.v5i2.12504

Jannah, F., Zefri, M., & Fahlevi, R. (2022). Developing student learning activities on the environmental themes of our friends using a combination of the problem solving, S.A.V.I and CRH models in class students V SDN Melayu 2 Banjarmasin. *International Journal of Social Science and Human Research*, *5*(5), 1786–1790. https://doi.org/10.47191/ijsshr/v5-i5-30

Munthe, A. P., & Naibaho, H. P. (2019). Manfaat dan kendala penerapan tutor sebaya untuk siswa kelas IV sekolah dasar lentera harapan mamit [Benefits and obstacles of implementing peer tutoring for fourth grade

students at Lantera Harapan Mamit Elementary School]. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *9*(2), 138–147. https://doi.org/10.24246/j.js.2019.v9.i2.p138-147

Nafrin, I. A., & Hudaidah, H. (2021). perkembangan pendidikan Indonesia di masa pandemi covid-19 [Development of Indonesian education during the Covid-19 pandemic]. *Edukatif : Jurnal Ilmu Pendidikan*, *3*(2), 456–462. https://doi.org/10.31004/edukatif.v3i2.324

Nurbayani, A., Rahmawati, E., Nurfaujiah, I. I., Putriyanti, N. D., Fajriati, N. F., Safira, Y., & Ruswan, A. (2021). Sosialisasi penggunaan aplikasi liveworksheets sebagai LKPD interaktif bagi guru-guru SD Negeri 1 Tegalmunjul Purwakarta [Socialization of the use of the liveworksheets application as an interactive LKPD for teachers at SD Negeri 1 Tegalmunjul Purwakarta]. *Indonesian Journal of Community Services in Engineering & Education (IJOCSEE)*, *1*(2), 126–133. https://doi.org/10.17509/ijocsee.v1i2.33479

Omanda, N., Harahap, F., & Wau, Y. (2023). Development of student worksheets based project based learning to improve high-level thinking skills (Hots) on magnetic material. *Randwick International of Education and Linguistics Science Journal*, *4*(3), 752–757. https://doi.org/10.47175/rielsj.v4i3.805

Radiansyah, R., Sari, R., Jannah, F., Rahmaniah, N. F., Puspita, P. M., & Zefri, M. (2022). HOTS-based PjBL model development to increase children's creativity in elementary school. *International Journal of Social Science And Human Research*, *5*(12), 5810–5816. https://doi.org/10.47191/ijsshr/v5-i12-64

Ritonga, M., Matondang, Y., Miswan, M., & Parijas, P. (2020). Pelatihan penelitian tindakan kelas dalam meningkatkan kompetensi guru Min 1 Pasaman Barat. *Adimas : Jurnal Pengabdian Kepada Masyarakat*, *4*(2), 76-82. https://doi.org/10.24269/adi.v4i2.2106

Pertanika Proceedings 1 (2): 33 - 37 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

The Effectiveness of Game-based Learning Using Kahoot in Teaching Grammar: A Systematic Literature Review

Fitriyani

Yogyakarta State University, English Education Study Program, Faculty of Languages, Arts and Cultures, Daerah Istimewa Yogyakarta 55281, Indonesia

ABSTRACT

Grammar is one of the most significant issues in language teaching and learning and is receiving increased attention. Grammar is crucial in all parts of language acquisition, but most learners still need to enhance their grammatical performance. Many pieces of literature have confirmed that Kahoot is beneficial for teaching English grammar. Kahoot is a game-based learning platform that may be used to assess students' knowledge, conduct formative evaluations, or break away from traditional educational activities. It is a digital media platform with several advantages, including assisting instructors in receiving assessment results more easily and quickly, as well as teaching media and other purposes. However, none of them conducted a systematic literature review to present a comprehensive understanding of using Kahoot in teaching grammar based on prior studies. Therefore, this systematic literature review aims to present how Kahoot is used in the classroom and whether it may be useful for improving students' grammar achievement. The researcher carried out database searches such as Scopus, Web of Science, Sinta, and Google Scholar related to key terms—finally, forty-eight journal articles aligned with the inclusion criteria. The result found that Kahoot was effectively and widely utilized in teaching media and enhanced students' grammar achievement. This study additionally discusses the findings of a research review on the benefits of using Kahoot to learn, specifically how Kahoot Impacts students' grammatical performances.

Keywords: Grammar, game-based learning, Kahoot

INTRODUCTION

This study explores the role of grammar in English language learning, particularly for ESL students. Grammar, as a set of rules governing language structure, is crucial for mastering speaking, writing, reading, and listening skills (Cam & Tran, 2017; Habibi, 2021). Traditional grammar instruction,

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.006

E-mail address:
fitriyani.2023@student.uny.ac.id

often relying on rote learning and limited interaction, can disengage students. In contrast, integrating technology, such as game-based learning (GBL) platforms like Kahoot, makes grammar instruction more dynamic and engaging (Ifenthaler et al., 2018). This study reviews the effectiveness of Kahoot in grammar instruction, aiming to identify benefits, challenges, and strategies for implementation, ultimately improving students' grammar understanding and language skills.

While Kahoot has been widely acknowledged as an engaging educational tool, there remains a gap in the literature regarding its specific impact on grammar instruction and achievement. The majority of existing studies have focused on general language skills or specific educational contexts, but few have comprehensively examined Kahoot's role in enhancing grammar understanding. Moreover, while several studies suggest the benefits of GBL in fostering engagement and motivation (Ifenthaler et al., 2018; Musdalifah et al., 2018), empirical evidence on its effectiveness in improving grammar performance remains underexplored.

This systematic literature review aims to address this gap by synthesizing and evaluating the existing studies on the use of Kahoot in grammar teaching. By focusing on how Kahoot can enhance grammar achievement, this review seeks to provide a comprehensive understanding of the tool's potential in ESL grammar instruction and offer recommendations for its effective implementation.

PROBLEM STATEMENT

Despite grammar's foundational role in language proficiency, traditional teaching methods often fail to engage students, especially in ESL contexts, leading to low motivation and retention. Rote memorization and repetitive drills typically characterize these methods, which do not foster a deep understanding of grammatical rules. In response, digital tools and game-based learning (GBL) platforms, like Kahoot, have emerged as potential solutions to enhance engagement and interactivity in learning. However, limited research exists on Kahoot's specific impact on grammar achievement and its practical advantages in language education. This study aims to fill this gap by exploring Kahoot's effects on grammar achievement, its benefits in educational settings, and the most effective strategies for its implementation in grammar instruction. The findings aim to inform how GBL platforms can improve grammar comprehension, increase student engagement, and enhance language proficiency.

RESEARCH QUESTIONS

1. How does Kahoot affect students' grammar achievement?
2. What are the advantages of using Kahoot?
3. How is Kahoot implemented in learning grammar?

This study conducted a systematic literature review involving a comprehensive analysis of high-quality research related to specific research questions by locating, selecting, synthesizing, and evaluating pertinent literature. As explained by Soyoof et al. (2021), a systematic review aims to provide structured responses to research questions by assessing a focused selection of quality-assessed studies. Additionally, Sarkis-Onofre et al. (2021) emphasized that this process is guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement, an evidence-based set of recommendations designed to promote transparent and thorough reporting of systematic reviews. This framework supports researchers in organizing, conducting, and reporting various types of systematic reviews or meta-analyses. The steps of this review process, including literature selection and synthesis stages, are visually represented in Figure 1 for clearer understanding and reference.

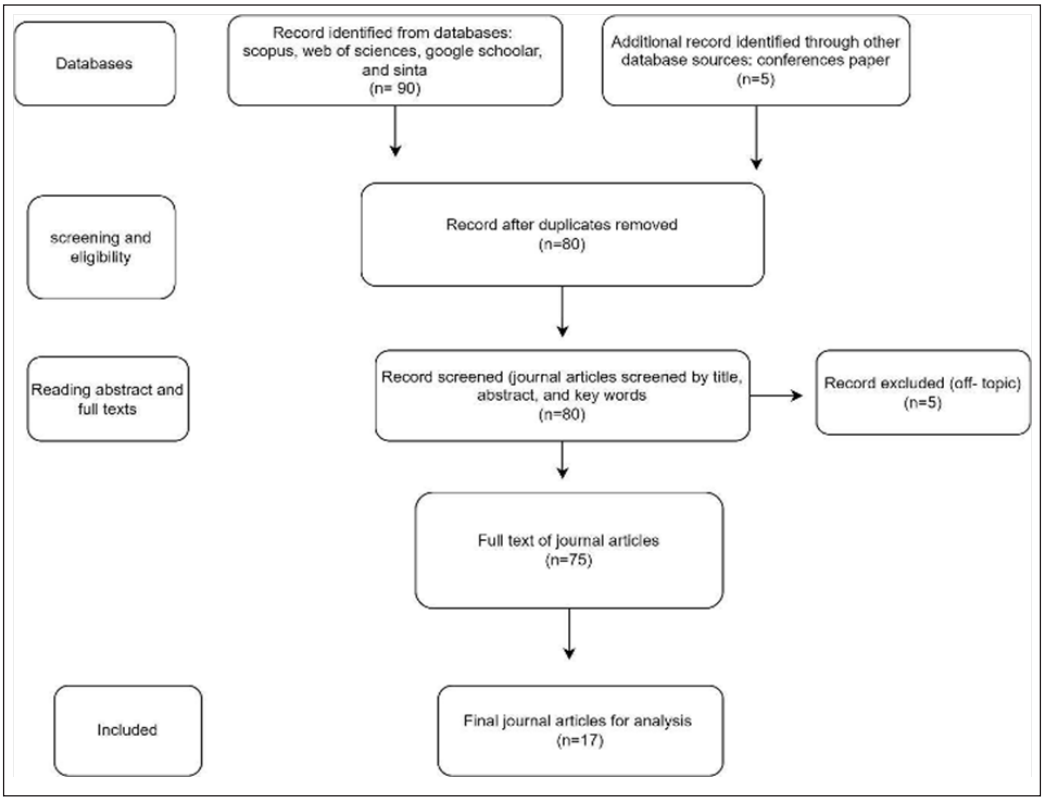

Figure 1. PRISMA flow diagram for the study (Sarkis-Onofre et al., 2021)

The integrative literature review, analyzing data from 75 articles, highlights Kahoot's positive impact on learning outcomes, especially grammar achievement. Studies consistently show that non-traditional methods like Kahoot improve academic performance. Ningsih et

al. (2024) and Suhayati and Andriani (2020) reported significant improvements in students' post-test scores, with Kahoot's gamified approach enhancing student engagement and academic results. Gamification led to better attendance, reduced tardiness, and improved grades, with 61% of students in the gamified group outperforming the traditional group.

Kahoot enhances student engagement and motivation and reduces anxiety (Baydas & Cicek, 2019; Bicen & Kocakoyun, 2018). It energizes students, making learning fun and increasing participation. In grammar instruction, Kahoot helps teachers create interactive quizzes, providing quick feedback to students and improving understanding and retention (Musdalifah et al., 2018). Kahoot has been shown to significantly improve grammar learning outcomes, fostering an engaging, interactive, and motivating classroom environment. It highlights Kahoot's potential as an effective tool for enhancing grammar comprehension and promoting active learning.

CONCLUSION

This study reviewed 48 papers on the impact of playing Kahoot on participants' grammar achievement. It aims to address three research questions: the benefits of using Kahoot, its effect on students' grammar performance, and its application in grammar learning. Kahoot, a game-based learning tool, promotes engagement and motivation through fun, competition, and activities, enhancing learning in challenging subjects. The findings suggest that Kahoot boosts motivation, positive attitudes, and confidence in grammar lessons, creating an engaging and competitive environment. Students felt more comfortable participating openly, making the classroom more interactive and enjoyable. Kahoot and gamification generally improve classroom dynamics, student engagement, and motivation. However, challenges remain, and the study did not include all databases, such as the Web of Science, suggesting that further research should expand its scope.

ACKNOWLEDGEMENT

I want to express my deepest gratitude to everyone who supported and guided me during the completion of this article. I sincerely thank my advisors for their invaluable guidance, Yogyakarta State University for providing me with essential resources, and my family and friends for their unwavering support in contributing to this research. This article is dedicated to educators and researchers who strive to innovate teaching practices, hoping to contribute to the discourse of game-based learning in education.

REFERENCES

Baydas, O., & Cicek, M. (2019). The examination of the gamification process in undergraduate education: A scale development study. *Technology, Pedagogy and Education*, *28*(3), 269-285. https://doi.org/10.1080/1475939X.2019.1580609

Bicen, H., & Kocakoyun, S. (2018). Perceptions of students for Gamification approach: Kahoot as a case study. *International Journal of Emerging Technologies in Learning (iJET), 13*(2),72-93. https://doi.org/10.3991/ijet.v13i02.7467

Cam, L., & Tran, T. M. T. (2017). An evaluation of using games in teaching English grammar for first year English-majored students at Dong Nai Technology University. *International journal of learning, teaching and educational Research*, *16*(7), 55-71.

Habibi, P. K. (2021). Effectiveness of deductive and inductive instruction in EFL classes. *Strength for Today and Bright Hope for Tomorrow*, *21*(1), 82-90.

Ifenthaler, D., Gibson, D. C., & Zheng, L. (2018, July). The dynamics of learning engagement in challenge-based online learning. In *2018 IEEE 18th International Conference on Advanced Learning Technologies (ICALT)* (pp. 178-182). IEEE. https://doi.org/10.1109/ICALT.2018.00049

Musdalifah, Abdul, N, & Saiful. (2018). Using Kahoot website in learning grammar: Pre-experimental Research. *Journal of Computer Interaction in Education*, *1*(2), 161-167.

Ningsih, B. S. U., & Muhayyang, M. (2024). The use of Kahoot to improve students' grammar at SMA Insan Cendekia Syech Yusuf. *ARRUS Jurnal of Social Sciences and Humanities, 4*(2), 152-159. https://doi.org/10.35877/soshum2473

Sarkis-Onofre, R., Catalá-López, F., Aromataris, E., & Lockwood, C. (2021). How to properly use the PRISMA Statement. *Systematic Reviews, 10*, Article 117. https://doi.org/10.1186/s13643-021-01671-z

Soyoof, A., Reynolds, B. L., Vazquez-Calvo, B., & McLay, K. (2023). Informal digital learning of English (IDLE): A scoping review of what has been done and a look towards what is to come. *Computer Assisted Language Learning*, *36*(4), 608-640. https://doi.org/10.1080/09588221.2021.1936562

Suhayati, L., & Andriani, D. I. (2021). The effect of kahoot! and screen recording videos on students' grammar achievement during Covid-19 outbreak. In *The 1st International Conference on Research in Social Sciences and Humanities (ICoRSH 2020)* (pp. 503-512). Atlantis Press.

Pertanika Proceedings 1 (2): 39 - 43 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

A Bibliometric Study on Mathematical Modelling in Elementary Schools in the Scopus Database Between 1990–2024

Hardian Mei Fajri[1]*, Arita Marini[2] and Suyono[3]

[1]Doctoral Student of Basic Education, Faculty of Education, Universitas Negeri Jakarta, 13220, Jakarta, Indonesia
[2]Department of Basic Education, Faculty of Education, Universitas Negeri Jakarta, 13220, Jakarta, Indonesia
[3]Faculty of Mathematics and Natural Sciences, Universitas Negeri Jakarta, 13220, Jakarta, Indonesia

ABSTRACT

Mathematical modeling is an approach to bridging real-world problems into mathematics in an effort to improve students' mathematical literacy. The purpose of this study is to conduct a bibliometric analysis of published articles related to Mathematical Modelling in Elementary School. This study used the Scopus database scanned with the keywords "Mathematical Modelling" and "Elementary School" with a time span of 1990–2024, obtaining as many as 78 articles. The data collected was then analyzed using R-software and VOSviewer applications. This study found that the development trend of Mathematical Modeling research in Elementary Schools significantly increased after 2015–2023 with a percentage of 67.95%. Authors from Germany and Denmark dominate the top researchers with the most influence. Furthermore, in recent years, the dominant topics in Mathematical Modeling research studies in elementary schools include Mathematical Modeling Cycle, Development, Mathematical Modeling Competency, Mathematical Concept, Mathematical Knowledge, Modeling Process, Mathematical Modeling Task, Empirical Study, and Creative Thinking. It is hoped that future research will focus on the literature on mathematical modeling at the high school and college levels.

Keywords: A bibliometric study, elementary schools, mathematical modelling

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.007

E-mail addresses:
hardianmf@gmail.com (Hardian Mei Fajri)
aritamarini@unj.ac.id (Arita Marini)
suyono@unj.ac.id (Suyono)
* Corresponding author

INTRODUCTION

Mathematical modeling is a promising research study and learning approach that can be implemented at every level of education. Although modeling has been taught informally for centuries, mathematical modeling has only recently emerged formally in education (Spooner,

2024). The study of teaching and learning mathematical modeling has grown to the extent that it has become a research field within the mathematics education community (Blomhø, 2019). Mathematical modeling is important in mathematics education worldwide and has been integrated into curricula and academic standards (Alwast & Vorholter, 2022). In addition, mathematical modeling has an impact on student learning outcomes, especially on mathematical literacy skills. Mathematical competence in the KOM-Project (mathematical modeling) shapes the PISA mathematics framework (Berget, 2023).

Bibliometric analysis contains many features to map information, such as network structure, keywords, publications, references, journals, and authors in the research field (Aria & Cuccurullo, 2022). Several previous studies have used bibliometric analysis of various research areas such as management (Lin et al., 2024), education and sustainable development (Prieto-Jiménez et al., 2021), use of technology in higher education (Díaz-García et al., 2022), social sciences (Mervar & Jokić, 2022), STEAM (Jantakun et al., 2024), and mathematics education (Cevikbas et al., 2022). The research question is: What are the popular research topic trends in the Mathematical Modelling in Elementary School literature in the Scopus database from 1990–2024?

METHOD

The method used in this research is bibliometric analysis (Figure 1), which uses the R-software and VOSviewer application tools. The researcher then conducted the document screening and eligibility step, determining and applying inclusion or exclusion criteria based on the title, topic, abstract and document content.

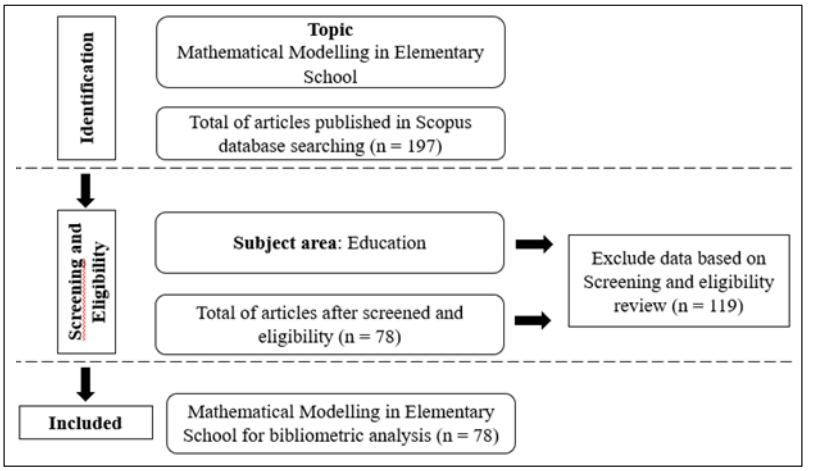

Figure 1. Flowchart of PRISMA procedure in filtering articles for bibliometric analysis

RESULTS AND DISCUSSION

Figure 2 shows the results of the co-occurrence analysis from VOSviewer. The most popular keywords in this research topic are Mathematical Modelling, Elementary School, Student, Problem, and teacher.

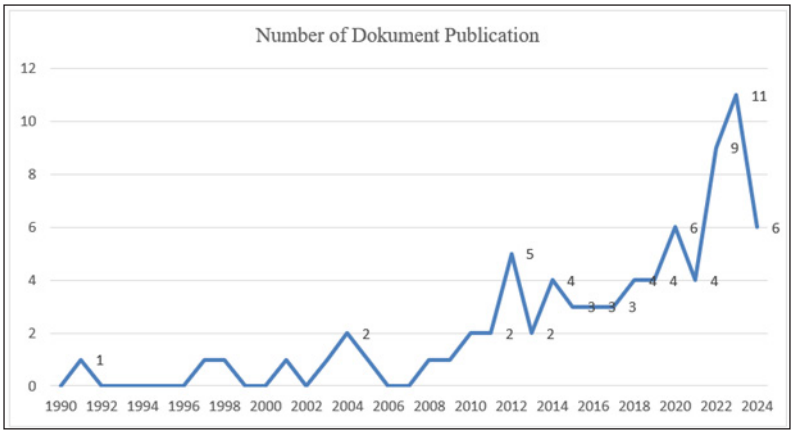

Figure 2. Co-occurrence of keywords on mathematical modeling research in elementary school between 1990 and 2024

The relationship between keywords is based on the circle's size and the path line's thickness, which means that the keywords have a strong relationship and often appear together with other keywords. The current trend of Mathematical Modelling research topics in elementary schools has become very diverse. These research topics mostly focus on developing and designing research methods for developing Mathematical Modelling Tasks. Then, the current research topic trend focuses on supporting learning activities such as improving Mathematical Modelling Competency, Mathematical Concept, Mathematical Knowledge, Modelling Process, and Creative Thinking.

Several studies have been conducted on the research topic of Mathematical Modelling in Elementary Schools, including combining Mathematical Modelling as a learning environment with the use of Virtual Manipulatives to help first-grade elementary school students overcome the difficulties detected in their learning related to basic arithmetic operations (Silva et al., 2021), modeling tasks on basic arithmetic operations assisted by artificial intelligence tools (Spreitzer et al., 2024), creating a mathematical modeling lesson based on Ethnomathematics in improving creative thinking of elementary school students (Supriadi et al., 2023), designing mathematical modeling tasks that provide experience in a financial context (Tural-Sonmez & Erbas, 2023), providing mathematical modeling problems to train grade 6 students in building conceptual models and understanding fractions (Shahbari & Peled, 2015).

CONCLUSION

The results of this study have implications for future researchers, teachers, and education policymakers. Based on research questions, namely on research topic trends in the form of popular keywords in mathematical modeling research, are useful for other researchers in identifying research topics that they can do in the future.

ACKNOWLEDGEMENT

The author would like to thank all parties who have helped and supported this research. The author would also like to thank the lecturers who have helped, educated, and provided guidance during the research. The author would also like to thank all parties who have helped in this research, both directly and indirectly. I hope this research can be useful for readers

REFERENCES

Aria, M., & Cuccurullo, C. (2022). *Science Mapping Analysis with bibliometrix R-package: An Example.* Bibliometrix.

Alwast, A., & Vorhölter, K. (2022). Measuring pre-service teachers' noticing competencies within a mathematical modeling context – An analysis of an instrument. *Educational Studies in Mathematics*, *109*(2), 263–285. https://doi.org/10.1007/s10649-021-10102-8

Berget, I. K. L. (2023). Mathematical modelling in the discourses of the KOM and PISA frameworks and teacher interviews. *Research in Mathematics Education*, *26*(3), 425–442. https://doi.org/10.1080/14794802.2023.2165536

Blomhøj, M. (2019). Towards integration of modelling in secondary mathematics teaching. In G. A. Stillman & J. P. Brown (Eds.) *Lines of Inquiry in Mathematical Modelling Research in Education* (pp. 37–52). Springer. https://doi.org/10.1007/978-3-030-14931-4_3

Cevikbas, M., Kaiser, G., & Schukajlow, S. (2022). A systematic literature review of the current discussion on mathematical modelling competencies : State-of-the-art developments in conceptualizing, measuring, and fostering. *Educational Studies in Mathematics, 109*(2), 205-236. https://doi.org/10.1007/s10649-021-10104-6

Cevikbas, M., Kaiser, G., & Schukajlow, S. (2022). A systematic literature review of the current discussion on mathematical modelling competencies : State-of-the-art developments in conceptualizing, measuring, and fostering. *Educational Studies in Mathematics, 109*(2), 205-236. https://doi.org/10.1007/s10649-021-10104-6

Díaz-García, V., Montero-Navarro, A., Rodríguez-Sánchez, J. L., & Gallego-Losada, R. (2022). Digitalization and digital transformation in higher education: A bibliometric analysis. *Frontiers in Psychology*, *13*, Article 1081595. https://doi.org/10.3389/fpsyg.2022.1081595

Jantakun, K., Jantakun, T., Trisupakitti, S., & Limpinan, P. (2024). STEAM education with gamification: A bibliometric analysis. *Higher Education Studies*, *14*(3), Article 90. https://doi.org/10.5539/hes.v14n3p90

Lin, X., Ribeiro-Navarrete, S., Chen, X., & Xu, B. (2024). Advances in The innovation of management: A bibliometric review. *Review of Managerial Science*, *18*(6), 1557–1595. https://doi.org/10.1007/s11846-023-00667-4

Mervar, A., & Jokić, M. (2022). Core-Periphery nexus in the EU social sciences: Bibliometric perspective. *Scientometrics*, *127*(10), 5793–5817. https://doi.org/10.1007/s11192-022-04493-5

Prieto-Jiménez, E., López-Catalán, L., López-Catalán, B., & Domínguez-Fernández, G. (2021). Sustainable development goals and education: A Bibliometric mapping analysis. *Sustainability*, *13*(4), Article 2126. https://doi.org/10.3390/su13042126

Shahbari, J. A., & Peled, I. (2017). Modelling in Primary School: Constructing conceptual models and making sense of fractions. *International Journal of Science and Mathematics Education*, *15*(2), 371–391. https://doi.org/10.1007/s10763-015-9702-x

Silva, R., Costa, C., & Martins, F. (2021). Using mathematical modelling and virtual manipulatives to teach elementary mathematics. In A. Reis, J. Barroso, J. B. Lopes, T. Mikropoulos & C. W. Fan (Eds.) *Technology and Innovation in Learning, Teaching and Education* (pp. 75–89). Springer International Publishing. https://doi.org/10.1007/978-3-030-73988-1_6

Spooner, K. (2024). What does mathematical modelling have to offer mathematics education? Insights from students' perspectives on mathematical modelling. *International Journal of Mathematical Education in Science and Technology*, *55*(3), 615–627. https://doi.org/10.1080/0020739X.2021.2009052

Spreitzer, C., Straser, O., Zehetmeier, S., & Maaß, K. (2024). Mathematical Modelling abilities of artificial intelligence tools: The case of ChatGPT. *Education Sciences*, *14*(7), Article 698. https://doi.org/10.3390/educsci14070698

Supriadi, S., Alfarisa, F., Hanif, M., & Belinda, B. (2023). Elementary school students: Analysis of questionnaire in creative thinking and mathematical modelling in ethnomathematics learning. *AIP Conference Proceedings*, *2621*(1), Article 020008. https://doi.org/10.1063/5.0142463

Tural-Sonmez, M., & Erbas, A. K. (2023). Seventh-Grade Students' Understanding of Risk and Reward Arising from Mathematical Modelling Activities. *International Journal of Mathematical Education in Science and Technology,* 1–29. https://doi.org/10.1080/0020739X.2023.2258881

Pertanika Proceedings 1 (2): 45 - 48 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Exploring Students' Perception and Experience with Grammarly in English Language Class

Harniken Farensya* and Yuyun Yulia

Master of English Education Department, Faculty of Language, Arts, and Culture, Yogyakarta State University, Special Region of Yogyakarta 55281, Indonesia

ABSTRACT

This study explores students' perceptions and experiences with *Grammarly* in English language classes. A mixed-methods approach, including surveys and interviews, collected data from 100 undergraduate students to examine their attitudes towards *Grammarly*, its impact on writing quality and confidence, and its implications for language learning. The findings reveal a positive perception of *Grammarly* among students, with high levels of satisfaction reported regarding its usability and effectiveness in identifying and correcting errors. Students also reported improvements in writing quality, confidence, and motivation after using *Grammarly*. These findings suggest that *Grammarly* is a valuable support tool in English language education, providing real-time feedback and personalized guidance to enhance students' writing skills. However, challenges such as overreliance on *Grammarly* and limitations in accessibility were also identified. Implications for practice include integrating *Grammarly* strategically into language learning curricula and emphasizing its role as a learning aid. Recommendations for future research include longitudinal studies to explore long-term effects and comparative studies to evaluate the effectiveness of *Grammarly* relative to other writing support tools. Overall, this study contributes to our understanding of the role of technology in language learning and informs pedagogical practices in English language education.

Keywords: English language learning, technology in education,writing assistant

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.008

E-mail addresses:
harnikenfa@gmail.com (Harniken Farensya)
yuyunyulia@uny.ac.id (Yuyun Yulia)
* Corresponding author

INTRODUCTION

Information and Communication Technology (ICT) plays a vital role in modern education, especially in enhancing writing skills. Grammarly, an AI-based tool, provides real-time feedback on grammar and style, complementing traditional teaching methods. Amid the challenges of achieving

effective writing, Grammarly helps students address errors and encourages independent learning (Johnson & Smith, 2020; Zhang & Hyland, 2018). However, overreliance on such tools may reduce student engagement in writing (Wilson & Czik, 2019), and Grammarly may not always capture creative aspects of writing (Vojtko & Rai, 2020).

This study explores students' perceptions and experiences with Grammarly and its impact on their writing skills and motivation. A mixed-methods approach was employed, integrating surveys, interviews, and analysis of writing samples (Creswell & Creswell, 2017). Participants consisted of 100 undergraduate students selected through purposive sampling to ensure diversity. Surveys measured students' perceptions and Grammarly's effectiveness, interviews provided in-depth insights into their experiences, and writing samples before and after using Grammarly were analyzed to assess improvements. The data were analyzed sequentially, with descriptive statistics for quantitative data and thematic analysis for qualitative data. Triangulation was employed to ensure consistency and depth in the findings.

PROBLEM STATEMENT

Many students struggle with grammar and coherence in writing, which affects the quality of their academic performance. Traditional teaching methods often lack instant feedback, making the revision process slow and ineffective. Grammarly offers a solution by providing AI-based suggestions instantly. However, challenges arise from overreliance on this tool, which may hinder active engagement and critical thinking. Furthermore, Grammarly cannot fully address creative and contextual aspects of writing, underscoring the need for teachers' involvement. This study aims to explore how students perceive and experience Grammarly, ensuring it supports rather than replaces independent writing skills.

RESEARCH QUESTIONS

Students' Perception of Grammarly

Most students reported a positive perception of Grammarly. Over 80% found it easy to use and effective in identifying errors. Interviews reinforced this, highlighting the tool's convenience and accessibility. One student shared, "Grammarly feels like a personal assistant, helping me spot mistakes I hadn't noticed." These findings align with Johnson and Smith (2020), who reported high student satisfaction with Grammarly's effectiveness.

Data Analysis Techniques

Data analysis follows a sequential mixed-methods design, where quantitative data are analyzed first, followed by the interpretation phase (Creswell & Clark, 2018). Quantitative data from surveys are analyzed using descriptive statistics to summarize participants'

responses and identify patterns and trends. Qualitative data from interviews and writing samples are analyzed thematically to identify recurring themes and extract meaningful insights. Integration of quantitative and qualitative findings occurs through triangulation, allowing for a comprehensive understanding of students' perceptions and experiences with Grammarly.

Impact on Writing Quality, Confidence, and Motivation

Grammarly was found to enhance both writing quality and confidence. It provides real-time feedback, encouraging students to pay closer attention to grammar and writing style. One student reflected, "Grammarly has made me more careful with my writing." Motivation also improved, as students felt more confident tackling writing tasks. These results align with Chen and Wang (2022), who found that Grammarly increased students' self-efficacy and motivation.

Challenges and Opportunities in Integrating Grammarly

While Grammarly offers substantial benefits, concerns about overreliance persist, potentially hindering the development of independent writing skills. Additionally, occasional inaccuracies in contextual suggestions require teacher intervention. Limited access to the tool is another challenge for some students. Therefore, it is essential to integrate Grammarly strategically, promoting critical thinking and autonomy instead of reliance.

CONCLUSION

Grammarly is perceived positively by students as an effective and user-friendly tool that enhances writing quality, confidence, and motivation. However, challenges such as overreliance and limited access must be addressed to ensure they support independent learning. Thus, Grammarly should be integrated as a supplementary tool that fosters critical thinking and self-reliance. Further research is recommended to assess the long-term impact of Grammarly and its effectiveness compared to other writing tools across different learning contexts.

ACKNOWLEDGEMENT

The researcher expresses gratitude to the participants who contributed to this study.

REFERENCES

Chen, Y., & Wang, H. (2022). The impact of grammarly on students' self-efficacy and motivation in writing. *Journal of Educational Technology & Society*, 25(1), 76-89.

Creswell, J. W., & Creswell, J. D. (2017). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). SAGE Publications.

Creswell, J. W., & Clark, V. L. P. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications.

Johnson, R., & Smith, L. (2020). The efficacy of grammarly in correcting writing errors. *Journal of Writing Tools*, 15(2), 87-104.

Vojtko, R., & Rai, L. (2020). Student perceptions of digital writing tools: Benefits and challenges. *Education and Information Technologies*, 25(3), 2215-2233.

Wilson, K., & Czik, A. (2019). Automated writing evaluation: Improving writing quality and reducing writing anxiety. *Computers and Education, 140*, 103-604.

Zhang, Z., & Hyland, K. (2018). The impact of computer-based feedback on students' written work. *Journal of Second Language Writing*, *40*, 26-38.

Pertanika Proceedings 1 (2): 49 - 53 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Gamifying English Language Teaching: A Narrative Inquiry into the Use of *Quizizz*

I Made Rian Irwanto* and Yuyun Yulia

Universitas Negeri Yogyakarta, Master of English Education Department, Faculty of Language, Arts, and Culture, 55281, Special Region of Yogyakarta, Indonesia

ABSTRACT

This study investigates how English teachers implement *Quizizz* as a gamification tool in their ELT (English Language Teaching). Despite the growing adoption of technology in education, research on the comprehensive integration of gamification tools across various instructional stages beyond their application in assessments remains limited. This research employs a narrative inquiry approach to explore the strategies teachers use and the challenges they face. It aims to understand how *Quizizz* influences teaching practices through the personal experiences of educators. Through semi-structured interviews with three experienced and certified teachers, the study reveals effective strategies such as using *Quizizz* for micro-skills development, such as vocabulary and grammar practice, aligning activities with learning objectives and incorporating the tool at various instructional stages. Teachers reported significant increases in student engagement and motivation attributed to the competitive elements and immediate feedback provided by *Quizizz*. However, challenges such as technology access, digital literacy, and infrastructure limitations were also noted. Teachers implemented solutions like backup plans, alternative assignments, and collaborative learning strategies to address these issues. The study highlights the adaptability of *Quizizz*, recommending further investment in technological infrastructure and professional development to optimize its use. Recommendations for future practice include investing in technological infrastructure, enhancing digital literacy, and fostering collaboration are strongly suggested. This study enhances the understanding of gamification in ELT and provides valuable insights for advancing the use of digital tools in education.

Keywords: English language teaching (ELT), gamification, narrative inquiry, *Quizizz*

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.009

E-mail addresses:
i5246fbsb.2023@student.uny.ac.id (I Made Rian Irwanto)
yuyunyulia@uny.ac.id (Yuyun Yulia)
* Corresponding author

INTRODUCTION

Technology integration in education, especially in English as a Foreign Language (EFL) teaching, has grown considerably

e-ISSN: 3083-9475

in recent years. Indonesian EFL teachers exhibit varying confidence levels in adopting technology, ranging from medium to high self-efficacy (Lailiyah & Cahyono, 2017). This variability underscores the need for continuous professional development to ensure teachers effectively integrate technology into their teaching practices (Kim et al., 2019). Teachers must adapt to technological advancements to enhance the learning experience and student engagement.

One notable technological advancement is gamification, which integrates game design features like points, badges, and leaderboards into non-game environments to boost motivation (Aini et al., 2019). Research consistently shows that gamification improves student motivation, participation, and academic performance (Zhang & Hasim, 2023). In EFL settings, gamification can transform traditional classrooms into dynamic environments, reducing anxiety and enhancing language skills (Julita, 2024; Phuong, 2020).

Teachers showed positive attitudes toward using digital literacy for EFL instruction, producing practical lessons, and enhancing students' language skills. Despite this, challenges such as inadequate technology, student backgrounds, and limited resources hindered digital literacy implementation (Pratolo & Solikhati, 2020).

Quizizz, an interactive gamified learning platform, offers opportunities to make EFL classrooms interactive and enjoyable through quizzes. Although widely used for assessment purposes (Fadillah & Maryanti, 2021), its application in other instructional stages is less explored. This study addresses this gap by examining how English teachers integrate *Quizizz* beyond assessments and the challenges they face. The central research question is: "How do English teachers describe their efforts and experiences using *Quizizz* to integrate gamification into ELT?" Sub-questions include: (RQ1) What strategies do teachers use to incorporate *Quizizz* into their practices? (RQ2) What challenges do they face, and how do they overcome them?

METHODOLOGY

This study employed a narrative inquiry approach to explore English teachers' experiences using *Quizizz* in their teaching practices. Three English teachers were selected through purposive sampling to ensure diverse perspectives across elementary, middle, and high school levels. These participants were chosen based on their recognition as "*Quizizz* Super Trainers" and extensive experience using the platform in classroom settings.

Data was collected through a combination of written narratives and in-depth semi-structured interviews conducted via Zoom. Follow-up semi-structured interviews, lasting 45 minutes to one hour, offered more profound insights into specific strategies and challenges.

The data analysis process uses thematic analysis, beginning with familiarization through the review of interview transcripts and narratives. Open coding is applied to identify key segments related to integrating Quizizz and classroom challenges, which are grouped into

main themes. Member checking and triangulation are conducted to validate the findings and enhance credibility. The researcher then interprets and links the data to previous studies to generate new insights and place the findings within a broader academic context.

FINDINGS AND DISCUSSION

Strategies for Integrating *Quizizz* into ELT

The findings reveal that English teachers employ various strategies when integrating *Quizizz* into their teaching practices. Primarily, *Quizizz* reinforces vocabulary and grammar through gamified activities, which use competition and immediate feedback to boost engagement. This outcome is consistent with earlier research emphasizing the motivational advantages of gamification in education (Hamari et al., 2014).

Beyond vocabulary and grammar, teachers emphasized the need to align *Quizizz*'s activities with specific learning objectives. Designing quizzes that complement instructional goals ensured gamification enhanced learning rather than distracting from it. It supports Dichev and Dicheva's (2017) argument that gamification must serve educational outcomes.

An important contribution of this study is the flexible use of *Quizizz* throughout different teaching stages. Teachers used it for assessment, as a warm-up, and as a formative tool to check understanding. This adaptability highlights the versatility of digital tools in supporting instruction, as Gee (2003) noted.

Additionally, teachers adapted *Quizizz* creatively to fit their classroom needs, moving beyond its traditional role in testing. This contrasts with earlier research, which often prioritizes student-centered outcomes and overlooks teachers' pedagogical choices (Mårell-Olsson, 2022).

Challenges and Solutions in Integrating *Quizizz* into ELT

Common barriers include inconsistent internet connectivity, limited device access, and students' struggles navigating the platform. These issues reflect the digital divide, especially in resource-limited contexts (Warschauer, 2004).

Despite these challenges, teachers employed creative strategies to continue using *Quizizz*. One effective approach was *Quizizz*'s paper mode, which allowed students to participate without personal devices or reliable internet. Teachers displayed quizzes on a screen while students responded on paper using QR codes. Teachers then scanned responses with smartphones, ensuring real-time feedback and digital grading.

Additionally, teachers developed backup plans like printed quizzes and hybrid sessions to accommodate students with limited connectivity. This finding contributes to best practices for digital learning by offering practical examples of overcoming classroom challenges (Barker & Gossman, 2013).

Digital literacy also posed a significant challenge, which teachers addressed through training and tutorials to help students use *Quizizz* effectively. These efforts reflect the importance of digital literacy in optimizing educational technology (Barker & Gossman, 2013).

Institutional support played a key role in addressing these barriers. Some teachers worked with administrators to improve Wi-Fi or secure devices for students. The study demonstrates the necessity of systemic solutions often overlooked in earlier research to support digital tool integration. It underscores the need for more research on how institutions can facilitate the effective use of educational technology (Warschauer, 2004).

CONCLUSION

Key findings highlight *Quizizz*'s flexibility in enhancing student engagement, from warm-ups to formative assessments tailored to classroom needs. Educators should align the platform with learning objectives and leverage features like immediate feedback and competition to motivate students. The study also emphasizes the importance of institutional support in overcoming technological and digital literacy challenges.

While this study provides valuable insights, several limitations must be noted. The small sample size of three teachers, though allowing for in-depth exploration, may not fully capture the diversity of strategies and challenges in broader contexts. Future research should include classroom observations or student performance data for more objective insights. Moreover, focusing on schools with limited technology may not reflect experiences in more technologically equipped environments, calling for further investigation in diverse settings.

ACKNOWLEDGMENT

I would like to convey my deepest appreciation to my advisor, Yuyun Yulia, for her exceptional guidance and support during this research.

REFERENCES

Aini, Q., Hariguna, T., Putra, P. O. H., & Rahardja, U. (2019). Understanding how gamification influences behaviour in education. *International Journal of Advanced Trends in Computer Science and Engineering (Special Issue), 8*(1.5), 269-274. https://doi.org/10.30534/ijatcse/2019/4781.52019

Barker, J., & Gossman, P. (2013). The learning impact of a virtual learning environment: Students' views. *Teacher education advancement network journal (TEAN)*, *5*(2), 19-38.

Dichev, C., & Dicheva, D. (2017). Gamifying education: What is known, what is believed and what remains uncertain: A critical review. *International Journal of Educational Technology in Higher Education, 14*(1), 1-36. https://doi.org/10.1186/s41239-017-0042-5

Fadillah, I. N., & Maryanti, R. (2021). Application of learning videos and Quizizz in increasing students interest in learning english in middle schools. *Indonesian Journal of Multidiciplinary Research, 1*(2), 329–336. https://doi.org/10.17509/ijomr.v1i2.37853

Gee, J. P. (2003). What video games have to teach us about learning and literacy. Computers in Entertainment, 1(1), Article 20. https://doi.org/10.1145/950566.950595

Hamari, J., Koivisto, J., & Sarsa, H. (2014, January 6-9). Does gamification work? – A literature review of empirical studies on gamification. [Paper presentation]. 47th Hawaii International Conference on System Sciences, Waikoloa, USA. https://doi.org/10.1109/hicss.2014.377

Julita, R. (2024). The impact of gamification on EFL students' reading comprehension. *Journal of English as a Foreign Language Education (JEFLE)*, *4*(2), 136-149. https://doi.org/10.26418/jefle.v4i2.74901

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education, 14*(1), 99–117. https://doi.org/10.1177/1745499919829214

Lailiyah, M., & Cahyono, B. Y. (2017). Indonesian EFL teachers' self-efficacy towards technology integration (SETI) and their use of technology in EFL teaching. *Studies in English Language Teaching, 5*(2), 344-357. https://doi.org/10.22158/selt.v5n2p344

Mårell-Olsson, E. (2022). Teachers' perception of gamification as a teaching design. *Interaction Design and Architecture (s)*, *53*, 70-100. https://doi.org/10.55612/s-5002-053-004

Phuong, H. (2020). Gamified learning: Are Vietnamese EFL learners ready yet? *International Journal of Emerging Technologies in Learning, 15*(24), 242–251. https://doi.org/10.3991/ijet.v15i24.16667

Pratolo, B. W., & Solikhati, H. A. (2020). Investigating teachers' attitude toward digital literacy in EFL classroom. *Journal of Education and Learning (EduLearn), 15*(1), 97–103. https://doi.org/10.11591/edulearn.v15i1.15747

Warschauer, M. (2004). *Technology and social inclusion*. MIT Press.

Zhang, S., & Hasim, Z. (2023). Gamification in EFL/ESL instruction: A systematic review of empirical research. *Frontiers in psychology*, *13*, Article 1030790. https://doi.org/10.3389/fpsyg.2022.1030790

Pertanika Proceedings 1 (2): 55 - 59 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Implementation of Artificial Intelligence in Teachers' Technological Pedagogical and Content Knowledge in EFL Context

Intan Fatma Sari, Yuyun Yulia*, Andi Reza Hidayat and I Made Rian Irwanto

Yogyakarta State University, Master of English Education Department, Faculty of Language, Arts, and Culture, 55281, Special Region of Yogyakarta, Indonesia

ABSTRACT

Artificial Intelligence (AI) has become increasingly integral to education in today's technology-driven era, particularly within the Technological Pedagogical and Content Knowledge (TPACK) framework. This research investigates Indonesian EFL teachers' perspectives on the impact of AI in improving their instructional methods. It further analyzes how these perspectives affect the integration of TPACK in their teaching environments. The research employed a narrative inquiry approach, collecting data through semi-structured interviews with three EFL teachers of varying experience levels. The findings reveal that while teachers recognize AI's potential in personalizing students' learning and improving students' engagement, they face significant challenges in integrating AI effectively. These obstacles involve restricted resource availability, inadequate training, and inconsistent use of TPACK elements. The study highlights the need for professional development programs to build teachers' technological proficiency and foster a balanced integration of AI within the TPACK framework. Ultimately, the study recommends enhancing teacher training to ensure that AI is utilized to create dynamic and effective learning environments in EFL education.

Keywords: Artificial intelligence, EFL, TPACK

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.010

E-mail addresses:
intanfatma.2023@student.uny.ac.id (Intan Fatma Sari)
yuyunyulia@uny.ac.id (Yuyun Yulia)
andireza.2022@student.uny.ac.id (Andi Reza Hidayat)
i5246fbsb.2023@student.uny.ac.id (I Made Rian Irwanto)
* Corresponding author

INTRODUCTION

Nowadays, artificial intelligence (AI) has swiftly revolutionized multiple industries, including education. AI technologies offer educators new tools for enhancing teaching and learning experiences, providing personalized learning paths, automating assessments, and facilitating more efficient classroom management (Owan et al., 2023). The successful use of AI technology

e-ISSN: 3083-9475

depends on teachers having the pedagogical expertise required to utilize AI-driven tools effectively (Cavalcanti et al., 2021).

These advancements make AI a powerful ally in modern educational settings, particularly within the Technological Pedagogical and Content Knowledge (TPACK) framework. As shown in Figure 1, the TPACK framework, introduced by Mishra and Koehler (2006), highlights the essential intersection of three core domains of teacher expertise: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK).

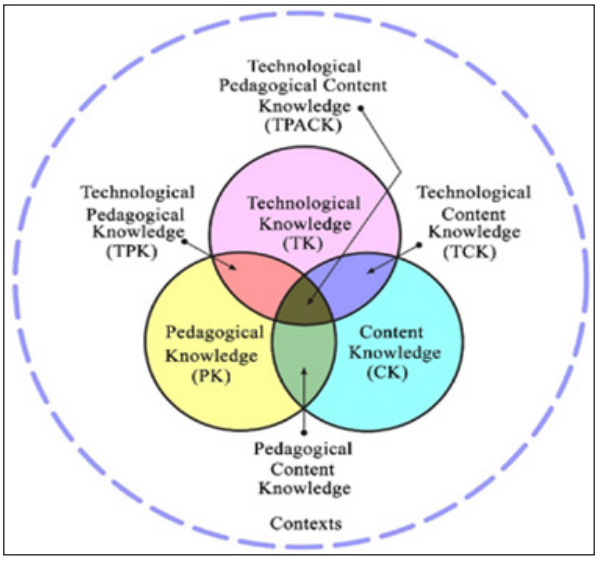

Figure 1. TPACK framework by Mishra and Koehler (2006)

While previous studies have explored the use of TPACK in various educational contexts, there is a significant gap in research regarding teachers' beliefs and practices concerning AI integration within the TPACK framework, especially in EFL settings. Consequently, there exists a limited comprehension of how educators interpret and assess decisions derived from AI technology (Celik, 2023). Therefore, understanding how EFL teachers perceive and integrate AI within the TPACK framework is crucial to developing professional development programs that better prepare educators for the demands of 21st-century teaching.

Recent studies answer several questions: (1) How do teachers believe in TPACK in EFL classrooms? (2) How does AI support teachers' implementation of TPACK in EFL classrooms? The study's novelty lies in the new perspective on teachers' perceptions of the possibilities and difficulties of AI, therefore impacting their approach to its integration in pedagogical settings.

METHODOLOGY

Research Design

Narrative inquiry was chosen because it is a valuable method for investigating teachers' beliefs about TPACK-integrated artificial intelligence.

Participant

The study involves three EFL English teachers, who were selected purposefully to represent varying experience levels with AI, as shown in Table 1.

Table 1
Participants' profile

Pseudonym	Age	Gender	Teaching Experience	Level School
Irfan	31	male	4 years	middle
Agnes	42	female	16 years	high
Rufa	28	female	7 years	middle

Data Collection

The researcher conducted a semi-structured interview. The researcher did narrative frame data collection. The interview was about an hour to two hours.

Data Analysis

The researcher analyzed all the collected data by organizing the narrative framework and the interviews. Then, the data was "restructured" into a broader analytical framework. Next, the researcher identified the data's key concepts, themes, and classifications. The codes were then linked to broader themes and categories within the TPACK framework. Finally, the researcher interpreted the data and connected it to previous studies.

FINDINGS AND DISCUSSION

Teachers' Belief in AI-TPACK in EFL Classrooms

Teachers generally view AI-based tools as helpful for improving content delivery and classroom management, aligning well with their current teaching approaches. They believe that AI enhances personalized learning, engages students through interactive activities, and supports the curriculum by offering flexible and up-to-date learning materials (Kong et al., 2024). These positive views motivate teachers to integrate AI into their lessons, considering it an essential tool for addressing the needs of 21st-century education.

They noted difficulties in helping students navigate AI technologies and develop digital literacy, which demands considerable time and effort. Concerns were also raised about AI

potentially affecting students' critical thinking skills, leading some teachers to be cautious in their approach to AI integration (Zhao, 2022). Therefore, applying AI within the TPACK framework requires more effort, especially in schools with fewer resources.

Artificial Intelligence in Teachers' Implementation of TPACK in EFL Classrooms

The three teachers agreed to improve their teaching quality by integrating multimedia AI technology to conduct a TPACK in the class. They utilize AI to motivate students, do assessments, deliver material, and create a supportive atmosphere. The incorporation of AI technology within the TPACK framework possesses the capacity to transform pedagogical methodologies and educational settings (Safriana et al., 2023). The proficiency of educators in integrating technology into classroom instruction, as an integral aspect of their pedagogical and professional competencies, is crucial for the attainment of effective teaching outcomes.

Experts in technology, pedagogy, or content knowledge frequently choose to teach by focusing on the individual aspect of TPACK rather than using the intersection of TPACK aspects. The teachers were inconsistent in practicing the balance of AI-TPACK in their classrooms. This finding aligns with Ning et al. (2024) observation that educators frequently struggle to balance these aspects, especially when confronted with emerging technologies like AI.

CONCLUSION

Teachers in this study recognized AI's ability to handle tasks like grading and feedback, allowing more focus on interactive language activities. However, implementing AI in the classroom was inconsistent, with some teachers focusing more on their expertise in either technology, pedagogy, or content knowledge rather than a balanced integration of all three. To fully benefit from AI in EFL education, teachers must develop proficiency across the TPACK model, ensuring AI supports meaningful language teaching.

ACKNOWLEDGEMENT

I sincerely thank my advisor, Yuyun Yulia, for her invaluable guidance and support and the study participants for their time and insights. We also acknowledge funding support from the Center for Education Financial Service - Indonesian Ministry of Education, Culture, Research and Technology (BPPT-Kemendikbudristek) and the Indonesia Endowment Funds for Education (LPDP).

REFERENCES

Cavalcanti, A. P., Barbosa, A., Carvalho, R., Freitas, F., Tsai, Y. S., Gašević, D., & Mello, R. F. (2021). Automatic feedback in online learning environments: A systematic literature review. *Computers and Education: Artificial Intelligence*, *2*, Article 100027. https://doi.org/10.1016/J.CAEAI.2021.100027

Celik, I. (2023). Towards intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior*, *138*, Article 107468. https://doi.org/10.1016/j.chb.2022.107468

Kong, H., Jiang, X., Zhou, X., Baum, T., Li, J., & Yu, J. (2024). Influence of artificial intelligence (AI) perception on career resilience and informal learning. *Tourism Review*, *79*(1), 219–233. https://doi.org/10.1108/TR-10-2022-0521/FULL/XML

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Ning, Y., Zhang, C., Xu, B., Zhou, Y., & Wijaya, T. T. (2024). Teachers' AI-TPACK: Exploring the relationship between knowledge elements. *Sustainability (Switzerland)*, *16*(3), Article 978. https://doi.org/10.3390/SU16030978/S1

Owan, V. J., Abang, K. B., Idika, D. O., Etta, E. O., & Bassey, B. A. (2023). Exploring the potential of artificial intelligence tools in educational measurement and assessment. *Eurasia Journal of Mathematics, Science and Technology Education*, *19*(8), Article em2307. https://doi.org/10.29333/EJMSTE/13428

Safriana, S., Irfan, A., & Fitri, Z. (2023). Science teachers perceptions of technological pedagogical content knowledge (TPACK) in urban area. *Malikussaleh International Conference on Multidisciplinary Studies, 3,* 00067-00067. https://doi.org/10.29103/micoms.v3i.232

Zhao, C. (2022). Perspectives on nonstationary process monitoring in the era of industrial artificial intelligence. *Journal of Process Control*, *116*, 255–272. https://doi.org/10.1016/J.JPROCONT.2022.06.011

Pertanika Proceedings 1 (2): 61 - 65 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Adaptive Learning Technology in EFL Education at "Jago Bahasa English Course"

Ma'rifatul Halimatus Sa'diyah[1]*, Yuyun Yulia[2], Aprilia Helmiyati Alim[3], Fauji Agusta[4], Agustian[5] and Muhammad Muslikhul Amin[6]

[1,2,3]English Education, Yogyakarta State University, Yogyakarta, Indonesia
[4,5]Science Education, Yogyakarta State University, Yogyakarta, Indonesia
[6]Tafsir Al-Qur'an and Hadis, STIQ Islamic Center, Demak, Indonesia

ABSTRACT

This study investigates the efficacy of Adaptive Learning Technology (ALT) in enhancing English speaking skills within an online English language course at the "Jago Bahasa English Course." The study analyses the experiences of instructors and students with ALT, focusing on its capability to tailor educational content to individual learner needs and provide real-time feedback, utilizing a qualitative research design. This research was conducted from March to May 2024. Data collection involved observations, interviews, and documentation of English instructors and students from an advanced-level program. The findings show that ALT enhances student engagement and motivation by providing interactive, gamified learning environments, catering to various learning preferences, and promoting self-directed learning. Moreover, technology's flexibility allows continuous access to educational resources, accommodating various learning schedules. This research underscores the potential of ALT to transform EFL education by making it more personalized, accessible, and effective, paving the way for its broader application in diverse educational settings.

Keywords: Adaptive Learning Technology, EFL Education, english course

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.011

E-mail addresses:
rifahmarifah12@gmail.com (Ma'rifatul Halimatus Sa'diyah)
yuyunyulia@uny.ac.id (Yuyun Yulia)
apriliahelmyyy@gmail.com (Aprilia Helmiyati Alim)
faujiagusta.2023@student.uny.ac.id (Fauji Agusta)
agustian0226fmipa.uny@student.uny.ac.id (Agustian)
mmuslikhulamin22@gmail.com (Muhammad Muslikhul Amin)
* Corresponding author

INTRODUCTION

The rapid growth of Information and Communication Technology (ICT) has significantly impacted education, resulting in the adoption of Adaptive Learning Technologies (ALT) to enhance learning of English as a Foreign Language (EFL). ALT utilizes data analytics and algorithms to create personalized learning experiences,

e-ISSN: 3083-9475

enabling educators to cater to individual needs and provide real-time feedback (Pandian, 2011). These technologies have proven particularly useful in addressing the challenges EFL learners face, such as limited speaking practice, high levels of anxiety, and a lack of confidence (Warschauer, 2011). By offering tailored resources and interactive practice, ALT helps create a supportive environment for language acquisition.

This study focuses on how AI-driven ALT tools can enhance speaking skills, an area that remains underexplored compared to reading and listening proficiency (Zou & Thomas, 2020). Speaking requires spontaneous communication and immediate feedback, making teaching more challenging through traditional methods (Griffiths & Tajeddin, 2020). While some research has examined the function of technology in language learning, the specific impact of ALT on speaking instruction, particularly in online EFL courses, has not been sufficiently addressed. This study aims to fill this gap by investigating the role of AI-powered tools, such as automated feedback systems and speech recognition software, in enhancing speaking skills.

This qualitative study involved 5 instructors and 10 students from the Jago Bahasa English Course's advanced-level program, selected purposively based on their experience with ALT in speaking instruction. Data was collected between March and May 2024 through observations, interviews, and document analysis, focusing on how ALT impacts students' speaking performance. The instruments were designed following Communicative Language Teaching (CLT) principles, which emphasize interaction and learner engagement, particularly through immediate feedback and personalized learning paths.

The instruments were pilot-tested with 10 participants, and feedback from 5 experts guided revisions to ensure clarity and validity. This study employed triangulation by comparing information from interviews, observations, and documents to ensure data credibility. Member checking was carried out by presenting preliminary findings to participants to ensure their accuracy and validity. These methodological steps strengthen the reliability of the study's findings, ensuring that the collected data reflect participants' genuine experiences with ALT.

PROBLEM STATEMENT

Adaptive Learning Technologies (ALT) have proven effective for reading and listening skills, but their potential for improving speaking skills in EFL education is still underexplored. Speaking requires real-time feedback and interaction, which traditional methods often lack. This study explores how AI-powered ALT tools, like automated feedback and speech recognition, can enhance students' speaking skills, offering insights into more personalized and engaging learning experiences.

RESEARCH QUESTIONS

1. How does the use of AI-Driven Adaptive Learning Technologies enhance the process of teaching and learning speaking skills in an online EFL course?
2. What role does automated feedback play in enhancing speaking skills among EFL learners?

The implementation of adaptive learning technologies (ALT) at the Jago Bahasa English Course has transformed teaching strategies by creating personalized and interactive learning environments tailored to individual learner needs. ALT tools, such as speech recognition software, automated feedback systems, and AI-driven modules, provide real-time support to students, helping them improve their speaking proficiency. Observations showed that real-time feedback significantly enhanced students' confidence and fluency by offering instant corrections in pronunciation, grammar, and sentence structure (Chapelle, 2003). Teachers also reported that ALT's adaptability allowed them to track students' progress effectively and make immediate adjustments to content, ensuring that the learning experience was personalized for each student (Yuan et al., 2019).

In addition to personalized support, ALT fosters learner engagement by integrating multimedia tools, such as videos, audio recordings, and simulated conversations, which provide authentic contexts for practicing speaking skills. This dynamic approach makes lessons more enjoyable and immersive for students. Furthermore, gamification elements—such as digital badges, quizzes, and role-playing scenarios—were found to enhance student motivation by creating a sense of accomplishment and competition. Teachers noted that students were more eager to participate in activities and took greater ownership of their learning journey, striving for continuous improvement (Martin & Bolliger, 2018).

These findings demonstrate that ALT has a transformative impact on speaking instruction by bridging the gap between individual learning needs and teaching strategies. The combination of real-time feedback, multimedia resources, and gamification helps students develop essential speaking skills and promotes a more autonomous and engaging learning environment.

Automated feedback plays a pivotal role in enhancing students' speaking skills by providing immediate, personalized responses that address specific errors. The system analyzes students' pronunciation, intonation, and grammar, offering targeted suggestions for improvement using speech recognition software. Observations and interviews revealed that students who received consistent automated feedback developed greater confidence in speaking activities and displayed steady progress over time (Higgins et al., 2010). Teachers highlighted that the instant nature of the feedback enabled students to correct mistakes promptly, fostering a more efficient learning process compared to traditional methods.

Beyond improving speaking performance, automated feedback promotes self-directed learning by tailoring activities to match each student's proficiency level (Wang, 2018). This personalized approach allows learners to focus on areas that require improvement, such as mastering specific pronunciation patterns or refining grammar usage. Incorporating multimedia resources, such as interactive speaking activities and pronunciation videos, enriches the learning process by accommodating various learning styles and encouraging students to engage more effectively with the content.

Automated feedback also plays a crucial role in reducing language anxiety. Since the feedback is provided privately and without judgment, students feel more comfortable experimenting with new vocabulary and expressions, which encourages active participation (Nguyen, 2016). This supportive environment motivates learners to practice regularly and develop speaking skills with greater confidence. The integration of gamification elements, such as progress tracking and achievement badges, further strengthens student motivation by encouraging them to set personal goals and track their improvements over time (Ryan & Deci, 2018). These features enhance specific speaking skills and help students become more autonomous learners, capable of sustaining their progress independently.

CONCLUSION

The use of Adaptive Learning Technologies (ALT) in the "Jago Bahasa English Course" has made English-speaking instruction more interactive, accessible, and engaging. ALT's real-time feedback, personalized learning paths, and multimedia resources have improved students' pronunciation, grammar, and fluency. Automated feedback and gamification have also increased student confidence and motivation for regular practice. These findings show that ALT can transform EFL teaching by addressing individual learning needs and supporting ongoing improvement, helping educators create more flexible, student-centered learning environments. Future research should explore the scalability of Adaptive Learning Technologies in diverse educational settings and investigate their long-term impact on language proficiency and learner autonomy.

ACKNOWLEDGEMENT

I sincerely thank my supervisor, Yuyun Yulia, for her exceptional guidance, support, and encouragement throughout this research. Her knowledge and insights significantly contributed to the success of this study, and I deeply appreciate her mentorship.

REFERENCES

Chapelle, C. A. (2003). *English Language Learning and Technology*. John Benjamins Publishing Company.

Griffiths, C., & Tajeddin, Z. (2020). Developing EFL Learners' Speaking Skills through Strategic Competence: A Qualitative Investigation. *Journal of English for Academic Purposes, 48*, 101–108.

Higgins, M., Grant, F., & Thompson, P. (2010). Formative assessment: Balancing educational effectiveness and resource efficiency. *Journal for Education in the Built Environment*, *5*(2), 4–24. https://doi.org/10.11120/jebe.2010.05020004

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning Journal, 22*(1), 205–222. https://doi.org/10.24059/olj.v22i1.1092

Nguyen, N. (2016). Motivation in language learning and Dornyei's L2 motivational self system. In B. Liyanage & N. Nima (Eds.), *Multidisciplinary Research Perspectives in Education: Shared Experiences from Australia and China* (pp. 67–72). SensePublishers. https://doi.org/10.1007/978-94-6300-615-6_9

Pandian, A. (2011). *Integrating Technology in the Classroom: A Guide for Teachers*. Malaysian Press.

Ryan, R. M., & Deci, E. L. (2018). *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness*. Guilford Publications.

Wang, X. (2018). Applying new technologies to upgrade non-English speakers' English speaking skills. *International Journal of Emerging Technologies, 14*(3), 245–256.

Warschauer, M. (2011). *Learning in the Cloud*. Teachers College Press.

Yuan, C., Wang, L., & Eagle, J. (2019). Empowering English language learners through digital literacies: Research complexities and implications. *Media and Communication, 7*(2), 128–136. https://doi.org/10.17645/mac.v7i2.1912

Zou, B., & Thomas, M. (2020). Recent developments in technology-enhanced and computer-assisted language learning. *Advances in Educational Technologies and Instructional Design, 3*, 201–214.

Pertanika Proceedings 1 (2): 67 - 72 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Problems in Implementing the Independent Curriculum in Primary School Phase C Science Learning

Meilan Tri Wuryani*, Ade Bagus Primadoni, Rachmat Imam Muslim and Sabila Rakma

Graduate School, State University of Muhammadiyah Kendal Batang, 51272, Batang, Indonesia

ABSTRACT

This research is motivated by the obstacles experienced in learning science at the elementary school level during the implementation of the independent curriculum. This obstacle is considered one of the factors that reduce student learning outcomes. These obstacles can be in the form of obstacles that come from the way teachers teach to the way students receive learning. This research aims to analyze the various problems experienced by teachers and students in learning science. The research was conducted in the form of descriptive qualitative research, and it was conducted on all fifth-grade students at the state elementary school Tersono, which amounted to 19 people as a population. Research instruments are observation guidelines, questionnaires, and interviews. The results revealed that there were several problems experienced in learning science, including the ineffectiveness of the teacher-centered approach during learning and the use of inappropriate learning media. The solution to overcome these problems is for educators to change or adjust the learning approach so that students do not become passive and can choose the right learning media and involve all students.

Keywords: Elementary school, independent curriculum, problematics, science learning

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.012

E-mail addresses:
meilantwuryani@gmail.com (Meilan Tri Wuryani)
adebagus303@gmail.com (Ade Bagus Primadoni)
rachmatimam.spd@gmail.com (Rachmat Imam Muslim)
sabilarakma@gmail.com (Sabila Rakma)
* Corresponding author

INTRODUCTION

The implementation of learning at all levels of education in Indonesia still tends to focus on intellectual aspects and is more concerned with learning outcomes in the cognitive domain. This results in values, attitudes, interests and creativity that are often overlooked (Dakhi, 2022). Therefore, teachers need to make efforts to increase student creativity, either in the form of

learning models or by creating media and other things that can support student creativity (Bereczki & Kárpáti, 2021; Riswakhyuningsih, 2022).

PROBLEM STATEMENT

The results of observations in the field of class V of state elementary school Tersono show that school facilities are adequate, but their use is not appropriate. At state elementary school Tersono, using projectors for children seems to have become commonplace compared to other elementary schools. However, it is still said to be inappropriate because, judging from its use, it is still not in accordance with the material given to students. The students in the class became passive and only paid attention to the images/videos displayed on the projector without gaining any learning experience. In fact, science learning really requires natural surroundings and daily life experiences. With this, it can be concluded that adequate facilities do not necessarily support success because their use is not appropriate. Apart from the use of media, observations also show that learning in the classroom is still teacher-centered. From this explanation, it can be concluded that inappropriate use of learning tools, facilities, and infrastructure will cause students to become passive because they are not actively involved in the learning process.

This shows that teachers still experience problems in science learning at the state elementary school Tersono. Learning problems will influence student learning outcomes, especially in understanding or deepening teaching material.

RESEARCH QUESTIONS

This research aims to analyze the various problems experienced by teachers and students in learning science. In this case, this research discusses and maps the problems experienced by the teacher in science learning. Therefore, the formulation of the problem in this research is what obstacles teachers experience in teaching science in Phase C (Grade 5) of elementary schools.

METHOD

This study used a descriptive qualitative method. The research subjects this time were 19 students in class V of state elementary school Tersono, whose students consisted of 12 female students and 7 male students, as well as 2 teachers who taught in class V. This class is the subject of research because it is seen from the perspective of science learning material which has entered a difficult phase for elementary school age. So, difficulties or problems that occur in science learning need to be analyzed, and it is hoped that solutions can be found so that student learning outcomes do not decrease. The data in this research was taken through interviews and observation methods. Triangulation techniques were

used to ensure valid data. The data analysis in this research uses Miles and Huberman data analysis techniques, which include data reduction, data display, and conclusion drawing/ verification (Sarosa, 2021). The interview instruments are shown in Table 1.

Table 1
Interview instrument

No	Indicator	Question
1	Difficulty Understanding the Material	What do you think about students' difficulties in understanding the material being taught?
2	Use of Learning Methods	Are the learning methods you use effective?
3	Availability and Utilization of Learning Resources	Are the available learning resources sufficient to support the learning process?
4	Student Motivation And Engagement	How are student motivation and involvement during learning?
5	Learning Evaluation	How do you evaluate the success of the learning process?

Apart from using interview instruments, this research also uses observation to collect research data. The indicators of the observation instrument are in accordance with the interview indicators mentioned previously. Validation was carried out for the interview instrument and observation instrument with two validators to ensure the validity of the instrument.

RESULTS AND DISCUSSION

Based on field observations, the teaching and learning process, particularly in science, was found to be ineffective, with teachers primarily using a teacher-centered approach. This approach, which focuses on direct instruction from the teacher to the students, often leads to student passivity, especially in science, a subject closely tied to students' everyday lives. As defined by Plessis (2020), teacher-centered learning involves educators directing learning activities while students listen passively, hindering creativity and engagement. Although effective for teaching basic skills that require structured instruction, this approach limits students' active participation. It is recommended that teachers incorporate more sparking questions to encourage students to explore and understand the material independently, ensuring they gain meaningful learning experiences.

The students influenced the ineffectiveness of learning, as observed during the study, where they often ignored the teacher's instructions and engaged in written correspondence with one another instead of paying attention. Despite the classroom appearing conducive, this behavior likely masked their lack of engagement, with students attempting to deceive the teacher into thinking they were attentive. This passive behavior significantly impacted

their learning outcomes, as many struggled to answer questions. According to Ignatescu et al. (2021), the teacher's role should balance explaining the material and managing the classroom atmosphere. However, during this study, the teacher failed to actively monitor students' understanding, assuming that the classroom's appearance of orderliness indicated effective learning. Additionally, learning facilities, including classrooms and multimedia, play a crucial role in science education. Although the state elementary school Tersono has adequate facilities, their use is sometimes ineffective. Multimedia, such as simulations and virtual labs, can significantly enhance student motivation and independent learning (Abdulrahaman et al., 2020). When properly used, multimedia aids in both psychomotor and cognitive development, facilitating quicker comprehension of the material (Syah & Pertiwi, 2024). However, improper use of these tools can negatively impact student learning outcomes, highlighting the importance of their effective application in the classroom. Based on several statements that have been explained, it can be concluded that the use of media is very influential on the success of a lesson. However, behind the many benefits of learning media, improper use of media can also cause or affect student learning outcomes.

The inappropriate use of projector media causes students to become passive and not yet involved in learning. In the substance material given to class V students, the teacher only used a projector, where the teacher showed a video and PowerPoint presentation related to the material. Students only listen to the material so that interactive learning does not occur. Even though the teacher carries out questions and answers, this still seems less effective because the students are the only subjects who respond to the teacher's questions. No students actively ask questions or give opinions regarding the material that has been explained. The substance of the material explained is very closely related to students' daily lives, but teachers have not been able to maximize the learning facilities available in their environment. When teaching material, teachers should be able to choose several media that have been tested to be suitable, such as using crossword puzzle media (Fauzen et al., 2022) or using simple media such as posters. Learning can also be designed through *congklak* games (Nurfadhillah et al., 2021). Learning while playing can also increase students' motivation and enthusiasm for learning (Ratnawati & Asniawati, 2020).

Facilities in education extend beyond media to include classrooms and the school environment, which should be utilized effectively in science learning. Teachers should engage students with their surroundings by allowing them to observe the school environment, identify substances, and classify them, followed by presenting their findings in reports. This approach helps students become actively involved in learning and gain practical experience. To address challenges in science education, teachers can adopt appropriate learning approaches tailored to the material, sparking student interest and motivation from the outset. If students remain passive despite active approaches, teachers should analyze their behavior during class, such as talking with peers or falling asleep, to

identify the root causes. Furthermore, the use of learning media must align with the content; teachers should select media that encourage active participation, such as tools that allow students to conduct experiments, especially in science, which is closely related to natural phenomena and everyday life.

CONCLUSION

The research results indicate that the common problems in science learning at state elementary school Tersono include inappropriate teaching methods, such as the use of approaches that do not align with the learning material and methods that fail to engage students, leading to passivity in the classroom. Additionally, students themselves face difficulties in understanding the material, as evidenced by suboptimal learning outcomes, lack of participation, inattention during explanations, and minimal interaction with the teacher and peers. While the school provides adequate learning facilities, including clean, comfortable classrooms and sufficient media-like projectors, their use is not always optimal, affecting the quality of the learning process's quality. Based on these findings, it is recommended that teachers carefully select and adapt teaching methods, media, and approaches to better align with the material to improve student learning outcomes. Furthermore, teachers should work to motivate students to engage more actively in learning, fostering a more interactive and effective classroom environment.

ACKNOWLEDGEMENTS

The author thanks State University Muhammadiyah Kendal Batang for the support acknowledgments.

REFERENCES

Abdulrahaman, M. D., Faruk, N., Oloyede, A. A., Surajudeen-Bakinde, N. T., Olawoyin, L. A., Mejabi, O. V., Imam-Fulani, Y. O., Fahm, A. O., & Azeez, A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, *6*(11), Article e05312. 10.1016/j.heliyon.2020.e05312

Bereczki, E. O., & Kárpáti, A. (2021). Technology-enhanced creativity: A multiple case study of digital technology-integration expert teachers' beliefs and practices. *Thinking Skills and Creativity*, *39*, Article 100791. https://doi.org/10.1016/j.tsc.2021.100791

Dakhi, O. (2022). Implementasi model pembelajaran cooperative problem solving untuk meningkatkan kreativitas dan prestasi belajar [Implementation of cooperative problem solving learning model to improve creativity and learning achievement]. *Educare: Jurnal Pendidikan*, *1*(1), 8–15. https://doi.org/10.56248/educativo.v1i1.2

Fauzen, A., Roosyanti, A., & Desiningkrum, N. (2022). Jurnal pengembangan media crossword puzzle materi perubahan zat wujud benda kelas V SD Raden Patah Surabaya [Development of media crossword puzzle

material changes in the form of objects in class V SD Raden Patah Surabaya]. *Jurnal Inovasi Penelitian*, *3*(5), 6349–6360. https://doi.org/10.47492/jip.v3i5.2078

Ignatescu, C., Uredi, L., & Kosece, P. (2021). Ethical leadership role and behaviors of teachers in the context of effective classroom management. *Revista de Cercetare și Intervenție Socială*, *73*, 34-56.

Nurfadhillah, S., Saputra, T., Farlidya, T., Pamungkas, S. W., & Jamirullah, R. F. (2021). Pengembangan media pembelajaran berbasis media poster pada materi "Perubahan Wujud Zat Benda" kelas V di SDN Sarakan II Tangerang [Development of learning media based on poster media on the material "Changes in the Form of Objects" class V at SDN Sarakan II Tangerang]. *Nusantara*, *3*(1), 117–134.

Plessis, E. D. (2020). Student teachers' perceptions, experiences, and challenges regarding learner-centred teaching. *South African Journal of Education*, *40*(1), Article 1631. https://orcid.org/0000-0003-4299-4632

Ratnawati, E., & Asniawati, A. (2020). Pemberian motivasi melalui cerita dan games untuk menumbuhkan minat belajar anak usia SD dan SMP [Providing motivation through stories and games to foster interest in learning for elementary and junior high school age children]. *Dimasejati: Jurnal Pengabdian Kepada Masyarakat, 2*(2), 204–213.

Riswakhyuningsih, T. (2022). Pengembangan alur tujuan pembelajaran (ATP) mata pelajaran ilmu pengetahuan alam (IPA) kelas VII SMP [Development of the flow of learning objectives (ATP) for natural science subjects (IPA) class VII SMP]. *RISTEK: Jurnal Riset, Inovasi dan Teknologi Kabupaten Batang*, *7*(1), 20–30.

Sarosa, S. (2021). *Analisis Data Penelitian Kualitatif*. Pernerbit PT Kanisius.

Syah, M. E., & Pertiwi, D. S. (2024). *Psikologi Belajar* [Psychology of Learning]. Feniks Muda Sejahtera.

Pertanika Proceedings 1 (2): 73 - 77 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Internship Program for Preservice Teachers of Economics and Business: An Exploratory Study

Muhammad Bukhori Dalimunthe[1]*, Danny Ajar Baskoro[1], Riza Indriani[2], Haryadi[2] and Rosmala Dewi[3]

[1]Economics Department, Faculty of Economics, Universitas Negeri Medan, 20221, Medan, Indonesia
[2]Management Department, Faculty of Economics, Universitas Negeri Medan, 20221, Medan, Indonesia
[3]Guidance and Counseling Department, Faculty of Education, Universitas Negeri Medan, 20221, Medan, Indonesia

ABSTRACT

This study aims to explore internship programs for preservice teachers of economics and business at Universitas Negeri Medan. Students' perceptions were explored to assess their success in completing an internship program called the Program Lapangan Persekolahan (Field School Program). They collect information using a questionnaire based on learning outcomes mandated in the internship program. The questionnaire consists of 13 questions to explore their experience completing the internship program. This study involved 196 preservice teachers consisting of programs of economics education (n=49), accounting education (n=52), business education (n=44), and office administration education (n=51). Data analysis uses principal component analysis, which reduces all items and rotates them into new factors. The findings show that two new factors were formed, "observing the school environment" and "duration of the internship program ."It is crucial for lecturers to be well-prepared to guide students during internship programs. Students participating in such programs showed relatively equal abilities based on their scientific study program. The internship program helps develop students' abilities to become professional teachers, and university leaders can engage stakeholders to maximize its benefits. Scholars can explore the professional abilities of future teachers through experiments and instructional design, leading to enhanced competencies in preservice teachers.

Keywords: Duration, field school program, observation, preservice teachers, principal component analysis

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.013

E-mail addresses:
daliori86@unimed.ac.id (Muhammad Bukhori Dalimunthe)
ajarbaskoro@unimed.ac.id (Danny Ajar Baskoro)
rizaindriani@unimed.ac.id (Riza Indriani)
haryadi.fe@gmail.com (Haryadi)
ros_dw@unimed.ac.id (Rosmala Dewi)
* Corresponding author

e-ISSN: 3083-9475

INTRODUCTION

Vocational high school economic and business teachers are crucial for preparing students for future economic and business challenges, enhancing basic economic literacy and promoting continuous professional development through in-service training (Gyau et al., 2021). Vocational high schools offer practical skills through project-based learning and internships, preparing students for careers and contributing to economic development (Naima 2024). Additionally, the content of economics teacher education programs needs to be relevant to effectively teach senior school economics students (Bello, 2022). The literature highlights a theory-practice gap in teacher education, requiring practical experiences, metacognitive support, and effective pedagogical content integration to prepare teachers for classroom scenarios (Phillips & Condy, 2023). Research indicates that reflective practice is crucial for preservice teachers to critically analyze their teaching approaches and align them with theoretical frameworks (Dooly & Sadler, 2013). Partnerships and school-based teacher education programs help address the theory-practice gap in preservice teacher training (Melnyk 2022). Integrating reflective practices into internship programs can help students evaluate their teaching methods and align them with theoretical frameworks (Dooly & Sadler, 2013). Partnerships and school-based teacher education programs can bridge this gap (Melnyk, 2022). Internship programs significantly influence students' perceptions of teaching, impacting career decisions and professional growth (Dalimunthe, 2022). UNIMED is implementing a Field School Program to enhance teaching readiness, improve pedagogical skills, and deepen education understanding through internship programs for preservice economics and business teachers.

PROBLEM STATEMENT

This study investigates factors influencing the success of an economics and business preservice teacher internship program at Universitas Negeri Medan, focusing on student perceptions and support.

RESEARCH QUESTIONS

How do preservice teachers of economics and business at Universitas Negeri Medan perceive the effectiveness of Program Lapangan Persekolahan (Field School Program) in preparing them for professional teaching careers? The study involved 196 teaching students from Fakultas Ekonomi Universitas Negeri Medan, utilizing a quantitative design and survey approach to gather in-depth data on their experiences (Table 1).

Table 1
Question items covering various aspects of learning outcomes targeted in the internship program

Code	Variable and Question
X1	Student Interest *How would you rate your interest in the PLP 1 program?*
X2	Characteristics of Students *How do you assess the PLP 1 program as useful for describing student characteristics?*
X3	Organizational Structure and Work Procedures *Do you think the PLP 1 program is useful for describing the organizational structure and work procedures at partner schools?*
X4	Rules And Regulations *How do you assess the PLP 1 program as useful for describing rules and regulations in partner schools?*
X5	Ceremonial-Formal Activities at Partner Schools *How do you assess the PLP 1 program as useful for describing ceremonial-formal activities in partner schools? (for example, ceremonies, teachers' council meetings, Economic Subject Teachers' Deliberation meetings, and other ceremonial-formal activities)*
X6	Routine Intracurricular, Co-Curricular and Extracurricular Activities *How do you rate the PLP 1 program as useful for describing routine activities in the form of intracurricular (laboratory practice, remedial), co-curricular (for example, visits to museums, industry visits), and extracurricular (for example, football/basketball clubs, pencak silat, art, nature lover, scout) at partner schools?*
X7	Positive Habitual Practices *How do you assess the PLP 1 program as useful for describing positive habitual practices in partner schools? (for example, praying before learning activities, discipline, cleanliness, worship)*
X8	Preparation of Tutors In Guiding Students *How do you assess the preparation of tutors in guiding during the implementation of the PLP 1 program?*
X9	Preparation of Supervising Lecturers (DPL) *How do you assess the preparation of supervisory lecturers (DPL) in guiding during the implementation of the PLP 1 program?*
X10	Comfort and Convenience Facilities From Partner Schools *How do you assess the comfort and convenience of partner schools supporting the PLP 1 program?*
X11	Comfort and Convenience Facilities on Campus *How do you assess the comfort and convenience of campus facilities supporting the PLP 1 program?*
X12	Length of Time For Implementing *How do you assess the time needed to implement the PLP 1 program?*
X13	PLP Program as an Educational Experience *How would you rate the PLP 1 program as an educational experience that will help you do your job or assignment better?*

The Principal Component Analysis (PCA) technique was used to analyze questionnaire data, reducing 13 items into meaningful factors and establishing evaluation models for higher education systems. (Chen et al., 2021). The study shows that Principal Component

Analysis (PCA) is effective in predicting student performance and interpreting educational data patterns, especially when the Kaiser-Meyer-Olkin (KMO) metric exceeds 0.5. The study reveals a strong correlation between 13 variables, with "beneficial space" having the highest communalities value. Factors 1 and 2 contribute significantly to total variance (Sarstedt & Mooi, 2014). References like Ananda et al. (2022) discuss how the duration of internship programs significantly influences students' practical experience and teaching skills, preparing them for successful careers in Economics and Business.

The internship program emphasizes observing school environments to enhance preservice teachers' teaching strategies, student engagement, and classroom management, contextualizing theoretical knowledge and practical teaching approaches (Dube et al., 2023). This bridges the gap between theory and practice, improving teaching self-efficacy and instructional effectiveness (Halimi & Halimi, 2022). Internship program length affects preservice teacher learning. Longer programs lead to better understanding, feedback, skill development, and relationships. Research shows that longer internships improve learning and teaching skills (Bayer & Öner 2022). Internship programs in Economics and Business enhance teacher preparation by providing practical experience, observing school environments, and enhancing skills and professional insights for successful teaching careers.

CONCLUSION

The research on Universitas Negeri Medan's Faculty of Economics students' participation in the PLP 1 program enhanced their understanding of the school environment and provided a meaningful educational experience.

ACKNOWLEDGEMENT

This study expresses gratitude to Universitas Negeri Medan's leadership, preservice teachers, lecturers, supervisors, families, and friends for their support, resources, and insights on the internship program for preservice teachers, highlighting the importance of professional preparation.

REFERENCES

Ananda, G. C., Ramadhan, Z., Suwarno, B., & Alamsyah, B. (2022). Socialization of the international certified internship program in support of the merdeka belajar-kampus merdeka policy at the faculty of teacher training and education, santo thomas catholic university, medan. *International Journal of Community Service*, *2*(3), 344-347. https://doi.org/10.51601/ijcs.v2i3.112

Bayer, G., & Öner, D. (2022). The role of a virtual internship in developing preservice teachers' technological pedagogical content knowledge. *Boğaziçi Üniversitesi Eğitim Dergisi, 39*(1),81–104. https://doi.org/10.52597/buje.978272

Bello, M. B. (2022). Relevance of economics teacher education curriculum contents in the teaching of senior school economics in Nigeria. *KDU Journal of Multidisciplinary Studies*, *4*(2), 30-42. https://doi.org/10.4038/kjms.v4i2.49

Chen, Z., Han, Y., Liu, G., & Yu, J. (2021, June 28-30). Visual analysis of the education system's potential value by PCA model. [Paper presentation]. *IEEE International Conference on Artificial Intelligence and Computer Applications (ICAICA)*, Dalian, China. https://doi.org/10.1109/ICAICA52286.2021.9497982

Dalimunthe, M. B. (2022). Kirkpatrick four-level model evaluation: An evaluation scale on the preservice teacher's internship program. *Journal of Education Research and Evaluation*, *6*(2), 367-376. https://doi.org/10.23887/jere.v6i2.43535

Dooly, M., & Sadler, R. (2013). Filling in the gaps: Linking theory and practice through telecollaboration in teacher education. *ReCALL*, *25*(1), 4-29. https://doi.org/10.1017/s0958344012000237

Dube, C. M., Mncube, D., & Uleanya, C. (2023). Exploring preservice teachers' classroom management skills during teaching practice: Perspectives of university supervisors. *Space and Culture, India*, *11*(1), 56-67. https://doi.org/10.20896/saci.v11i1.1313

Gyau, E. B., Osei-Mensah, J., Amonoo, G., & Akowuah, S. (2021). Evaluating the effectiveness of teaching economics at the senior high school level. *International Journal of Research and Innovation in Social Science*, *5*(8), 93-103. https://doi.org/10.47772/ijriss.2021.5806

Halimi, F., & Halimi, R. (2022). Pre-service teachersâ€™ perceptions on active learning strategies in online classrooms. *Journal of Educational and Social Research, 12*(5), 222-234. https://doi.org/10.36941/jesr-2022-0136

Melnyk, O. (2022). Improving governance of vocational teacher education in Ukraine within Erasmus+ project. In *8th International Conference on Higher Education Advances (HEAd'22)* (pp. 331-338). Editorial Universitat Politècnica de València. https://doi.org/10.4995/head22.2022.14648

Naima, S., Khatun, H., & Gurung, S. (2022). The ability of students in the hospitality accommodation program at vocational high school to write paragraphs wsing english terms in the food and beverage service subject. *Journal Evaluation in Education (JEE)*, *3*(4), 130-134. https://doi.org/10.37251/jee.v3i4.934.

Phillips, H. N., & Condy, J. (2023). Pedagogical dilemma in teacher education: Bridging the theory practice gap. *South African Journal of Higher Education*, *37*(2), 201-217. https://doi.org/10.20853/37-2-4610.

Sarstedt, M., & Mooi, E. (2014). Factor analysis. In *A Concise Guide to Market Research: The Process, Data, and Methods Using IBM SPSS Statistics* (pp. 235-272). Springer.

Pertanika Proceedings 1 (2): 79 - 83 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Development of Digital Story Maps Learning Media with My Maps in History Learning

Najuah Najuah*, Ricu Sidiq, Fanny Iswandari, Pristi Suhendro Lukitoyo and Muhammad Ihsan Syahaf Nasution

Universitas Negeri Medan, Education History Department, Faculty of Social Sciences, 20371, Medan, Indonesia

ABSTRACT

This study aims to develop a Digital Story Maps learning media based on My Maps on the material of events surrounding the proclamation of Indonesian independence, determine the feasibility of the Digital Story Maps learning media, and determine the effectiveness of Digital Story Maps. This type of research uses the Research and Development (R&D) research method using the ADDIE development model, expert with a percentage of 89.46%; the validation of the media expert obtained a presentation score of 88.22% with the category "Very Valid." Learning outcomes that have been successfully achieved if >72% of students reach the standard score of 75. An effectiveness test was carried out to achieve this through a pretest and posttest, showing that student learning outcomes were more effective using Digital Story Map learning media than without history learning media that only used printed media. The pretest value was 65%, while the posttest was 85%. The digital history learning media story map on the proclamation event material is very feasible to be used in the history learning process.

Keywords: Digital maps, digital story maps, learning media

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.014

E-mail addresses:
najuah@unimed.ac.id (Najuah Najuah)
ricusidiq@unimed.ac.id (Ricu Sidiq)
fannyiswandari495@gmail.com (Fanny Iswandari)
Pristisuhendro@unimed.ac.id (Pristi Suhendro Lukitoyo)
Ihsansyahafnasution@unimed.ac.id (Muhammad Ihsan Syahaf Nasution)
* Corresponding author

INTRODUCTION

Education is a vital human endeavor aimed at developing physical and spiritual potential within societal and cultural values (Hasan et al., 2023; Tsauri, 2015, p. 3). It profoundly influences various aspects of life, including social, economic, political, cultural, and religious dimensions. Quality education leads to the successful development of

e-ISSN: 3083-9475

human resources (Juita et al., 2024; Mundir, 2022; Siahaan et al., 2023), prompting individuals to pursue their educational goals actively.

Advancements in science and technology significantly shape education today, integrating information and communication technologies into teaching methods (Nucifera et al., 2022; Pérez-Antón et al., 2024; Yuberti et al., 2015). Aligning educational progress with technological development is crucial for enhancing learning quality, and effective learning media play a vital role in engaging students and improving educational outcomes (Carstens, 2021; Lazar, 2015; Mfreke & Bassey, 2020; Qureshi et al., 2021; Susilo et al., 2023). Therefore, teachers must be able to integrate technological advancements into their teaching (Hasan, 2019; Mishra & Mehta, 2017; Juárez-Varón et al., 2024; Marpelina et al., 2024).

History education is critical in teaching students about past events and their connection to present and future realities. It aims to cultivate historical thinking, character development, and a sense of nationalism among students (Dewanto et al., 2023; Jumardi, 2017; Lisnawati et al., 2022; Maulani et al., 2022; Purni 2023; Sumargono et al., 2022). Initial research conducted at SMA PAB 4 Sampali revealed that the XI grade curriculum relies on conventional lecture methods and PowerPoint presentations, failing to engage students effectively. Many students expressed a preference for more interactive learning methods, such as videos and games. The traditional teacher-centered approach has decreased student interest and participation, with only about 50% meeting minimum competency standards.

PROBLEM STATEMENT

Although education plays an important role in the development of human potential, especially through learning history at SMA PAB 4 Sampali, the use of conventional teaching methods, such as lectures, and limited learning media (such as textbooks and PowerPoint) has led to low student interest and participation in learning. Initial research results show that many students feel bored and less engaged in the history learning process, with only about 50% of students achieving the Minimum Completion Criteria (KKM) in school exams. The lack of variety in interactive and engaging learning media hinders the effectiveness of history learning, which is indispensable for building students' character and national awareness.

RESEARCH QUESTIONS

This research question is (1) What is the validity of Digital Story Maps with My Maps in History Learning? and (2) How is the effectiveness of Digital Story Maps with My Maps in History Learning?

This research will use the research and development method and development model ADDIE, which produces a product and evaluates and tests its effectiveness. The product

in this study is Digital Story Maps Learning Media using My Maps on historical materials, namely, the proclamation of Indonesia's independence. The data collection instruments compiled in this study are a Questionnaire and a test.

The Digital Story Maps learning media has undergone a series of developments, including feasibility and effectiveness tests, confirming its practicality and effectiveness in enhancing student learning outcomes, particularly for grade XI history subjects. Validation results indicate that this media effectively addresses students' challenges by incorporating engaging elements such as videos, photos, materials, and evaluations, allowing students to learn through audio, visual, and audiovisual methods.

The validation of the expert with a percentage of 89.46% and the validation of the media expert obtained a presentation score of 88.22% with the category "Very Valid." Learning outcomes that have been successfully achieved if >72% of students reach the standard score of 75. An effectiveness test was carried out to achieve this through a pretest and posttest, showing that student learning outcomes were more effective using Digital Story Map learning media than without history learning media that only used printed media. The pretest value was 65%, while the posttest was 85%.

This media goes beyond merely showing the locations of historical events; it presents a clear sequence of events, including introductory materials and explanatory videos. Students can access the content independently on their smartphones, laptops, or computers, not just in school with teacher guidance. The testing results align with Edgar Dale's theory, which emphasizes that students learn best through direct experience, observation, and interaction with various media. The Digital Story Maps facilitate this by providing concrete knowledge that is easy to understand, filling the gap where direct experience is not feasible.

The Digital Story Maps learning media utilizes verbal and visual symbols, audio recordings, and moving images to create an engaging learning experience. It has received high validation scores, demonstrating strong feasibility and effectiveness, especially in teaching historical events related to the proclamation. This media enhances student learning outcomes and significantly improves engagement and interest in history subjects developed through various feasibility and effectiveness tests. It includes videos, photos, materials, and evaluations, allowing for audio, visual, and audiovisual learning. Students can access the content independently on their smartphones, laptops, or computers, making it a versatile resource beyond classroom settings.

CONCLUSION

This research and development resulted in a Digital Story Maps learning media product with a development model, namely ADDIE. This learning media contains short materials, videos that complement the material, and pictures. It is a website that requires students to be connected to the internet network. The results of the research obtained by the author

show that the Digital Story Maps learning media is suitable for use as a learning medium in teaching and learning activities. The Story Maps Digital learning media developed has improved students' learning outcomes in learning history. The effectiveness of Story Maps Digital learning media was analyzed based on the pretest and posttest results, which obtained scores of 45 and 82, respectively.

ACKNOWLEDGEMENT

First, we thank the Institute for Research and Community Service of Medan State University for providing grant funding for our previous research (Najuah, 2024) under the Applied Product Research scheme in 2024. Furthermore, we would also like to express our most profound appreciation to the students, teachers, and schools to whom the research has devoted their time, energy, and thoughts so that this research can be implemented

REFERENCES

Carstens, K. J. (2021). Effects of technology on student learning. *The Turkish Online Journal of Educational Technology, 20*(1), 105–113.

Dewanto, R., Ramadhan, A. R., Firdaus, F. F., Mozrapa, E. S., & Hidayat, T. (2023). Fostering National Character Attitudes Through History Education in the 21st Century Disruption Era. *Ideas: Jurnal Pendidikan, Sosial, Dan Budaya*, *9*(2), 343. https://doi.org/10.32884/ideas.v9i2.1307

Hasan, M., Nasution, N., Sofyan, S., Guampe, F. A., Rahmah, N., Mendo, A. Y., Elpisah, E., Musthan, Z., Sulistyowati, R., Kamaruddin, C. A., Ratnah, R., Sartika, S. B., Suarlin, S., Astuty, S., Khasanah, U., Supatminingsih, T., Tahir, T., Hasyim, S. H., Ahmad, M. I. S., … & Atirah, A. (2023). *Education and Human Resources: Conceptualizing the Role of Education in Shaping Human Capital*. Tahta Media Group.

Hasan, S. H. (2019). History Education for 21st Century Life. *HISTORIA*, *II*(2), 61–72.

Juárez-Varón, D., Juárez-Varón, M. Á., Mengual-Recuerda, A., & Andres, B. (2024). A neurotechnological study to quantify differences in brain activity using game-based learning: gamification vs. traditional teaching. *International Journal of Game-Based Learning*, *14*(1), Article 20. https://doi.org/10.4018/IJGBL.349219

Juita, D. P., Priya, P., Azwardi, M., & Amra, A. (2024). The Importance of human resource development in educational institutions. *Indo-MathEdu Intellectuals Journal*, *5*(3), 3068–3077. https://doi.org/10.54373/imeij.v5i3.1243

Jumardi, J. (2017). The role of history lessons in character development through local historical values-based learning in senior High School 65 West Jakarta. *Jurnal Pendidikan Sejarah*, *6*(2), 70–80. https://doi.org/10.21009/jps.062.08

Lazar Stošić. (2015). The importance of educational technology in teaching. *International Journal of Cognitive Research in Science, Engineering and Education, 3*(1), 111–114.

Lisnawati, A., Asyahidah, N. L., & Arifin, M. H. (2022). The role of history learning in nationalism character building in students. *MAHAROT: Journal of Islamic Education*, *6*(1), 2580–3999. http://ejournal.idia.ac.id/index.php/maharot

Marpelina, L., Sariyatun, & Andayani. (2024). Revolutionizing History Learning in The Digital Era: Transforming the Way We Learn. *KnE Social Sciences*. https://doi.org/10.18502/kss.v9i2.14910

Maulani, M., Umasih, U., & Rochalina, C. I. (2022). Internalization of the character of nationalism through learning in schools: Implementation and challenges. *Journal of Education Research and Evaluation*, *6*(1), 53–62. https://doi.org/10.23887/jere.v6i1.38300

Mfreke, U. D., & Bassey, M. (2020). Teaching and learning with media technology. *Novateur Publications International Journal of Innovations in Engineering Research and Technology*, *7*(5), 2394–3696.

Mishra, P., & Mehta, R. (2017). What we educators get wrong about 21st-century learning: Results of a survey. *Journal of Digital Learning in Teacher Education*, *33*(1), 6–19. https://doi.org/10.1080/21532974.2016.1242392

Mundir. (2022). *Educational Technology: An Introduction*. Edulitera.

Nucifera, P., Yakob, M., & Setyoko, S. (2022). Digital-based learning media training for teachers at SMPN 1 Rantau Selamat, East Aceh. *Jurnal Pengabdian Pada Masyarakat, 3*(2), 217-255. https://doi.org/10.29408/ab.v3i2.6277

Purni, T. (2023). The importance of history education as a strengthening factor of character-building education. *Jurnal Pendidikan Sejarah & Sejarah FKIP Universitas Jambi*, *2*(1), 190–197.

Qureshi, M. I., Khan, N., Raza, H., Imran, A., & Ismail, F. (2021). Digital technologies in education 4.0. does it enhance the effectiveness of learning? *International Journal of Interactive Mobile Technologies*, *15*(4), 31–47. https://doi.org/10.3991/IJIM.V15I04.20291

Pérez-Antón, R., López-Sánchez, J. I., & Corbi, A. (2024). The game theory in quantum computers: A review. *International Journal of Interactive Multimedia and Artificial Intelligence*, *8*(4), 6–13. https://doi.org/10.9781/ijimai.2023.09.001

Siahaan, A., Akmalia, R., Ray, A. U. M., Sembiring, A. W., & Yunita, E. (2023). Efforts to improve education quality in Indonesia. *Journal on Education*, *5*(3), 6933–6941. https://doi.org/10.31004/joe.v5i3.1480

Sumargono, S., Basri, M., Istiqomah, I., & Triaristina, A. (2022). Students' critical thinking skills in history subject. *Tarbiyah Wa Ta'lim: Jurnal Penelitian Pendidikan dan Pembelajaran, 9*(3)141–149. https://doi.org/10.21093/twt.v9i3.4508

Susilo, M. J., Sulisworo, D., & Beungacha, S. (2023). Technology and its impact on education. *Buletin Edukasi Indonesia*, *2*(2), 47–54. https://doi.org/10.56741/bei.v2i02.285

Tsauri, S. (2015). *Character Education Opportunities in Building National Character.* IAIAN Jember Press.

Yuberti, Haryanto, & Chaniago, S. (2015). The dynamics of educational technology. *Lembaga Penelitian Dan Penerbitan LP2M IAIN Raden Intan Lampung*, *8*(2), Article 295.

Pertanika Proceedings 1 (2): 85 - 89 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Numeracy Literacy Educational Game-based RPG Maker MV in Elementary Schools

Novia Frisda Eldiana[1]*, Mohammad Zainuddin[2] and Slamet Arifin[3]

[1]State University of Malang, Primary Education Master Program, Post-Graduate School, 65145, Malang, Indonesia
[2]State University of Malang, Indonesian Literature Department, Faculty of Letters, 65145, Malang, Indonesia
[3]State University of Malang, Post-Graduate School, 65145, Malang, Indonesia

ABSTRACT

This research discusses the implementation of numeracy literacy in mathematics learning into educational games based on RPG Maker MV for elementary school students. Technological advances allow game-based learning to come in various genres and can be created by anyone with any background, including those involved in the world of education. By implementing numeracy literacy and challenge games into the learning process, students become more active and improve student learning outcomes, and teachers continue to play an active role as facilitators. This research aims to design an educational game that includes numeracy literacy and is created using the RPG Maker MV application to improve students' HOTS abilities in mathematics subjects. This research uses the Nieveen model for game development. In this research, integrating RPG-based educational games into numeracy literacy in mathematics learning went well in designing teaching materials, challenges, and questions. The effectiveness of the RPG Maker MV-based numeracy literacy game based on the results of working on the hottest posttest questions has met the effective criteria. This research can be complementary in terms of educational games, numeracy literacy, and HOTS questions.

Keywords: Game, numeracy literacy, RPG maker MV

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.015

E-mail addresses:
novia.frisda.2221038@students.um.ac.id (Novia Frisda Eldiana)
mohammad.zainuddin.fip@um.ac.id (Muhammad Zainuddin)
slamet.arifin.pasca@um.ac.id (Slamet Arifin)
* Corresponding author

INTRODUCTION

The report card score for students' numeracy literacy skills at an elementary school in Durenan District is 1.88, indicating they are at a professional level (Hapsari, 2023). The school's numeracy literacy score has improved, but more students

e-ISSN: 3083-9475

need proficiency. The school connects numeracy with learning but does not fully utilize resources like computer labs. Syaifudin (2022) states that innovative teaching methods using "PEGALINU" media can significantly improve students' numeracy literacy skills, as evidenced by statistical values in Budiningtyas et al. (2022). Game-based learning to improve numeracy literacy has also been carried out (Ulfa et al., 2022), showing that initial results were 53% but increased to 89% after game-based learning at Nurul Muttaqin Islamic Elementary School, Malang City.

Numeracy literacy skills are directly proportional to students' HOTS abilities, requiring higher-order thinking in solving problems presented by PISA. by Novitasari (2022). When students' level of numeracy literacy skills is not optimal, students will experience problems in working on HOTS questions (Pramesthi et al., 2022). Interviews and research indicate that the school needs literacy-based games to enhance students' numeracy literacy skills, preparing them for everyday life and AKM activities, replacing the National Examination in 2021.

AKM measures two types of literacy: reading and numeracy (Sulistyani & Kusumawardana, 2022). The main focus of AKM is to fulfill students' reading and numeracy literacy skills. The focus of the discussion this time is on numeracy literacy. Numeracy literacy is one of the essential literacies that needs to be mastered to face the era of Industrial Revolution 4.0, known as the 21st century. Learning media, like RPG Maker MV, has been developed to enhance elementary school students' numeracy literacy, particularly in mathematics learning about Multiples and Factors.

RESEARCH QUESTIONS

The study explores the impact of game-based learning on student engagement and learning outcomes in elementary school mathematics. It involves prototyping a numeracy literacy game using RPG Maker MV, focusing on middle-category schools. The research includes interviews, questionnaires, and question sheets, and includes a literature survey and problem analysis.

The game enhances students' numeracy literacy skills by allowing them to solve mathematical problems, analyze information, and form opinions using FPB material for class V elementary school. Based on the results of the data obtained by referring to the stages of prototyping model development (Nieveen et al., 1999), Mathematics teachers in schools are implementing numeracy literacy learning activities, but Chromebook-based games are lacking. A role-playing game (RPG) is developed, featuring a young man treating a virus in a village, forest, and maze.

Three indicators of numeracy literacy are taken from Nadjamuddin and Hulukati (2022). This game enhances students' numeracy literacy skills by allowing them to answer mathematical problems, analyze information, and form opinions—the draft I is validated

by draft material and media experts. The media expert validated the RPG Maker MV 85.7 numeracy literacy game, stating its ease of use, adaptability to school media availability, and accompanying guidebook. Mathematics games with visually appealing appearances, interactive writing, and creative ideas enhance students' understanding of subject matter through easy-to-understand content and images. Wulandari et al. (2023) stated that symbols and visual images make it easier for students to achieve goals and understand and remember the information and messages in the photos. Material validation in numeracy literacy games involves material, language, and practicality. A lecturer with mathematics expertise scored 91.6, while a teacher of class V scored 88.9. Material aspects enhance transparency in conveying material through stories and pictures. Games are also linked to everyday life problems to make it easier for students to understand the game's conditions and apply similar things (Muna et al., 2023). Effective use of sentences can make it easier for students to understand the game's instructions and clarify the material.

The validator deemed the numeracy literacy game based on RPG Maker MV "very valid" but suggested improvements. Testing with class V students at SDN Baruharjo was convenient for students and teachers. It is based on research by Fareza and Zuhdi (2023), which states that learning media that can be used on Chromebooks is practically used in the learning process in elementary schools. Web-based digital learning has been proven to increase student involvement in learning (Arifin et al., 2023). The research results show that developing a numeracy literacy game using RPG Maker MV for elementary school students enhances their learning experience, promotes active and independent learning, and helps them understand and apply concepts in everyday life. The results of this research are consistent with research by Sari Widodo (2021)

The Nieveen model was utilized to evaluate the effectiveness of a numeracy literacy game in enhancing students' higher-order thinking skills, with four out of 27 students achieving an 80 KKM score. So, learning with digital games is more effective in learning and obtaining grades than the non-game application approach (Fitriati et al., 2021). Digital learning has been proven to increase student engagement in learning (Arifin et al., 2023). Based on these two statements, the learning process using game-based games is more effective if used in the learning process.

CONCLUSION

The research shows that educational games based on numeracy literacy are valid, practical, and effective in teaching and learning. Based on RPG Maker MV, the game increases problem-based learning (HOTS) for elementary school students, making them more motivated and familiar with symbols.

ACKNOWLEDGEMENT

The author thanks Beasiswa Pendidikan Indonesia (BPI) and Lembaga Pengelola Dana Pendidikan (LPDP) for the sponsor and financial support acknowledgments.

REFERENCES

Arifin, S., Razali, F. B., & Rahayu, W. (2023). Integrating PhET interactive simulation to enhance students' mathematical understanding and engagement in learning mixed fraction. *Al Ibtida: Jurnal Pendidikan Guru MI*, *10*(2), 241-252.

Budiningtyas, A. K., Utaminingsih, S., & Fajrie, N. (2022). Pengembangan media "Pegalinu" dalam kemampuan literasi digital dan numerasi dasar Kelas III di SDSe-Gugus Wibisono Kecamatan Jati Kabupaten Kudus [Integrating PhET interactive simulation to enhance students' mathematical understanding and engagement in learning mixed fraction]. *Jurnal Ilmiah Wahana Pendidikan, 8*(18), 1–10. https://doi.org/10.5281/zenodo.7133904

Fareza, H. I., & Zuhdi, U. (2023). Development of Nearpod-based interactive learning media in plant breeding material for grade VI elementary school students. *JPGSD: Journal of Research on Primary School Teacher Education. 11*(1), 11-21. doi:http://dx.doi.org/10.29300/ijisedu.v5i2.11026

Fitriati, I., Purnamasari, R., Fitrianingsi, N. F., & Irawati, I. (2021). Implementasi digital game based learning menggunakan aplikasi educandy untuk evaluasi dan motivasi belajar mahasiswa bima [Implementation of digital game based learning using educandy application for evaluation and learning motivation of bima students]. *Prosiding Penelitian Pendidikan dan Pengabdian*, *1*(1), 307-312.

Hapsari, N. T. M. W. (2023). Inovasi pembelajaran matematika dalam implementasi kurikulum merdeka di SMKN 1 Surakarta sebagai sekolah pusat keunggulan [Mathematics learning innovation in implementing Merdeka curriculum at SMKN 1 Surakarta as a centre of excellence school]. *Jurnal Pendidikan Indonesia, 4*(02), 104–111. https://doi.org/10.59141/japendi.v4i02.1562

Muna, N., Ermawati, D., & Kironoratri, L. (2023). Penggunaan model realistic mathematics educationdalam meningkatkan kemampuan numerasi pada siswa Kelas V SD 1 peganjaran [The use of the realistic mathematics education model in improving numeracy skills in students V Grade]. *Jurnal Pendidikan Dasar Flobamorata, 4*(3), 681-688. https://doi.org/10.51494/jpdf.v4i3.1097

Nadjamuddin, A., & Hulukati, E. (2022). Kemampuan literasi numerasi mahasiswa dalam menyelesaikan masalah matematika [Students' numeracy literacy skills in solving mathematics problems]. *Jurnal Basicedu*, *6*(1), 987-996. https://doi.org/10.31004/basicedu.v6i1.1999

Nieveen, N. (1999). *Prototyping to React Product Quality: Design Approaches and Tools in Education and Training*. Kluwer Academic Publisher.

Novitasari, M. (2022). Pengembangan lembar kerja peserta didik: Membudayakan literasi numerasi siswa sekolah dasar [Development of learner worksheets: Cultivating numeracy literacy in primary school students]. In S. Sutama, H. N. Damayanti (Eds.) *Prosiding Seminar Nasional Pembelajaran Matematika* (pp. 74–86). Fira Himara.

Pramesthi, R. I., Suryatin, S., & Erviana, L. (2022). Analisis kemampuan literasi numerasi dalam menyelesaikan soal hots materi bangun ruang siswa kelas V SD [Analysis of numeracy literacy skills in solving hots

questions on building space material for grade V SD elementary school students]. *Scholarly Journal of Elementary School, 2*(2), 81-90. https://doi.org/10.21137/sjes.2022.2.2.3

Sari, A. P., & Widodo, T. (2021). Rancang bangun pengenalan pariwisata lampungdengan game edukasi berbasis android [Designing an introduction to Lampung tourism with an android-based educational game]. *Jurnal Edukasimu, 1*(1), 1-10.

Sulistyani, N., & Kusumawardana, A. S. (2022). Pendampingan pengembangan instrumen berciri literasi numerasi dalam menyiapkan AKM pada guru SD [Assistance in developing instruments characterised by numeracy literacy in preparing AKM for primary school teachers]. *Jurnal Pemberdayaan Masyarakat Berkarakter, 4*(2), 249-260.

Syaifudin, M. (2022). Efektivitas e-lkpd berbasis stem untuk menumbuhkan ketermapilan liteasi numerasi dan sains dalam pembelajaran listrik dinamis di SMA Negeri 1 Purbalingga [Effectiveness of stem-based E-LKPD to foster numeracy and science skills in dynamic electricity learning at SMA Negeri 1 Purbalingga]. *Jurnal Riset Penididikan Indoensia, 2*(2), 211–220.

Ulfa, E. M., Nuri, L. N., Sari, A. F. P., Baryroh, F., Ridlo, Z. R., & Wahyuni, S. (2022). Implementasi game based learning untuk meningkatkan kemampuan literasi dan numerasi siswa sekolah dasar [Implementation of game-based learning to improve literacy and numeracy skills of primary school students]. *Jurnal Basicedu, 6*(6), 9344–9355. https://doi.org/10.31004/basicedu.v6i6.3742

Wulandari, A. P., Salsabila, A. A., Cahyani, K., Shofiah Nurazizah, T., & Zakiah, U. (2023). Pentingnya media pembelajaran dalam proses belajar mengajar [The importance of learning media in the teaching and learning process]. *Journal on Education, 5*(2), 3928–3936. https://doi.org/10.31004/joe.v5i2.1074

Pertanika Proceedings 1 (2): 91 - 95 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Enhancing Vocational Education in Computer Science: Implementing the Discrepancy Evaluation Model (DEM) for Quality Assurance

Putrinda Inayatul Maula[1]*, Hakkun Elmunsyah[1], Yoto[2], Wahyu Sakti Gunawan Irianto[1] and Siti Salina Mustakim[3]

[1]Universitas Negeri Malang, Department of Electrical Engineering and Informatics, Faculty of Engineering, 65145 Malang City, East Java, Indonesia
[2]Universitas Negeri Malang, Department of Mechanical and Industrial Engineering, Faculty of Engineering, 65145 Malang City, East Java, Indonesia
[3]Universiti Putra Malaysia, Faculty of Education Studies, 43400 Serdang Selangor, Malaysia

ABSTRACT

Vocational education is essential for developing human resources to support national progress. However, aligning academic curricula with industry needs is a significant challenge that impacts vocational education quality. This study uses a quantitative approach to evaluate the quality assurance of vocational education in computer science using the Discrepancy Evaluation Model (DEM) and information technology. Results reveal that learners reacted positively to curriculum and policy changes despite variations in technology infrastructure and experiences with online platforms. Training sessions received favorable feedback, although adherence to technology policies was inconsistent. The integration of information technology in learning was deemed beneficial for enhancing the quality of education and improving students' skills, although challenges remain. These findings underscore the necessity for continuous evaluation to enhance quality assurance in vocational education through information technology, ensuring alignment with industry demands and adequately preparing students for the digital age.

Keywords: DEM, quality assurance, vocational education

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.016

E-mail addresses:
putrinda.inayatul.ft@um.ac.id (Putrinda Inayatul Maula)
hakkun@um.ac.id (Hakkun Elmunsyah)
yoto.ft@um.ac.id (Yoto)
wahyu.sakti.ft@um.ac.id (Wahyu Sakti Gunawan Irianto)
mssalina@upm.edu.my (Salina Mustakim)
* Corresponding author

INTRODUCTION

Vocational education is crucial for economic progress and workforce development in Asia, with countries like South Korea, Japan, and Singapore implementing dual education systems to create employable graduates while maintaining relevance to industry needs. (Rakhmankulovna 2023)

e-ISSN: 3083-9475

Vocational education aims to create a well-prepared workforce for industry requirements. However, challenges include misalignment between academic curricula and industry needs, leading to graduates lacking the necessary skills and hindering their smooth integration into the workforce. (Ayonmike et al., 2015; Kovalchuk et al., 2022; Wafudu et al., 2022).

The Indonesian government is enhancing vocational education quality through revitalization and link and match policies, aligning with industry needs for economic growth and workforce development. (Gasmelseed, 2021) This research assesses quality assurance in computer science vocational education using IT, identifying strategies for improving quality and recommending a comprehensive curriculum integrating TVET policies. The study emphasizes the importance of soft skills, a robust framework, advisory boards, and mandatory internships in computer science vocational education. (Arifudin et al., 2022; Handoyono, 2022). It evaluates curriculum alignment, technology infrastructure, online learning platforms, and skills enhancement, using the Discrepancy Evaluation Model to assess performance and identify deviations (Qarni et al., 2022).

RESEARCH QUESTIONS

How does the use of the Discrepancy Evaluation Model (DEM) assess the quality assurance of vocational education in computer science?

The study utilized the Discrepancy Evaluation Model (DEM) to evaluate the quality assurance of vocational education, utilizing validated questionnaires and quantitative descriptive analysis (John & Yusri, 2021). The study analyzed the effectiveness of quality assurance in 38 students from East Java's IT and Computer Science vocational schools through pre-fieldwork, fieldwork, and data analysis (Cheung, 2020; Darteh, 2021). The study shows learners want curriculum changes for the digital era but worry about infrastructure quality. 74% see a positive impact of IT policies. (Purnami et al., 2021).

Learners believe policy design enhances learning by improving accessibility, efficiency, and effectiveness with online resources and technology. Barriers may include accessibility issues and inadequate infrastructure. The variations could indicate different learning styles and should be taken into account when creating IT policies in education (Cheng et al., 2022). Learners generally have positive experiences with technology infrastructure in their institutions, focusing on accessibility, speed, and reliability (Adekola et al., 2017; Benavides et al., 2020). However, they may encounter constraints like slow internet connections and technical problems. Understanding learners' needs and experiences is crucial for effective management (Asad et al., 2023).

Online platform integration in education has generally positive experiences, enhancing engagement, access to learning materials, and understanding (Asiyai, 2022). However, challenges like technical issues, navigation difficulties, and lack of support can hinder learning. Learning preferences and alignment between platforms and materials also impact

engagement. Well-designed platforms tailored to learners' needs are more effective in achieving learning objectives (Awang-Hashim et al., 2019; Khan et al., 2017). Considering learners' needs, preferences, and experiences is crucial for effective strategies in education.

Learners appreciate information technology training for its efficiency, productivity, and work quality, valuing well-designed, tailored education in the digital era (Marjona, 2024). Information technology in education enhances scientific understanding and engagement and deepens understanding through relevant applications and software, aligning with the growing trend of technology adoption in education.

Learners believe existing policies align with their needs and expectations for using information technology, promoting adherence to established rules (Espinoza & Martinez, 2023). Continuous assessment of technology use is crucial to maximize its positive impact on learning quality, engagement, and academic achievement despite variations in perceptions and institutional contexts (Asiyai, 2022). Learners reported positive experiences with digital tools, enhancing understanding and skills, improving proficiency, increasing efficiency, and providing access to resources but faced challenges or felt technology did not yield significant benefits (Greere, 2023).

CONCLUSION

Information technology enhances the quality of computer science education, but learners' responses vary. Institutions should improve infrastructure, provide training, and implement diverse policies while strengthening industry cooperation and continuous staff training.

ACKNOWLEDGEMENT

The authors would like to thank the informants who participated in this study.

REFERENCES

Adekola, J., Dale, V. H., & Gardiner, K. (2017). Development of an institutional framework to guide transitions into enhanced blended learning in higher education. *Research in Learning Technology, 25,* Article 1973. https://doi.org/10.25304 /rlt.v25.1973.

Arifudin, O., Trisnamansyah, S., & Sauri, R. S. (2022). Implementation of internal quality assurance system in order to improve the quality of polytechnical research. *International Journal of Social Science, Education, Communication and Economics (SINOMICS JOURNAL), 1*(3), 297-306. https://doi.org/10. 54443/sj.v1i3.39.

Asad, M. M., Mahar, P., Datoo, A. K., Sherwani, F., & Hassan, R. (2023). Impact of quality assurance on TVET programs for the digital employment market of IR 4.0 in Pakistan: A quantitative investigation. *Education+ Training, 65*(6/7), 891-908. https://doi.org/10.1108/ET-08-2022-0295.

Asiyai, R. I. (2022). Best practices for quality assurance in higher education: implications for educational administration. *International Journal of Leadership in Education, 25*(5), 843-854. https://doi.org/10.1080/13603124.2019.1710569

Awang-Hashim, R., Kaur, A., & Valdez, N. P. (2019). Strategizing inclusivity in teaching diverse learners in higher education. Malaysian *Journal of Learning and Instruction, 16*(1), 105-128. https://doi.org/10.32890/mjli2019.16.1.5

Ayonmike, C. S., Okwelle, P. C., & Okeke, B. C. (2015). Towards quality technical vocational education and training (Tvet) programmes in Nigeria: Challenges and improvement strategies. *Journal of Education and Learning, 4*(1), 25-34.

Benavides, L. M. C., Arias, J. A. T., Serna, M. D. A., Bedoya, J. W. B., & Burgos, D. (2020). Digital transformation in higher education institutions: A systematic literature review. *Sensors, 20*(11), 3291. https://doi.org/10. 3390/s20113291

Cheng, M., Adekola, O., Albia, J., & Cai, S. (2022). Employability in higher education: A review of key stakeholders' perspectives. *Higher Education Evaluation and Development*, *16*(1), 16-31. https://doi.org/10.1108/ HEED-03-2021-0025

Cheung, R. W. Y. (2020). Quality assurance in vocational higher education: A case of Macau. *Journal of Advances in Humanities and Social Sciences, 6*(3), 89-99. https://doi.org/110.17051/ ilkonline.2021.04.93

Darteh, E. (2021). *Factors for ensuring quality assurance of technical and vocational education (TVE) delivery in Ghana* [Doctoral dissertation, Kwame Nkrumah University]. Kwame Nkrumah University. https://ir.knust.edu.gh/ handle/123456789/14379

Espinoza, R., & Martinez, Y, N. (2023). *Quality matters: A comparative analysis of quality assurance mechanisms in adult education and training in OECD countries* (Working Paper No. 302). OECD. https://doi.org/10.1787/fc5ae97c-en

Gasmelseed, A. M. (2021). Quality assurance practices in public technical and vocational education and training institutions in the Khartoum State-Sudan. *Journal of Educational and Social Research, 11*(5), 21-31. https://doi.org/10.36941/jesr-2021-0102

Greere, A. (2023). Training for quality assurance in higher education: Practical insights for effective design and successful delivery. *Quality in Higher Education, 29*(2), 165-191. https://doi.org/10.1080/13538322.2021.2020 978

Handoyono, N. A. (2022). Comparative study of curriculum, learning models, and quality assurance in vocational education. *Journal for Education and Vocational Future, 1*(2), 1-8.

John, W. S., & Yusri, K. B. (2021). Realistic quality assurance for technical vocational education and training towards enhanced productivity: Literature review. *Ilkogretim Online, 20*(4), Article 858. https://doi.org/10.17051/ilkonline.2021.04.93

Khan, A., Egbue, O., Palkie, B., & Madden, J. (2017). Active learning: Engaging students to maximize learning in an online course. *Electronic Journal of E-learning, 15*(2), 107-115.

Kovalchuk, V., Maslich, S., Tkachenko, N., Shevchuk, S., & Shchypska, T. (2022). Vocational education in the context of modern problems and challenges. *Journal of Curriculum and Teaching*, *11*(8), 329-338.

Marjona, A. (2024). Education system and organization of education in the case of Uzbekistan and Finland. *European Journal of Learning on History and Social Sciences, 1*(1), 120-124. https://doi.org/10.47134/jtp.v1i3.258

Purnami, A. S., Mulyanto, M., & Utomo, S. (2021). Teaching factory, internal quality assurance system, and vocational teacher quality culture. *Journal of Education and Learning (EduLearn), 15*(3), 406-413. https://doi.org/10. 11591/edulearn.v15i3.18947

Qarni, W., Nasution, D. A., & Riinawati, R. (2022). Analysis system and procedure deletion goods owned by state center for the development of quality assurance of vocational education in building and electricity sector. *International Journal of Social Science, Education, Communication and Economics, 1*(1), 15-24. https://doi.org/10.54443/sj.v1i1.3

Rakhmankulovna, A. S. (2023). The system of educating the students in vocational education. *International Scientific and Current Research Conferences, 1*(1), 123–126.

Wafudu, S. J., Kamin, Y. B., & Marcel, D. (2022). Validity and reliability of a questionnaire developed to explore quality assurance components for teaching and learning in vocational and technical education. *Humanities and Social Sciences Communications, 9*(1), Article 303. http://dx.doi.org/10.1057/ s41599-022-01306-1

Pertanika Proceedings 1 (2): 97 - 100 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Exploring Business English Course Needs: Students' Views on Types and Difficulty Levels

Putu Ayu Prabawati Sudana[1]*, Ni Made Ratminingsih[2], Ni Nyoman Padmadewi[2] and Ni Luh Putu Sri Adnyani[1]

[1]Universitas Pendidikan Ganesha, English for Business and Professional Communication, Faculty of Languages and Arts, 81116, Buleleng, Bali, Indonesia
[2]Universitas Pendidikan Ganesha, English Language Education, Faculty of Languages and Arts, 81116, Buleleng, Bali, Indonesia

ABSTRACT

Business English is an important course designed to prepare students to engage in professional settings where English is needed. Tailoring the course materials to meet real-world demands is, therefore, essential. One of the ways is to conduct a needs analysis, the results of which will be the basis of the course syllabus and material development. This study explores Business English students' perceptions of the course needs, specifically the types and difficulty levels, in the context of North Bali. The study employed a mixed-methods design by disseminating a questionnaire to 132 respondents and conducting a semi-structured interview with 15 respondents. The findings indicated that the students perceived that all listed needs should be included in the materials. Regarding the degree of difficulty, students found tasks such as reading contracts/agreements, writing contacts/agreements and business emails, listening to social meetings and negotiations, speaking in face-to-face meetings and negotiations, and implementing etiquette in dining and social talks to be challenging. In addition, translating contracts/agreements was also perceived as a difficult task.

Keywords: Business English, needs analysis, North Bali students

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.017

E-mail addresses:
prabawati.sudana@undiksha.ac.id (Putu Ayu Prabawati Sudana)
made.ratminingsih@undiksha.ac.id (Ni Made Ratminingsih)
nym.padmadewi@undiksha.ac.id (Ni Nyoman Padmadewi)
sri.adnyani@undiksha.ac.id (Ni Luh Putu Sri Adnyani)
* Corresponding author

INTRODUCTION

Despite the crucial role of Business English courses in preparing Balinese students for workplace communication, several instructional issues persist. Observations and interviews at a State University in North Bali revealed that current learning materials do not align with industry needs. These materials, sourced mainly from books and

the internet, lack a needs analysis that considers learners' perspectives and do not adequately cover the four language skills or business manners. Consequently, students are unprepared for real workplace tasks, requiring additional time and training.

Addressing these issues is urgent, starting with a needs analysis involving Business English learners. Such analysis ensures that the curriculum is relevant and meets students' business communication needs, enhancing learning efficiency and motivation (Brown, 2016; Graves, 2000; Li, 2014; Nicol, 2021; Nychkalo et al., 2020). A task-based needs analysis will reflect real-life tasks students will encounter in the workplace (Long, 2005). Previous studies have identified necessary language skills for Business English but have not addressed task types, difficulty levels, or business etiquette (Farani & Yustisia, 2021; Lasekan et al., 2023). This research aims to fill that gap by examining North Bali students' perceptions of Business English task needs, including language skills, translating/interpreting, and business etiquette. As North Bali grows as a tourist destination, this analysis will inform updates to the course syllabus and materials, incorporating input from business professionals, lecturers, and department heads. The revised syllabus will sequence tasks better and allocate more time for challenging areas.

PROBLEM STATEMENT

Despite the critical importance of Business English courses in equipping students in Bali with the necessary skills for effective workplace communication, current instructional practices fall short of meeting industry needs. The learning materials used in these courses are primarily sourced from books and the internet without a comprehensive needs analysis that includes learners' perspectives. As a result, these materials lack exercises in the four essential language skills and omit crucial components such as business manners. Consequently, students are inadequately prepared for real-world tasks, necessitating additional time and training to meet workplace demands. This gap highlights the urgent need for a curriculum that is both relevant and aligned with the specific communication needs of students entering the business world.

RESEARCH QUESTION

How can a task-based needs analysis be utilized to develop Business English course materials that effectively address the language skill requirements and business etiquette needs of students in North Bali, ensuring their preparedness for real-world business communication tasks?

The study employs a mixed-method research design, combining quantitative and qualitative approaches. It used a survey with a questionnaire and semi-structured interviews. The questionnaire included 11 demographic questions and 47 items assessing the needs for Business English materials.

The study reveals students' perceived needs and challenges in Business English courses across various skills, including reading, writing, listening, speaking, translation, interpreting, and business etiquette. In reading, students identified tasks such as reading memos, proposals, reports, and business emails as necessary, emphasizing the need for exposure to authentic business texts and terminology (Smith et al., 2021). Writing tasks, including memos and reports, were also deemed important, with students highlighting the need to learn text formats and design aspects (Alhassan, 2021). Listening tasks, such as meetings and negotiations, require exposure to different accents and strategies to improve weak listening skills (Nichols & Straus, 2021). Speaking tasks, including meetings and presentations, were seen as crucial, with students noting the importance of non-verbal communication and confidence (Suban, 2021).

Translation and interpreting tasks were also necessary, particularly for business documents (Lyu, 2020). Business etiquette, including dining etiquette and handling complaints, was highlighted as essential for professional interactions (Guerrero-Dib et al., 2020). The study also assessed task difficulty, finding that tasks like writing contracts and emails and participating in meetings and negotiations were perceived as challenging due to unfamiliar legal terminology and lack of confidence.

CONCLUSION

This research examines North Bali students' perceptions of Business English task needs. The findings indicated that the students perceived that all listed needs should be included in the materials. In addition, several tasks are perceived as difficult for them. Further material development is encouraged using the results of this study as a basis. It is recommended that lecturers integrate real-life scenarios, authentic business texts, and interactive learning methods in their developed materials.

ACKNOWLEDGEMENT

The authors would like to express their appreciation to all the students who participated in this research. Their cooperation and insights were invaluable in completing this study.

REFERENCES

Alhassan, A. (2021). EFL postgraduate students' learning needs on English-medium business programmes: An exploratory study. *Language Teaching Research*, *25*(5), 798–816. https://doi.org/10.1177/1362168819857861

Brown, J. D. (2016). *Introducing Needs Analysis and English for Specific Purposes*. Routledge.

Farani, Y., & Yustisia, K. K. (2021). Developing speaking section of business English materials to teach culture in integrated way. *Journal of Applied Linguistics and Literature*, *6*(1), 162–176. https://doi.org/10.33369/joall.v6i1.11608

Graves, K. (2000). *Designing Language Courses: A Guide for Teacher*. Heinle & Heinle.

Guerrero-Dib, J. G., Portales, L., & Heredia-Escorza, Y. (2020). Impact of academic integrity on workplace ethical behaviour. *International Journal for Educational Integrity*, *16*(1), Article 2. https://doi.org/10.1007/s40979-020-0051-3

Lasekan, O. A., Moraga-Pumarino, A. F., & Pachava, V. (2023). Using needs analysis to foster sustainability of business English courses: A case study of a university in the South of Chile. *Sustainability (Switzerland)* , *15*(22), Article 16074. https://doi.org/10.3390/su152216074

Li, J. (2014). Needs analysis: An effective way in business english curriculum design. *Theory and Practice in Language Studies*, *4*(9), 1869-1874. https://doi.org/10.4304/tpls.4.9.1869-1874

Long, M. H. (2005). *Second Language Needs Analysis*. Cambridge University Press.

Lyu, J. (2020). The Modularized construction on translation competence for Business English majors in China. *English Language Teaching*, *13*(7), Article 124. https://doi.org/10.5539/elt.v13n7p124

Nichols, M. P., & Straus, M. B. (2021). *The Lost Art of Listening* (3rd ed.). Guilford Press.

Nicol, D. (2021). The power of internal feedback: Exploiting natural comparison processes. *Assessment and Evaluation in Higher Education*, *46*(5), 756–778. https://doi.org/10.1080/02602938.2020.1823314

Nychkalo, N., Wang, J., Lukianova, L., Paziura, N., & Muranova, N. (2020). Use of task-based approach in teaching vocabulary to Business English learners at university. *Advanced Education, 7*(16), 98–103. https://doi.org/10.20535/2410-8286.215117

Smith, R., Snow, P., Serry, T., & Hammond, L. (2021). The role of background knowledge in reading comprehension: A critical review. *Reading Psychology*, *42*(3), 214–240. https://doi.org/10.1080/02702711.2021.1888348

Suban, T. S. (2021). Teaching speaking: Activities to promote speaking skills in EFL classrooms. *Lectio: Journal of Language and Language Teaching*, *1*(1), 41–50.

Pertanika Proceedings 1 (2): 101 - 105 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

The Effectiveness of Virtual Reality Media Utilization on the Thematic Learning Through the Elementary Students Engagement

Vera Yuli Erviana, Ramadhani Uswatun Khasanah* and Nor Sania Aripah

Universitas Ahmad Dahlan, Elementary Teacher Education Department, Faculty of Teacher Training and Education, 55191, Yogyakarta, Indonesia

ABSTRACT

This research is motivated by the advancements in technology in the era of Industry 4.0, which have permeated almost all aspects of life, including the field of education. However, despite these advancements, there are some challenges in the education sector, including the lack of student engagement during learning activities. One of the contributing factors to this issue is the underutilization of technology-based media in the learning process. One of the latest and emerging media in this context is Virtual Reality. This research's objectives are (1) to investigate the implementation of the learning process using Virtual Reality media and (2) to assess the effectiveness of Virtual Reality media on the level of student engagement in Grade I during Theme 7, "Objects, Animals, and Plants Around Me" at SD Muhammadiyah Mertosanan. This study uses an experimental design with a quantitative approach, namely the Pre-Experimental Design with a One-Group Pretest-Posttest type. The research was conducted at SD Muhammadiyah Mertosanan from March 2023 to August 2023, involving a sample of 24 students of grade 1. The linearity test resulted in a significant value of 0.537, indicating that the variables in this study have a linear relationship. Based on the findings, it can be said that Grade I students at SD Muhammadiyah Mertosanan benefit from virtual reality media in terms of increased learning engagement. This implies that virtual reality media can serve as a reference for teachers to improve student engagement in learning.

Keywords: Student engagement, thematic learning, virtual reality media

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.018

E-mail addresses:
vera.erviana@pgsd.uad.ac.id (Vera Yuli Erviana)
ramadhani.khasanah@pgsd.uad.a.c.id (Ramadhani Uswatun Khasanah)
nor1900005355@webmail.uad.ac.id (Nor Sania Aripah)
* Corresponding author

INTRODUCTION

Education is an effort made by families, communities and the government by guiding, teaching and providing training obtained through learning at school and outside of school to prepare students who can become appropriate individuals in the living environment in the future (Zulkifli et al.,

2022). Basically, education is an interaction between educators and students, to achieve educational goals that take place in a certain environment (Partono, 2020). This interaction is known as educational interaction, namely the mutual influence between educators and students. One tool educators use to aid in interpreting or presenting material in learning activities is learning media (Magdalena et al, 2021). According to Novita et al. (2019), learning media can inspire students to complete their coursework and push themselves to meet their learning objectives. In addition, Tafonao (2018) notes that learning media encompasses all aspects of the physical and technical aspects of the educational process. Thematic learning is learning that combines various subjects by using specific themes. The relationship between one subject and other subjects for students is an important thing in learning, so that what students learn will be more meaningful, easier to remember and easier to understand, processed and used to solve problems in their lives (Djamaluddin & Wardana, 2019).

Based on observations carried out in August 2022 at Muhammadiyah Mertosanan Elementary School, the research discovered the problem that occurred was that the learning activities of class 1 students on animal science materials in the animal garden had not used interesting learning media and were still monotonous, so that students were less interested pay attention to the material presented and causes a lack of student participation in learning activities and it can be said that students are not active while the learning activities are taking place. Despite the fact that student learning activities are crucial to the learning process, they also help students develop their skills, think critically, and solve problems in their daily lives (Saidah, 2016).

Virtual Reality technology, also called VR, is the implementation of digital media that is displayed in real-time (real-world data) and follows environmental conditions that exist in the real world. It can be applied to mobile devices. Virtual reality is very helpful in depicting things that are difficult to present directly in the real world. The main advantage of virtual reality is the experience that makes users feel the sensation of the real world in the virtual world (Raditya et al., 2020).

Based on the explanation above, it is known that there is still a lack of enthusiasm for undertaking an activity at Mertosanan Muhammadiyah Elementary School. Moreover, there is still a lack of utilization of technology-based learning media in the learning process. The efforts are to utilize virtual reality media in the learning process, hoping that learning activity can increase.

METHODS

The type of research used in this study is quantitative research with an experimental method. The research design used in this study is Pre-Experimental Design (non-design). In this research design, the researcher only used one class, namely the first grade of Muhammadiyah Mertosanan Elementary School, for the 2023 academic year, with a total

of 24 students. The researchers conducted a pre-test before administering the treatment and then a post-test after the treatment.

RESULT

At the beginning of the meeting, the students were asked to complete a Pre-test consisting of 20 questions conducted before the lesson on Animals in the Zoo was given. After that, the researcher provided the students with a lesson on the topic of Animals in the Zoo with the help of Virtual Reality media. Subsequently, the students were given a Post-test consisting of 20 questions. The final stage of this research is to provide a questionnaire with six items regarding students' learning engagement.

Researchers found that the students were more enthusiastic about this learning activity than before. This was evident from the students eagerly sharing their experiences using virtual reality media, such as telling about the animals that they see, their characteristics, and their habits. In the closing section, the students appeared to actively participate in summarizing and reflecting on the learning activities that had been carried out.

Based on statistical descriptive data, pre-test results can be known to show that 24 respondents had a minimum learning score before being given treatment of 40 with a maximum score of 70. Then, an average of 62.21 with a standard deviation of 7,729. The Average value (median) is 60,00, and the value of frequent appearance (modus) is 55. Based on the descriptive post-test statistics, the achievement of 24 respondents had a minimum learning outcome score after treatment of 70, with a maximum score of 95. Then, an average of 82,08 was obtained, with a standard deviation of 6,580. The median value is 80,00, and the frequently appearing value (mode) is 75.

It is in line with research carried out by (Magdalena et al., 2021) that Virtual Reality media has been shown to increase the participation of students in learning activities, improve the spirit of learning, as well as help students to more easily understand the material being communicated. Similarly (Tsaaqib et al., 2022) also argues that the use of virtual reality media in learning activity makes students more interested and easier to understand the learning activity, so that use of this media is more effective than using conventional methods.

Based on the data above, the results of the pre-test and post-test values show significant differences. The average of the pre-test count is 60,21, while the average of the post-test count is 82,08. It indicates a fairly distant gap where the post-test score is higher than the pre-test. So, it can be concluded that virtual reality media is effective in improving the learning outcomes of pupils. The increased learning outcomes of the students will affect the student's learning activity towards the thematic learning process of Theme 7, namely about objects, animals and plants around me, on the animal identification material in the zoo at SD Muhammadiyah Mertosanan.

Learning activities are a system, in which there are a number of components that are interconnected with each other in order to achieve a goal. (Adiseil et al., 2022) believes that there are several components of learning that must be considered by an individual, namely learning objectives, learning sources, learning strategies, learning media and learning evaluation. Virtual Reality Media is a media capable of making its users feel a certain environment in the virtual world. Virtual Reality Media is a media capable of making its users feel a certain environment in the virtual world. (Supriadi, Hignasari, & Maheindradatta, 2019) argues that the use of Virtual Reality media and related technologies has grown in recent years as these media bring unacquired benefits to classical education. In line with this, (Shabir, 2022) argues that the use of virtual reality media in learning is considered more efficient because virtual reality can be done anywhere and at any time without theory of space and time as long as it is in the network and virtual reality medium can make the virtual world like the real world. (Robi'in et al., 2022) submits that the use of Virtual Reiality media allows learners to acquire cognitive skills through experiential learning, such as exposure to dangerous environments for real visits.

CONCLUSION

Learning activities using virtual reality media in class I at SD Muhammadiyah Mertosanan improved the students' engagement. The use of virtual reality media in learning activities impacts student engagement, which can be observed through the enthusiasm and participation of students during the learning process.

ACKNOWLEDGEMENT

The author would like to thank the headmaster of SD, Muhammadiyah Mertosanan, and all of the teachers and students.

REFERENCES

Adiseil, A., Aprilia, Z. U., Putra, R., & Prastiyo, T. (2022). Komponen-komponen pembelajaran dalam kurikulum 2013 pada mata pelajaran IPS [Learning components in the 2013 curriculum in social studies subjects]. *Journal of Education and Instruction (JOEAI), 5*(1), 298–304. https://doi.org/10.31539/joeai.v5i1.3646

Djamaluddin, A., & Wardana. (2019). *Belajar dan Pembelajaran* [Learning and Studying]. CV Kaaffah Learning Center.

Magdalena, I., Shodikoh, A. F., Pebrianti, A. R., Jannah, A. W., & Susilawati, I. (2021). Pentingnya media pembelajaran untuk meningkatkan minat belajar siswa SDN Meruya Selatan 06 pagi [The Importance of learning media to increase students' interest in learning at SDN Meruya Selatan]. *EDISI : Jurnal Edukasi Dan Sains, 3*(2), 312–325.

Novita, L., Sukmanasa, E., & Pratama, M. Y. (2019). Penggunaan media pembelajaran video terhadap hasil belajar siswa SD [The use of video learning media on learning outcomes of elementary school students]. *Indonesian Journal of Primary Education, 3*(2), 64–72. https://doi.org/10.17509/ijpei.v3i2.22103

Partono. (2020). Efektivitas metode circuit learning dalam meningkatkan keaktifan belajar siswa dalam mata pelajaran Qur'an Hadist [The effectiveness of the circuit learning method in increasing student learning activeness in the subject of Qur'an Hadith]. *Al-Ishlah Jurnal Pendidikan Islam, 18*(1), 133–146. https://doi.org/10.35905/alishlah.v18i1.1166

Raditya, I. W. A., Darmawiguna, G. M., & Sindu, I. G. P. (2020). Pengembangan virtual reality untuk digitalisasi pura penataran agung di Pura Besakih [Development of virtual reality to digitalize the Penataran Agung Temple at Pura Besakih]. *INSERT : Informatiion System and Emerging Technology Journal, 1*(1), 12-24. https://doi.org/10.23887/insirt.v1i1.25872.

Robi'in, B., Erviana, V. Y., & Sulisworo, D. (2022). Outreach program, virtual reality, dan berpikir hipotetikal deduktif [Outreach program, virtual reality, deductive thinking, science and technology talk]. *Bincang Sains Dan Teknologi, 1*(1), 18–25. https://doi.org/10.56741/bst.v1i01.46

Saidah, E. M. (2016). Peran psikologi pendidikan dalam pembelajaran PAI [The role of educational psychologt in PAI learning]. *Al-Ishlah: Jurnal Pendidikan, 8*(2), 310–329. https://doi.org/10.35445/alishlah.v8i2.25

Shabir, A. (2022). Uji coba penggunaan teknologi virtual reality sebagai media pembelajaran [The trial use of virtual reality technology as learning media]. *Jurnal Pendidikan Tambusai, 6*(1), 696–702.

Supriadi, M., Hignasari, L. V., & Mahendradatta, U. (2019). Pengembangan media pembelajaran berbasis virtual reality [Development of virtual reality-based learning media]. *KOMIK (Konferensi Nasional Teknologi Informasi Dan Komputer*, *3*(1), 578–581. https://doi.org/10.30865/komik.v3i1.1662

Tafonao, T. (2018). Peranan media pembelajaran dalam meningkatkan minat belajar mahasiswa [The role of learning media in increasing student interest in learning]. *Jurnal Komunikasi Pendidikan, 2*(2), 103-114. https://doi.org/10.32585/jkp.v2i2.113

Tsaaqib, A., Buchori, A., & Endahwuri, D. (2022). Efektivitas penggunaan media pembelajaran virtual reality (VR) pada materi trigonometri terhadap motivasi dan hasil belajar matematika siswa SMA. *Jurnal Ilmiah Pendidikan Matematika, 7*(1), 11–19. https://doi.org/10.26877/jipmat.v7i1.995

Zulkifli, Z., Kristiawan, M., & Sasongko, R. N. (2022). Improving students' active learning through demonstration method. *AL-ISHLAH: Jurnal Pendidikan*, *14*(4), 6539-6550. https://doi.org/10.35445/alishlah.v14i4.2313

Pertanika Proceedings 1 (2): 107 - 110 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Development of Vlog-based Learning Media in Class Xi History Subjects Colonialism and Imperialism Materials at Dharmawangsa High School, Medan

Ricu Sidiq*, Najuah Najuah, Samsidar Tanjung and Indri Telaumbanua

Department of History Education, Faculty of Social Sciences, Medan State University, Medan 20221, Indonesia

ABSTRACT

This study aims to determine how the process of developing vlog-based media improves student learning outcomes, the feasibility of vlog-based learning media at the student learning level, and the product's effectiveness on student learning outcomes. This study uses the Borg & Gall research method, which includes potential problems, data collection, product design, design validity, design revision, product trial, product revision, usage trial, and product revision. In the validation of media experts, it is known that vlog-based learning media scores 86.9% in the very valid category. The material expert scores 88.5% in the very valid category. The results of the pretest are 65, and the posttest is 85. This vlog-based learning media is appropriate for learning history with colonialism and imperialism materials.

Keywords: Development, history learning media, vlog

INTRODUCTION

Learning activities involve communication between educators and students, where teachers provide information and students listen and engage. Students' success in understanding learning depends significantly on this interaction. Educators play a crucial role in making learning enjoyable, and integrating technology into learning media can enhance student motivation (Inah, 2015; Lazar, 2015; Mfreke & Bassey, 2020; Qureshi et al., 2021; Yusuf et al., 2023). Traditionally, teachers were seen as the sole source of information, but technological advancements now allow students to access learning materials independently. If outdated teaching methods persist, students may become bored, hindering learning (Adawiyah, 2021; Henrie

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.019

E-mail addresses:
ricusidiq@unimed.ac.id (Ricu Sidiq)
najuah@unimed.ac.id (Najuah Najuah)
samsidar@unimed.ac.id (Samsidar Tanjung)
indritelaumbanua@unimed.ac.id (Indri Telaumbanua)
* Corresponding author

et al., 2015; Nafiah et al., 2021; Santana-Monagas & Núñez, 2024; Susanti et al., 2024; Trisnawati & Fauziya, 2024).

Observations at SMA Dharmawangsa Medan revealed that history lessons still rely on conventional methods, with teachers lecturing and students passively listening. This approach, coupled with minimal media use and reliance on textbooks, leads to student disinterest and confusion due to varying textbook content. A questionnaire indicated that students often feel bored during history lessons and fail to meet minimum standards. To address this, researchers propose using vlog-based media, incorporating flexible and visual videos to engage students. Enhanced with animation, Vlogs can capture students' attention, boost knowledge, imagination, and critical thinking, and encourage active participation in the learning process (Herawati et al., 2021; Pancawardhani et al., 2022; Susanti, 2019).

PROBLEM STATEMENT

The traditional teaching methods employed in history classes at SMA Dharmawangsa Medan, which primarily involve teacher-centered lectures and minimal use of engaging media, have led to student disinterest and underperformance. Despite the availability of technology to enhance learning experiences, the current approach fails to motivate students or facilitate an effective understanding of historical content. This situation necessitates exploring innovative teaching methods that leverage technology to improve student engagement and learning outcomes.

RESEARCH QUESTION

How can vlog-based media be effectively integrated into history lessons to enhance student engagement and improve learning outcomes at SMA Dharmawangsa Medan?

The study employs a research and development method to create or improve a product, focusing on its impact on student learning outcomes. This method involves analyzing both the feasibility and effectiveness of the product. The research follows the Borg & Gall development model, which includes ten stages: identifying potential and problems, data collection, product design, design validation, design revision, product testing, further product revision, usage trials, and final product revision.

The research conducted at SMA Dharmawangsa Medan aimed to develop vlog-based media to teach the topics of colonialism and imperialism in North Sumatra. Initially, observations and interviews highlighted potential and challenges. While the school had facilities like LCD projectors and motorized screens to support vlog-based learning, some classes lacked functioning projectors, forcing teachers to rely on traditional print media. Researchers collected information from various books and journals to inform the content. During the product design phase, storyboards were created to guide the development of videos featuring scenes from the North Sumatra Museum.

Before testing with students, the videos underwent validation by material and media experts to identify and correct any deficiencies. Following expert feedback, necessary revisions were made. A small group trial involving six students from class XI IPS indicated that the media was "Very Appropriate," achieving a feasibility percentage of 89.12% with an average score of 84.6. Further revisions were made based on student feedback, particularly in adjusting the layout of text and images.

Subsequently, a larger trial with 29 students from class XI Science confirmed the media's effectiveness, with a feasibility percentage of 85.4% and an average score of 81.1. After thorough testing for feasibility and effectiveness, the final product was deemed suitable and effective for enhancing the history learning process.

The results obtained from vlog-based learning media on colonialism and imperialism in North Sumatra in terms of student learning outcomes before and after using learning media increased from 65 to 85.

CONCLUSION

Research and development of vlog-based learning media has been conducted on history subjects for class XI about colonialism and imperialism in North Sumatra. It can be concluded that this study uses a development research method. This method aims to develop a product and to answer existing problems. The achievement of media effectiveness obtained from the results of the pretest and posttest of 20 questions can be proven with a total result of 83.6%, which means that the teaching materials developed are valid or suitable for use without revision. So, it can be obtained that vlog-based history learning media on the material about colonialism and imperialism in North Sumatra is very suitable for use in the teaching and learning process in the classroom.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to all those who contributed to the successful completion of this research. They also thank the faculty and staff at SMA Dharmawangsa Medan for their support and cooperation during this study. The authors are also grateful to the students who participated in the trials, providing valuable feedback for refining the learning media. Lastly, they extend their appreciation to the experts who validated the materials and offered insightful suggestions, ensuring the quality and effectiveness of the final product.

REFERENCES

Adawiyah, F. (2021). Variations in teacher teaching methods to overcome student boredom in junior high school. *Jurnal Pendidikan Pancasila Dan Kewarganegaraan, 2*(1), 68-82.

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. *Computers and Education, 90*, 36–53. https://doi.org/10.1016/j.compedu.2015.09.005

Herawati, Lagiono, & Saufi, M. (2021). The implementation of video vlog learning at SDN Ulu Benteng 2 Marabahan. *Prosiding Seminar Nasional Bahasa, Sastra, Seni, dan Pendidikan Dasar (SENSASEDA), 1*, 71–79.

Inah, E. N. (2015). The Role of Communication in Teacher-Student Interaction. Jurnal Al-Ta'dib, 8(1), 150–167.

Lazar, S. (2015). The importance of educational technology in teaching. *International Journal of Cognitive Research in Science, Engineering and Education*, *3*(1), 111-114.

Mfreke, U. D., & Bassey, M. (2020). Teaching and learning with media technology. *Novateur Publications International Journal of Innovations in Engineering Research and Technology, 7*(5), 2394–3696.

Nafiah, M., Lestari, I., & Zahra, A. (2021). An analysis of student boredom in learning during the covid-19 pandemic in elementary schools in Jakarta, Indonesia. PARAMETER: *Jurnal Pendidikan Universitas Negeri Jakarta, 33*(2), 130–146. https://doi.org/10.21009/parameter.332.03

Pancawardhani, H., Sumarni, W., & Prasetyo, A. T. (2022). Utilization of learning media based on blogs, videos, and vlogs that have a positive impact on learning. *Unnes Science Education Journal Accredited Sinta, 11*(3), 137–144. https://doi.org/10.15294/usej.v11i3.60688

Qureshi, M. I., Khan, N., Raza, H., Imran, A., & Ismail, F. (2021). Digital technologies in education 4.0: Does it enhance the effectiveness of learning? *International Journal of Interactive Mobile Technologies, 15*(4), 31–47. https://doi.org/10.3991/IJIM.V15I04.20291

Santana-Monagas, E., & Núñez, J. L. (2024). Boredom in the classroom: Sentiment analysis on teaching practices and outcomes. *Education Inquiry,* 1-20. https://doi.org/10.1080/20004508.2024.2406605

Susanti, E. D. (2019). Project-based learning: Utilizing Vlogs in history education for the gadget generation. *Jurnal Sejarah, Budaya Dan Pengajarannya, 13*(1), 85–96. https://doi.org/10.17977/um020v13i12019p84

Susanti, S., Aminah, F., Mumtazah Assa'idah, I., Aulia, M. W., & Angelika, T. (2024). Negative impact of monotonous teaching methods on student motivation. *Pedagogik Jurnal Pendidikan dan Riset, 2*(2), 86–93.

Trisnawati, T., & Fauziya, D. S. (2024). Factors contributing to student boredom in grade VIII Indonesian language learning. *Aliansi: Jurnal Hukum, Pendidikan Dan Sosial Humaniora, 1*(5), 214–226. https://doi.org/10.62383/aliansi.v1i5.407

Yusuf, O. Y. H, Sandy, N., Sarpan, L., & Selfia, A. (2023). Educator and learner interaction in creating a positive relationship in the classroom. *JETISH: Journal of Education Technology Information Social Sciences and Health, 2*(1), 66-71.

Pertanika Proceedings 1 (2): 111 - 115 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Stakeholder Perspectives Regarding Drug Addiction Counseling: A Multicultural Study

Rosmala Dewi[1]*, Sri Milfayetty[1], Muhammad Bukhori Dalimunthe[2], Nindya Ayu Pristanti[1] and Utami Nurhafsari Putri[1]

[1]Guidance and Counseling Department, Faculty of Education, Universitas Negeri Medan, 20221, Medan, Indonesia

[2]Economics Department, Faculty of Economics, Universitas Negeri Medan, 20221, Medan, Indonesia

ABSTRACT

This study explores the perspectives of Lecturer-Teacher-Student stakeholders regarding drug addiction counseling based on multiculturalism (Gender-G and Ethnicity-E) attached to stakeholders. Data collection used a questionnaire adopted from scholars interested in addiction counseling. Next, the data obtained was arranged based on the predicate Good, Fair, and Less at their perspective levels. This research involved 159 respondents, including lecturers (n=17), guidance and counseling teachers (n=28), and students (n=114). Data analysis uses descriptive statistics that highlight multicultural aspects of gender and ethnicity. Findings from the lecturer's perspective majorly show that drug addiction counseling in the multicultural aspect has a Good predicate (G=71%; E=71%), while the rest have a Fair predicate (G=29%; E=29%), respectively. Furthermore, from the teacher's perspective, drug addiction counseling in the multicultural aspect has a Good predicate (G=68%; E=68%), while the rest have a Fair predicate (G=32%; E=32%), respectively. Finally, from the students' perspective, addiction counseling in the multicultural aspect is dominated by the Fair predicate (G=62%; E=62%), while the rest have the Good predicate (G=38%; E=38%), respectively. These findings show that lecturers and teachers have a significant perspective on drug addiction counseling based on multicultural aspects, which is in the Good predicate, while students are in the Fair predicate. Implication: Students require stakeholder engagement to strengthen their knowledge regarding drug addiction counseling.

Keywords: Addiction counseling, gender, ethnicity, lecturer-teacher-student perspective

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.020

E-mail addresses:
ros_dw@unimed.ac.id (Rosmala Dewi)
milfayetty@unimed.ac.id (Sri Milfayetty)
daliori86@unimed.ac.id (Muhammad Bukhori Dalimunthe)
nindyapristanti@unimed.ac.id (Nindya Ayu Pristanti)
utami.dongoran@unimed.ac.id (Utami Nurhafsari Putri)
* Corresponding author

e-ISSN: 3083-9475

INTRODUCTION

Teenagers play a crucial role in a nation's development, but their behavior, particularly drug exposure, is concerning (Kadir et al., 2024). It's our collective responsibility to monitor and support them (Pirdaus et al., 2024). Drug abuse is a significant global issue, affecting the younger generation and hindering national development (Tummala et al., 2024). It is a behavioral issue influenced by various factors, and insufficient communication about its dangers can lead to increased curiosity and drug use in adolescents (Kristianto & Chairani, 2024). Drug abuse in Indonesia is prevalent, with high levels of Class I, II, III, and IV psychotropics being used, including MDMA, amphetamines, methamphetamines, and sedatives.

Indonesia faces a drug emergency with 5. 1 million users and 15,000 annual deaths. Most users are 24–30, requiring collective action to protect the youth. Monitoring and guiding teenagers is essential (Oktriyanto et al., 2020). The growing population poses moral challenges. Early awareness and participation in social and religious activities are crucial to prevent drug spread. Adolescents may experiment with drugs, making the issue a serious concern (Hechanova et al., 2023). The Narcotics Law 2021 outlines penalties for drug users and dealers, emphasizing only healthcare and scientific use (Marbun & Ismed, 2023). Institutions and the community play a crucial role in addressing the drug crisis, providing training and positive activities to combat drug abuse. The goal is maintaining family harmony and encouraging recreational activities (Hechanova et al., 2023).

This paper explores the influence of cultural factors on stakeholders' perspectives in developing culturally competent and inclusive addiction counseling programs.

PROBLEM STATEMENT

This study examines the challenges primary education teachers face in the Indonesia-Malaysia border region in developing mathematical literacy skills, highlighting the importance of early education in addressing modern demands.

RESEARCH QUESTIONS

How do prospective primary education teachers perceive their knowledge of mathematical literacy skills while teaching basic mathematical concepts in the border area? Addiction counseling provides advice and practical suggestions to individuals struggling with toxic substance dependence, aiming to address the challenges and potential death associated with excessive use (Rani & Hemavathy, 2022). Interpersonal communication theory in addiction counseling promotes empathy, trust, cooperation, creativity, and informed decision-making through active listening, eye contact, self-disclosure, and motivation (Choi et al., 2024). Maintaining eye contact is crucial for accurate information and building relationships while

avoiding it indicates a desire to limit interaction. Counselors focus on eliciting motivation (Kim, 2011). Multiculturalism promotes cultural diversity and equality, addressing politics, justice, employment, human rights, and ethical principles by understanding and respecting one's culture and others. Meanwhile, Mansouri and Modood (2021) emphasize that multiculturalism fosters knowledge exchange, innovation, and inclusivity within communities, while a multicultural counselor upholds cultural diversity, values clients' beliefs, and comprehends counseling rules (Steward et al., 1998).

A Multicultural counselor is aware of their personal and clients' diverse values, utilizing general counseling characteristics to effectively conduct counseling (Malott et al., 2023). Counselors in education must consider cultural differences, respect the environment, and adhere to counseling codes of ethics, avoiding imposing personal values on clients (Shahabnia et al., 2020). Cross-cultural counselors should use an eclectic approach, focusing on cultural awareness and education, to effectively address client problems, overcome communication barriers, and understand multicultural studies' impact on social communities (Audretsch et al., 2021). Counselors should adopt a comprehensive multicultural counseling approach, focusing on self-awareness, cultural sensitivity, sensitivity to sexism, poverty, individual differences, and effective techniques (Bulmer et al., 2022).

Counselors must understand cultural diversity, acculturation, and their own culture to effectively work with clients, fostering open communication and promoting acculturation in multicultural environments like Indonesia (Malott et al., 2023). Counselors must be multiculturally aware, appreciate client diversity, recognize biases, and develop culturally appropriate strategies, as outlined in the drug multicultural counseling model (Ridley et al., 2021). The study surveyed Universitas Negeri Medan's guidance and counseling program, focusing on multiculturalism and drug addiction counseling among students, teachers, and lecturers using questionnaires and interviews (Tables 1 and 2).

The study reveals that female students and teachers, predominantly Batak, exhibit better understanding and empathy towards drug-related issues, highlighting the need for multicultural training programs.

Table 1
Distribution of respondents

Stakeholder	Gender		N	Ethnic/Culture						
	Male	Female		Batak	Jawa	Melayu	Aceh	Minang	Nias	Others
Students	14	100	114	70	28	5	4	2	1	4
Teachers	7	21	28	16	10	0	0	1	0	1
Lecturers	5	12	17	6	5	3	1	1	0	1

Table 2
Analysis understanding of addiction

Group	Gender	Under/Basic Understanding (%)	Advanced Understanding (%)	Understanding with High Empathy (%)
Students	Male	0	7,018	5,263
	Female	0	55,263	32,456
Teachers	Male	0	10,714	14,286
	Female	0	21,429	53,571
Lecturers	Male	0	17,647	11,765
	Female	0	11,765	58,824

CONCLUSION

Integrating multicultural counseling into education enhances drug addiction counseling effectiveness. Future research should explore the long-term impact and cultural factors influencing counseling and develop tailored strategies for multicultural settings.

ACKNOWLEDGEMENT

We express our gratitude to Research and Community Service Institutions Universitas Negeri Medan for awarding a grant in our 2024 applied research scheme and to students, lecturers, teachers, and schools for their contributions.

REFERENCES

Audretsch, D. B., Belitski, M., & Korosteleva, J. (2021). Cultural diversity and knowledge in explaining entrepreneurship in European cities. *Small Business Economics, 56*(2), 593-611. https://doi.org/10.1007/s11187-019-00191-4

Bulmer, L., Stanley, C., Loffredo, L., Mills, R., & Doyle, L. (2022). Building a foundation in self-awareness: Genetic counseling students' experiences with self-care, reflection, and mindfulness. *Journal of Genetic Counseling, 31*(3), 722-734. https://doi.org/10.1002/jgc4.1539

Choi, D. S., Park, J., Loeser, M., & Seo, K. (2024). Improving counseling effectiveness with virtual counselors through nonverbal compassion involving eye contact, facial mimicry, and head-nodding. *Scientific Reports, 14*(1), Article 506. https://doi.org/10.1038/s41598-023-51115-y

Hechanova, M. R. M., Teng-Calleja, M., Canoy, N. A., & de Guzman, J. M. (2023). Community-based drug rehabilitation and care in philippine local governments. *International Perspectives in Psychology, 12*(1), Article a000058. https://doi.org/10.1027/2157-3891/a000058

Kadir, S. A., Doni, C., Rasyid, M. T., Astuti, N. K., Arif, N., & Ashar, A. N. P. C. (2024). The influence of drug abuse on the young generation. *Formosa Journal of Applied Sciences, 3*(2), 623-632. https://doi.org/10.55927/fjas.v3i2.7783

Kim, B. S. K. (2011). Client motivation and multicultural counseling. *The Counseling Psychologist*, *39*(2), 267-275. https://doi.org/10.1177/0011000010375310

Kristianto, J., & Chairani, R. (2024). Healthy village development program (PPDS) halfway house health reform agent for Marginalized Groups in Jakarta. *Asian Journal of Engineering, Social and Health*, *3*(1), 64-75. https://doi.org/10.46799/ajesh.v3i1.209

Malott, K. M., Yee, T., & Barraclough, S. (2023). Overcoming barriers to social justice learning in multicultural counselor education. *International Journal for the Advancement of Counselling*, *45*(2), 356-369. https://doi.org/10.1007/s10447-023-09506-3

Mansouri, F., & Modood, T. (2021). The complementarity of multiculturalism and interculturalism: Theory backed by Australian evidence. *Ethnic and Racial Studies*, *44*(16), 1-20. https://doi.org/10.1080/01419870.2020.1713391

Marbun, L. P. E., & Ismed, M. (2023). How to enforce criminal law against narcotics abuse of new types of variants that have not been included in law number 35 of 2009 concerning narcotics. *Policy, Law, Notary and Regulatory Issues (Polri), 2*(1), 67-80. https://doi.org/10.55047/polri.v2i1.531

Oktriyanto, O., Amrullah, H., & Titisari, A. S. (2020). Family function and misuse of drug in adolescents in Indonesia. *Jurnal Kesehatan Masyarakat, 16*(2), 271-283. https://doi.org/10.15294/kemas.v16i2.23304

Pirdaus, D. I., Ibrahim, R. A., & Yuningsih, S. H. (2024). Tramadol abuse among adolescents: Analysis based on differential association theory in Tasikalaya Regency. *International Journal of Health, Medicine, and Sports, 2*(1), 26-30. https://doi.org/10.46336/ijhms.v2i1.75

Rani, R. A. N., & Hemavathy, V. (2022). Counselling to promote self-esteem-Pilot analysis. *Cardiometry, 22,* 429-434. https://doi.org/10.18137/cardiometry.2022.22.429434

Ridley, C. R., Mollen, D., Console, K., & Yin, C. (2021). Multicultural counseling competence: A construct in search of operationalization. *Counseling Psychologist, 49*(4), 504-533. https://doi.org/10.1177/0011000020988110

Shahabnia, S., Lotfi, R., Rahimzadeh, M., Yazdkhasti, M., & Tourzani, Z. M. (2020). Effects of counseling professional ethics principles on midwifery professional codes of ethics compliance and applicability rate among midwives in community health centers: A randomized clinical trial in Iran. *Pan African Medical Journal, 35*(1), Article 139. https://doi.org/10.11604/pamj.2020.35.139.20702

Steward, R. J., Wright, D. J., Jackson, J. D., & Jo, H. I. (1998). The relationship between multicultural counseling training and the evaluation of culturally sensitive and culturally insensitive counselors. *Journal of Multicultural Counseling and Development, 26*(3), 205-217. https://doi.org/10.1002/j.2161-1912.1998.tb00199.x

Tummala, H. P., Bies, R. R., & Ramanathan, M. (2024). Modelling the progression of illicit substance use patterns from real-world evidence. *British Journal of Clinical Pharmacology, 90*(3), 700-712. https://doi.org/10.1111/bcp.15965

Pertanika Proceedings 1 (2): 117 - 120 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Students' Perceptions of Using Google Docs in Collaborative English Writing

Sakina Simal* and Yuyun Yulia

Master of English Education Department, Faculty of Language, Arts, and Culture, Yogyakarta State University, Special Region of Yogyakarta 55281, Indonesia

ABSTRACT

This study explores how students perceive the use of Google Docs, their challenges, and their specific impact on their writing skills. 44 EFL students are participating. The data was obtained through surveys and interviews, which provided insights into students' experiences. Data was analyzed using thematic and percentage analysis. The result revealed that Google Docs is primarily used for group assignments, promoting real-time collaboration and allowing immediate feedback. Students reported improved writing skills, including better organization, primary usage, and increased grammatical accuracy. However, technical problems such as limited formatting options and unstable internet connection posed significant barriers. Addressing these issues through better technical support and training could optimize using Google Docs. This research suggests Google Docs has strong potential to support collaborative learning and enhance digital literacy in EFL contexts, making it a valuable tool in educational technology.

Keywords: Collaborative writing, Google Docs, student's perception

INTRODUCTION

Information and communication technologies (ICT) have become vital in education, particularly English language teaching, by offering innovative solutions to traditional challenges. One significant development is online collaborative tools that allow students to discuss, critique, and share knowledge (Gao et al., 2009). Google Docs, a cloud-based platform accessible from various devices, supports collaboration through features like synchronous and asynchronous editing (Mohammed & Al-Jaberi, 2021), commenting and autocorrect tools (spelling, punctuation, and grammar), and writing assistance (Zainal & Fan, 2024). While these tools enhance collaborative writing,

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.021

E-mail addresses:
sakinahsimal@gmail.com (Sakina Simal)
yuyunyulia@uny.ac.id (Yuyun Yulia)
* Corresponding author

challenges like unstable internet and synchronization issues require technical support and training.

Previous studies have shown that Google Docs promotes peer interaction, critical thinking, and self-confidence (Alharbi, 2019). However, research focusing on the experiences of Indonesian EFL students using Google Docs for collaborative English writing remains limited. This study fills this gap using a mixed-method design involving 44 EFL students from Indonesian universities, with data collected through surveys and semi-structured interviews. Surveys provided quantitative data, while interviews added depth and validated findings. Before using the instruments, the researcher conducted pilot testing to validate the instruments used.

The quantitative data was analyzed using percentage analysis and interviews through thematic analysis to identify key themes. Data integration highlighted patterns and differences, offering comprehensive insights. Clear instructions and a user-friendly survey platform addressed response bias and technical issues. Triangulation ensured the accuracy and reliability of results.

This research offers a fresh contribution by exploring the benefits of Google Docs and addressing practical challenges faced by students. It offers a localized perspective on ICT use in Indonesian EFL contexts.

PROBLEM STATEMENT

This study examines students' perceptions of using Google Docs in collaborative writing in English. Understanding students' perceptions can provide insights into future educational practices and guide improvements in digital tools to better support collaborative learning. By addressing the limitations faced by students, such as technical issues and learning curve challenges, educators and policymakers can optimize the use of Google Docs and similar technologies in the classroom environment.

RESEARCH QUESTIONS

Students' Collaborative Writing Activities Using Google Docs

Based on data, 84.4% of respondents indicated that students use Google Docs primarily for group assignments. The platform supports teamwork in an academic setting, allowing students to work together in real time, share ideas, and provide feedback. Google Docs is used more often for structured group assignments than individual activities, indicating that its collaborative features are highly valued. In addition, using Google Docs supports interactions between students and between students and lecturers, which aligns with the theory of social constructivism (Vygotsky, 1978). It shows how technology acts as a mediator in interactions, increasing student engagement in collaborative writing projects.

Experiences Technical Problems

Based on the data, the most common obstacle was an unstable internet connection, reported by 51.1% of respondents. This issue disrupted access to documents and hindered real-time collaboration. In addition, students also experienced difficulties in managing document access and confusion with more complex formatting options. The participant stated, "the features in Google Docs are still a bit confusing, especially when editing the writing format." These shortcomings indicate better user support and more adequate instructional design.

The Impact of Google Docs on Writing

Google Docs positively impacts students' writing skills, particularly in improving organization and collaboration. The data shows that 55.6% of respondents reported moderate improvement in their writing skills, with 22.2% strongly agreeing and 55.6% agreeing that their English writing skills have improved. Additionally, 33.3% strongly agreed, and 40% agreed that Google Docs helped them organize their ideas more effectively. The tool also facilitated collaboration on writing assignments, with 60% strongly agreeing and 40% agreeing that the tool made teamwork easier. Additionally, 26.7% strongly agreed, and 60% agreed that Google Docs effectively obtained feedback.

Google Docs' integration with tools such as Grammarly and Google Classroom creates a comprehensive environment for developing writing skills. Participants noted that the Grammarly integration improved the quality of writing, while the cloud storage ensured accessibility across devices.

CONCLUSION

This study demonstrates that Google Docs in collaborative English writing positively impacts students, particularly in group assignments and joint academic activities, with most respondents reporting improved writing skills. Its real-time collaboration, commenting features, and live revisions foster an interactive learning environment. However, challenges like unstable internet connections and limited text formatting exist compared to other applications like Microsoft Word. To enhance its functionality, developers must strengthen the offline mode and introduce advanced formatting tools. Despite these technical issues, Google Docs remains an effective tool for improving students' writing skills, facilitating timely feedback from lecturers, supporting academic collaboration, and fostering the development of 21st-century skills.

ACKNOWLEDGEMENT

The researcher expresses gratitude to the participants who contributed to this study.

REFERENCES

Alharbi, M. A. (2019). Exploring the potential of Google Doc in facilitating innovative teaching and learning practices in an EFL writing course. *Innovation in Language Learning and Teaching, 14*(3), 227-242. https://doi.org/10.1080/17501229.2019.1572157

Gao, F., Wang, C., & Sun, Y. (2009). A new model of productive online discussion and its implication for research and discussion. *Journal of Educational Technology Development and Exchange*, *2*(1), 65-78. https://doi.org/10.18785/jetde.0201.05

Mohammed, M. A. S., & Al-Jaberi, M. A. (2021) Google Docs or Microsoft Word? Master's students' engagement instruction written feedback on academic writing in a cross-cultural setting. *Computers and Composition, 62*, Article 102672. https://doi.org/10.1016/j.compcom.2021.102672

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

Zainal, A. Z., & Fan, M. F. (2022). ESL learners' processes and perceptions of using Google Docs in collaborative academic writing. *International Journal of Computer-Assisted Language Learning and Teaching, 12*(4), 1-12. https://doi.org/10.4018/IJCALLT.310077

Pertanika Proceedings 1 (2): 121 - 124 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Effectiveness of Using Mobile Applications in Science Learning at MAN 2 Probolinggo Post-pandemic

Siti Asiah[1]*, Mustaji[2], Utari Dewi[2], Rohim[3] and Mujianto Solichin[4]

[1]*Post Doctoral Student Surabaya State University, Faculty of Science Education/ Darul Ulum Islamic Boarding School University, Faculty of Islamic Religion, 61481, East Java, Indonesia*
[2]*Surabaya State University, Faculty of Science Education, 60231, East Java, Indonesia*
[3]*College of Development Administration Sciences, Public Administration Study Program, 68135, East Java, Indonesia*
[4]*Darul Ulum Islamic Boarding School University, Faculty of Islamic Religion, 61481, East Java, Indonesia*

ABSTRACT

This study aims to evaluate the effectiveness of using mobile applications in Natural Science (IPA) learning at MAN 2 Probolinggo after the COVID-19 pandemic. This study uses a quantitative descriptive method involving MAN 2 Probolinggo students as respondents. Data were collected through questionnaires filled out by students and interviews with teachers to gain qualitative insights. The results showed that the use of mobile applications significantly improved students' learning achievement in science subjects compared to conventional methods. The average score of the experimental group's learning achievement test was higher than the control group. In addition, the results of the questionnaire showed that students felt more motivated and interested in the learning process using mobile applications. Interviews with teachers also revealed that mobile applications facilitated the delivery of materials and increased interaction between students and teachers. However, challenges such as limited devices and internet connectivity are still obstacles that need to be overcome. This study concludes that using mobile applications in science learning at MAN 2 Probolinggo post-pandemic has a high effectiveness and positive impact on student learning achievement and motivation. Recommendations are given for integrating mobile applications in the learning curriculum as one of the modern learning strategies adaptive to technological developments. Further research is recommended to explore the use of mobile applications in various subjects and educational contexts.

Keywords: Effectiveness, learning achievement, mobile application, motivation, science learning

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.022

E-mail addresses:
sitiasiah@fai.unipdu.ac.id (Siti Asiah)
Mustaji@unesa.ac.id (Mustaji)
utaridewi@unesa.ac.id (Utari Dewi)
rohim.annida86@gmail.com (Rohim)
mujiantosolichin@fai.unipdu.ac.id (Mujianto Solichin)
* Corresponding author

e-ISSN: 3083-9475

INTRODUCTION

Technological progress has not only penetrated various countries but also various sectors, one of which is the education sector. For the education sector, technology is a vital component in supporting teaching and learning activities. Learning media is a tool teachers use to convey knowledge to students, which increases students' interest in the subject matter. This is in line with what several experts have stated regarding learning media. Heinich, (1996) stated that media is a tool that can carry information for learning purposes. Learning media acts as a means of communication between educators and students, which allows the information conveyed by educators to be well-received by students (Nurfadhillah et al., 2021; Saputra & Isnain, 2021).

Since the COVID-19 pandemic hit Indonesia in early 2020, the government implemented Large-Scale Social Restrictions (PSBB), which required the community, including teachers and students, to carry out activities from home. Teachers are required to master digital media and be able to create effective and innovative digital-based learning media. Mobile learning allows students to access learning materials through applications anywhere and anytime (Bambang, 2008).

Online learning media can improve teaching and learning (Azhiimah et al., 2021). In addition, online media makes students more active in participating, supports students in accessing knowledge (Karyanto et al., 2020), improves student learning outcomes during the pandemic (Tampubolon et al., 2021), plays a role in supporting students' learning interests (Awalia et al., 2021). Van et al. (2021) highlighted the effectiveness of technology in enhancing English language learning. However, using this technology also faces challenges, as stated by Sumilat (2022), especially regarding limited internet access and digital skills of students and teachers, which are still obstacles to its implementation. With the increasing need for distance learning, applications such as Smart App Creator become essential. This application allows the creation of various multimedia applications and the learning process to be unbound by place and time, providing the flexibility needed during the pandemic. Therefore, this study focuses on the Effectiveness of Using Mobile Applications in Science Learning at MAN 2 Probolinggo Post-Pandemic.

PROBLEM STATEMENT

This study aims to assess the effectiveness of mobile applications in facilitating science learning in a post-pandemic context, focusing on student engagement and understanding of materials.

RESULT

Based on the survey results, every aspect is described as follows. Firstly, the majority of respondents felt that the mobile application was moderately effective in helping them

understand science material, with a very small number of respondents feeling the application was ineffective. Secondly, most respondents experienced increased learning achievement through mobile applications, with a small number of students reporting no change or a decrease in achievement. It shows that mobile applications have great potential to support increased student academic achievement. Thirdly, the majority of respondents felt quite satisfied or very satisfied with the interactions that occurred via mobile applications during science learning. However, a few people feel that this interaction can still be improved. Fourthly, most students felt that the material delivered via the mobile application was sufficient to be very easy to understand, with only a small percentage finding it difficult to understand the material. Lastly, the majority of students experienced an increase in learning motivation, either moderately or greatly increased, with only a few students not feeling any change or experiencing a decrease in motivation. Mobile applications appear to be effective in increasing the learning motivation of most students.

CONCLUSION

This study revealed that using mobile applications in science learning at MAN 2 Probolinggo after the COVID-19 pandemic is very effective in improving students' understanding of the subject matter. These applications are considered very effective or quite effective in helping students understand science material. However, this study also found several technical obstacles students often face, especially slow internet connections and unsupported devices.

ACKNOWLEDGEMENT

The author would like to express his deepest gratitude to the Education Fund Management Institute (LPDP) and the Indonesian Education Scholarship (BPI) for the financial support they have provided for this research.

REFERENCES

Awalia, L. M., Pratiwi, I. A., & Kironoratri, L. (2021). Analisis penggunaan aplikasi pembelajaran daring terhadap minat belajar siswa di Desa Karangmalang [Analysis of the use of online learning applications on student learning interest in Karangmalang Village]. *Jurnal Basicedu*, *5*(5), 3940-3949. https://doi.org/10.31004/basicedu.v5i5.1354

Azhiimah, A. N., Rijanto, T., Nurlaela, L., & Basuki, I. (2021). An analysis of online learning media in promoting learners' autonomy during covid-19 pandemic. *Journal of Physics: Conference Series, 1810*(1), Article 012070. https://doi.org/10.1088/1742-6596/1810/1/012070

Bambang, R. T. (2008). Adjoint EKF learning in recurrent neural networks for nonlinear active noise control. *Applied Soft Computing*, *8*(4), 1498-1504. https://doi.org/10.1016/j.asoc.2007.10.017

Heinich, R. (1996). *Instructional Media and Technologies for Learning*. Merrill.

Karyanto, S., Tandayu, R., Febriani, J., & Kuang, T. M. (2020). Pengaruh media pembelajaran daring terhadap pengetahuan belajar mahasiswa akuntansi [The influence of online learning media on the learning knowledge of accounting students]. *Journal of Accounting, Finance, Taxation, and Auditing (JAFTA)*, *2*(2), 171-186. https://doi.org/10.28932/jafta.v2i2.3279

Nurfadhillah, S., Azhar, C. R., Aini, D. N., Apriansyah, F., & Setiani, R. (2021). Pengembangan media pembelajaran berbasis teknologi untuk meningkatkan hasil belajar siswa Sd Negeri Pinang 1 [Development of technology-based learning media to improve student learning outcomes at Sd Negeri Pinang 1]. *Bintang Jurnal Pendidikan dan Sains, 3*(1), 153-163.

Saputra, M. A., & Isnain, A. R. (2021). Penerapan Smart Village Dalam Peningkatan Pelayanan Masyarakat Menggunakan Metode Web Engeneering (Studi Kasus: Desa Sukanegeri Jaya) [Implementation of Smart village in improving community services using web engineering methods (Case study: Sukanegeri Jaya Village)]. *Jurnal Teknologi dan Sistem Informasi*, *2*(3), 49-55. https://doi.org/10.33365/jtsi.v2i3.940

Sumilat, J. M. (2022). *The Utilization of online media in Calculation Operations Mathematics Learning in Elementary School Students*. Richtmann Publishing Ltd

Tampubolon, R. A., Sumarni, W., & Utomo, U. (2021). Pengaruh pembelajaran daring dan motivasi belajar terhadap hasil belajar siswa di sekolah dasar [The influence of online learning and learning motivation on student learning outcomes in elementary school]. *Jurnal Basicedu*, *5*(5), 3125-3133. https://doi.org/10.31004/basicedu.v5i5.1291

Van, L. K., Dang, T. A., Pham, D. B. T., Vo, T. T. N., & Pham, V. P. H. (2021). The effectiveness of using technology in learning English. *AsiaCALL Online Journal*, *12*(2), 24-40.

Pertanika Proceedings 1 (2): 125 - 131 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Enhancing Primary School Teachers' Professional Competence Through the Technological Pedagogical Content Knowledge (TPACK): A Systematic Literature Review

Siti Ni'matul Fitriyah[1]*, Eddy Sutadji[2] and Radeni Sukma Indra Dewi[1]

[1]*Postgraduate School Program, Basic Education Department, Universitas Negeri Malang, 65145, Malang, Indonesia*

[2]*Postgraduate School Program, Vocational Education Department, Universitas Negeri Malang, 65145, Malang, Indonesia*

ABSTRACT

Technological Pedagogical Content Knowledge (TPACK) is an important framework for effectively integrating technology in education. This research aims to evaluate elementary school teachers' TPACK capabilities, professional skill development, and overall professional competencies. The research methodology used a Systematic Literature review (SLR) with the PRISMA approach, which involved the systematic selection and analysis of 24 relevant articles. The results show that gaps in the understanding and application of TPACK among primary school teachers directly impact the effectiveness of using technology in learning. The implications of these gaps necessitate the development of professional competencies to improve primary school teachers' TPACK skills. This study recommends more focused training programs on the use of various technologies in the learning process for all primary school teachers.

Keywords: Primary school teachers, professional competence, PRISMA, systematic literature review, TPACK

INTRODUCTION

The importance of Information and Communication Technology (ICT) integration in education cannot be overlooked, given its transformative impact on teaching and learning processes. The use of ICT has opened new opportunities to create more interactive, engaging, and effective learning, as well as facilitating access to various learning resources. In this context, teachers play a central role as the main facilitator responsible for integrating technology into the learning process. Teachers' technological

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.023

E-mail addresses:
siti.nimatul.2321038@students.um.ac.id (Siti Ni'matul Fitriyah)
eddy.sutadji.ft@um.ac.id (Eddy Sutadji)
radenisukmaindradewi.pasca@um.ac.id (Radeni Sukma Indra Dewi)
* Corresponding author

proficiency has a direct effect on the quality of education they provide, especially in terms of helping students achieve better learning outcomes.

One relevant framework for measuring teachers' ability to integrate technology is *Technological Pedagogical Content Knowledge* (TPACK). This framework is particularly important for primary school teachers who teach a variety of subjects, as it integrates technological, pedagogical, and content knowledge essential for effective teaching (Mishra & Koehler, 2006). However, many primary school teachers still face challenges in optimally utilizing technology, such as a lack of technology training or limitations in adapting new technologies into their teaching strategies (Hsu et al., 2021; Zhakiyanova et al., 2023).

PROBLEM STATEMENT

This review emphasizes the need for systematic reviews, such as this, to explore the relationship between professional competence and TPACK skills among primary school teachers. A systematic literature review (SLR) follows the PRISMA methodology to ensure transparency and reliability by carefully identifying, screening, and including relevant research. This approach helps identify gaps in research and successful strategies to improve teacher training and competency development. Ultimately, understanding TPACK contributes to creating an educational environment that is aligned with the demands of the digital age.

RESEARCH QUESTIONS

The following study questions have been raised: (1) How is elementary school teachers' TPACK ability? (2) How are primary school teachers' professional skills developed? and (3) How are elementary school teachers' professional competencies? Based on a comprehensive literature analysis, the purposes of this research are to (1) determine elementary school teachers' TPACK ability, (2) determine the growth of professional skills carried out by elementary school teachers, and (3) determine primary school teachers' professional competence.

METHOD

This study used a Systematic Literature Review (SLR) methodology, following the approach outlined by Kitchenham (2014), to systematically locate, assess, and synthesize existing research on TPACK and the professional development of primary school teachers. The SLR provides a comprehensive overview of empirical studies, offering consistent findings. The PRISMA technique (Moher et al., 2010) was utilized to ensure the quality and transparency of the review process. This study focused on articles from Scopus-indexed journals, using specific search queries related to TPACK and professional competence among primary school teachers. The search was limited to articles published between January 2019 and June

2024, which yielded 1,023 articles. After filtering through inclusion criteria (peer-reviewed articles) and exclusion criteria (non-article format and research not directly related to the research question), the number of relevant articles was reduced to 327. In the third stage, further screening was conducted, with a particular focus on studies that addressed TPACK and professional competence among primary school teachers. Abstracts of the remaining articles were reviewed, resulting in 24 articles being shortlisted for in-depth analysis.

RESULTS AND DISCUSSION

Primary School Teachers' TPACK Skills

The Technological Pedagogical Content Knowledge (TPACK) framework has been widely used for over a decade to help educators understand how to integrate technology effectively into their teaching. It emphasizes the combination of technical, pedagogical, and content knowledge to enhance learning experiences. Studies have shown varying levels of TPACK proficiency among teachers. For instance, Zhakiyanova et al. (2023) found that teachers in Kazakhstan had moderately high TPACK scores but varying technological skills between older and younger educators. Hsu et al. (2021) discovered similar differences in Taiwan, where junior teachers showed higher proficiency in pedagogical knowledge than their senior counterparts. However, Zhang et al. (2019) highlighted that senior teachers often have stronger technological knowledge due to their extensive experience. Chaipidech et al. (2022) demonstrated that tailored professional development can significantly improve TPACK skills, particularly in science education. Additionally, Widodo et al. (2022) explored how TPACK, combined with the adversity quotient, helps improve Indonesian teachers' ability to integrate technology into education, offering insights for enhancing teacher training programs.

Primary school teachers' TPACK (Technological Pedagogical Content Knowledge) skills show variations in proficiency, which are influenced by various factors such as age and experience. Such variations can be addressed through the professional development of primary school teachers in integrating technology into the learning process.

Professional Skills Development by Primary School Teachers

The development of professional skills in primary school teachers is achieved through learning and training rather than routine habits (Epstein & Hundert, 2002). Various training models include coaching, transformative practices, and Continuing Professional Development (CPD), which emphasizes ongoing active learning (Kennedy, 2005; Özdemir, 2019). Studies have shown that CPD significantly enhances teachers' professional growth and positively impacts student performance, particularly through collaborative methods like lesson study (Özdemir, 2019). Research by Howell et al. (2021) focused on enhancing teachers' digital writing skills, while Heppt et al. (2022) demonstrated the effectiveness

of professional development in improving language facilitation in science education. Additionally, studies indicate that teacher innovation and professional development contribute positively to student education quality (Asiyah et al., 2021). Action research is also highlighted as a beneficial method for professional development, leading to improved teaching practices and student engagement (Bufasi et al., 2024). Furthermore, training in mindfulness (Akhavan et al., 2021) and computational thinking skills (Kravik et al., 2022) are identified as essential for meeting curricular needs and fostering 21st-century skills among students.

Primary school teachers develop their professional skills through training and active learning. Training models such as coaching, transformative practices and Continuing Professional Development (CPD) are proven to improve teachers' professional growth and student performance, especially with collaborative approaches such as lesson study. In addition, training in mindfulness, digital skills, and computational thinking can improve teaching quality and prepare students for 21st-century skills.

Professional Competence of Elementary School Teachers

Professional competence in elementary school teachers involves a deep mastery of learning materials, including an understanding of curriculum content and the scientific principles behind it. According to Permendiknas No. 16 (2007), this competence is defined by five core competencies: (1) A comprehensive understanding of the subject matter, including its organization and scientific principles; (2) Proficiency in competency standards and foundational skills related to the subject, (3) The ability to innovatively create instructional materials, (4) Continuous professionalism through reflective practice, and (5) Effective use of information and communication technologies for growth and communication.

Research by Lamanauskas et al. (2020) highlights that many teachers recognize the importance of educational research in practice but often struggle due to insufficient professional competence. To bridge this gap, systematic improvements in professionalism are necessary. Engaging future teachers in distance learning with a focus on practical training has been suggested as an optimal approach (Androsova et al., 2023; Elmira, 2021). Enhancing teachers' professional competence can also involve developing emotional intelligence, adversity quotient, and organizational and civic behavior (Widodo et al., 2022). Furthermore, integrating management concepts and andragogy into Continuing Professional Development (CPD) activities may also strengthen teacher competence (Merwe-Muller & Dasoo, 2021). Overall, future advancements in digital technology are expected to further enhance the professional skills of elementary school teachers (Shvardak et al., 2024).

Primary school teachers' professional competence involves a deep understanding of learning materials, including the curriculum and its scientific principles. Continuous training and the development of emotional intelligence and organizational behavior are necessary

to improve these competencies. Digital technology is also expected to further strengthen teachers' professional competence in the future.

CONCLUSION

The conclusion of this study confirms that Technological Pedagogical Content Knowledge (TPACK) skills among primary school teachers still vary, especially in relation to age and experience. It suggests an urgent need for teachers to improve their TPACK skills to meet the challenges of the evolving digital era. The research also highlights the importance of providing more targeted professional development opportunities, especially to address the gap in technology integration among more senior and junior teachers. The implications of these findings are highly relevant for teacher training programs, where curricula and training methods need to be adjusted to better support comprehensive TPACK development.

ACKNOWLEDGEMENT

The authors would like to thank the Ministry of Education, Culture, Research, and Higher Education Technology (Kemendikbudristekdikti) for funding the thesis research in 2024. Additionally, they would like to express their gratitude to the thesis supervisors for their valuable time and diligent effort, which ultimately facilitated the completion of this project.

REFERENCES

Akhavan, N., Goree, J. M., & Walsh, N. (2021). The benefit of mindfulness professional development for elementary teachers: considerations for district and school level leaders. *Journal of School Administration Research and Development*, *6*(1), 24–42. https://doi.org/10.32674/JSARD.V6I1.2462

Androsova, N., Tsukanova, N., Demchenko, Y., Prybora, T., & Tkachenko, O. (2023). Formation of professional competence of future primary school teachers against the background of large-scale military aggression (a response to the challenges of the times). *Journal of Curriculum and Teaching*, *12*(2), 11–18. https://doi.org/10.5430/jct.v12n3p11

Asiyah, S., Wiyono, B. B., Hidayah, N., & Supriyanto, A. (2021). The effect of professional development, innovative work and work commitment on quality of teacher learning in elementary schools of Indonesia. *Eurasian Journal of Educational Research*, *2021*(95), 227–246. https://doi.org/10.14689/EJER.2021.95.13

Bufasi, E., Cakane, I., Dudareva, I., & Namsone, D. (2024). Professional development for primary school teachers intended to promote students' spatial ability. *International Journal of Engineering Pedagogy*, *14*(2), 130–144. https://doi.org/10.3991/ijep.v14i2.43673

Chaipidech, P., Srisawasdi, N., Kajornmanee, T., & Chaipah, K. (2022). A personalized learning system-supported professional training model for teachers' TPACK development. *Computers and Education: Artificial Intelligence*, *3*, Article 100064. https://doi.org/10.1016/j.caeai.2022.100064

Elmira, U. (2021). Formation of information and professional competence of primary school teachers with online education. *World Journal on Educational Technology: Current Issues*, *13*(4), 838–850. https://doi.org/10.18844/wjet.v13i4.6269

Epstein, R. M., & Hundert, E. M. (2002). Defining and assessing professional competence. *Educational Researcher*, *287*(2), 226–235. https://doi.org/10.3102/0013189X020001003

Heppt, B., Henschel, S., Hardy, I., Hettmannsperger-Lippolt, R., Gabler, K., Sontag, C., Mannel, S., & Stanat, P. (2022). Professional development for language support in science classrooms: Evaluating effects for elementary school teachers. *Teaching and Teacher Education*, *109,* Article 103518. https://doi.org/10.1016/j.tate.2021.103518

Howell, E., Perez, S., & Abraham, W. T. (2021). Toward a professional development model for writing as a digital, participatory process. *Reading Research Quarterly*, *56*(1), 95–117. https://doi.org/10.1002/rrq.294

Hsu, C. Y., Liang, J. C., Chuang, T. Y., Chai, C. S., & Tsai, C. C. (2021). Probing in-service elementary school teachers' perceptions of TPACK for games, attitudes towards games, and actual teaching usage: A study of their structural models and teaching experiences. *Educational Studies*, *47*(6), 734–750. https://doi.org/10.1080/03055698.2020.1729099

Kennedy, A. (2005). Models of continuing professional development: A framework for analysis. *Journal of In-Service Education*, *31*(2), 235–250. https://doi.org/10.1080/13674580500200277

Kitchenham, B. (2014). Procedures for performing systematic reviews. *Keele University Technical Report*, *33*(2004), 1–26.

Kravik, R., Berg, T. K., & Siddiq, F. (2022). Teachers' understanding of programming and computational thinking in primary education - A critical need for professional development. *Acta Didactica Norden*, *16*(4), Article 9. https://doi.org/10.5617/adno.9194

Lamanauskas, V., Augienė, D., & Makarskaitė-Petkevičienė, R. (2020). Primary school teachers' educational research: Educational practice and professional development context. *International Journal of Cognitive Research in Science, Engineering and Education*, *8*(3), 1–18. https://doi.org/10.23947/2334-8496-2020-8-3-1-18

Merwe-Muller, L. V. D., & Dasoo, N. (2021). South African teachers' experiences of continuous professional teacher development: Connections and disconnections. *South African Journal of Education*, *41*(4), Article 1919. https://doi.org/10.15700/saje.v41n4a1919

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2010). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *International Journal of Surgery*, *8*(5), 336–341. https://doi.org/10.1016/j.ijsu.2010.02.007

Özdemir, S. M. (2019). Implementation of the lesson study as a tool to improve students' learning and professional development of teachers. *Participatory Educational Research*, *6*(1), 36–53. https://doi.org/10.17275/per.19.4.6.1

Shvardak, M., Ostrovska, M., Bryzhak, N., Predyk, A., & Moskovchuk, L. (2024). The use of digital technologies in professional training of primary school teachers. *International Electronic Journal of Elementary Education*, *16*(3), 363–376. https://doi.org/10.26822/iejee.2024.337

Widodo, W., Gustari, I., & Chandrawaty, C. (2022). Adversity quotient promotes teachers' professional competence more strongly than emotional intelligence: Evidence from Indonesia. *Journal of Intelligence*, *10*(3), Article 44. https://doi.org/10.3390/jintelligence10030044

Zhakiyanova, Z., Zhaitapova, A., Orakova, A., Baizhekina, S., Shnaider, V., & Nametkulova, F. (2023). Investigation of primary school teachers' professional competencies and technological pedagogical content knowledge (TPACK) competencies. *International Journal of Education in Mathematics, Science and Technology*, *11*(5), 1154–1172. https://doi.org/10.46328/ijemst.3604

Zhang, S., Liu, Q., & Cai, Z. (2019). Exploring primary school teachers' technological pedagogical content knowledge (TPACK) in online collaborative discourse: An epistemic network analysis. *British Journal of Educational Technology*, *50*(6), 3437–3455. https://doi.org/10.1111/bjet.12751

Pertanika Proceedings 1 (2): 133 - 140 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Development of Local Wisdom Learning Through Pancasila Education E-modules for Elementary School Students

Sri Suwartini[1]*, Bambang Sumardjoko[1], Harsono[1] and Muhammad Musiyam[2]

[1]Education Department, Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta, Surakarta, 57162, Indonesia
[2]Geography Education, Faculty of Teacher Training and Education, Universitas Muhammadiyah Surakarta, Surakarta, 57162, Indonesia

ABSTRACT

The purpose of this study is to introduce local wisdom to participants who were raised through Pancasila Education learning. This study uses the R&D method with the ADDIE model. The ADDIE model consists of five stages, namely analysis, design, development, implementation, and evaluation, to develop a Pancasila Education e-module oriented to local wisdom. The analysis techniques used are data redaction, reliability testing, and validity testing to test the questionnaire on local wisdom in the module. The feasibility test of the Pancasila Education e-module product-oriented to local wisdom uses material experts, language experts, and e-module presentation experts. Interviews and observations are used to analyze the needs of educators and students. Students often use teaching modules, and with the development of teaching through e-modules, researchers can introduce local wisdom to students. The results of this study are that the Pancasila Education e-module has characteristics that include attractive images on the LKPD display and teaching materials, diverse character animations, learning that is in accordance with the learning stages, and teaching materials that are adapted to local wisdom to increase environmental awareness and introduce local wisdom around students. The learning outcomes achieved by students have also increased. These findings indicate the need for the development of e-modules that are oriented toward local wisdom to foster environmental awareness and introduce local wisdom around students and at school. In conclusion, the development of this e-module is very important so that students are more active in the learning process and create innovative and sustainable educators in Elementary Schools.

Keywords: ADDIE model, e-module, local wisdom, R&D

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.024

E-mail addresses:
q300220004@student.ums.ac.id (Sri Suwartini)
bs131@ums.ac.id (Bambang Sumardjoko)
har152@ums.ac.id (Harsono)
mm102@ums.ac.id (Muhammad Musiyam)
* Corresponding author

e-ISSN: 3083-9475

INTRODUCTION

Education is a transformative experience that shapes an individual's mindset and character. In the Fourth Industrial Revolution era, the education system is expected to cultivate students who think critically, creatively, and innovatively in problem-solving while also promoting communication and collaboration (Yamin & Syahrir, 2020). As cited in Specia and Osman (2015), Bell Hooks describes education as a practice of freedom that fosters an engaging teaching and learning process for both educators and students. However, many students struggle to participate effectively in their learning experiences, leading to less conducive classroom atmospheres due to low motivation, discomfort, inadequate communication skills, mismatched learning styles, and unclear assessments (Anwar, 2017). Therefore, educators must create a conducive learning environment.

Educators play a crucial role in learning and must possess quality teaching skills to nurture a competitive and reputable generation (Murniarti, 2021). As educational policies evolve, teachers must adapt accordingly. One alternative for facilitating independent learning is to utilize e-modules tailored to students' environments. Prastowo (2014) defines e-modules as teaching materials created with accessible language for students, enabling self-directed learning with minimal educator assistance. Anwar (2017) emphasizes that e-learning modules should be systematically designed, combining content, methods, and evaluations to achieve desired competencies. The learning process must extend beyond theoretical understanding, incorporating the students' environment.

Interviews with educators at SD N 1 Wonoboyo reveal a lack of familiarity and confusion in developing e-modules that adapt centrally provided materials to student needs. The development of e-modules must align with the curriculum, student requirements, teaching methods, material quality, and evaluation methods. Consequently, many schools rely solely on government-provided textbooks, which may not suit students' characteristics or environmental contexts (Adnyana & Yudaparmita, 2023). Addressing these educational challenges is essential for ensuring a smooth learning process and facilitating students' comprehension of the material. In the independent learning program, students should think freely and independently when designing e-modules that reflect their characteristics. Educators have the autonomy to select curriculum elements for e-learning modules based on student needs, fostering creativity and critical thinking (Pandapotan, 2018). Culture-based learning models prioritize student work across diverse cultural backgrounds (Supriyadi, 2011). Anwar (2017) argue that this model is vital as it shapes cultural character and national values in elementary education.

PROBLEM STATEMENT

To implement the independent learning program, teachers must design e-modules that challenge students' critical and creative thinking. The quality of e-modules can be assessed

through several aspects: content suitability, language appropriateness, presentation clarity, and graphic quality (Specia & Osman, 2015). By considering these aspects, educators can create effective e-modules that enhance students' motivation and understanding. Research indicates a need to increase environmental awareness through school learning. The lack of local wisdom-based e-modules inspires this study, which aims to develop modules using three learning models: PBL, PJBL, and Discovery Learning.

RESEARCH QUESTION

This research aims to answer the following questions based on the background and literature review. What is the development procedure for Pancasila Education E-modules? What is the validity of Pancasila Education E-modules? What is the impact of using Pancasila Education E-modules on student learning outcomes?

METHOD

According to Amirhud et al. (2021), the orientation of this Research and Development (RnD) approach is to produce products in the form of learning tools for students. This research was developed using the R&D method with the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) development model, according to Sasongko and Purwandari (2023).

RESULTS AND DISCUSSION

Results

Analysis

The interview results revealed that educators had not yet developed electronic learning modules that integrate local wisdom. Students' environmental awareness was still largely influenced by habits at home, and existing electronic learning modules were not yet adapted to the local wisdom surrounding the students. The observations showed that students were less active in learning, educators had not communicated the learning objectives during the opening of lessons, and students were still confused about the local wisdom around them, which impacted their environmental awareness. Moreover, students still hesitated to ask educators questions during the learning process.

Design

The researcher designed the e-module cover using Canva, utilizing the platform's various features. Once the cover was complete, the researcher organized the contents of the e-module. These contents included the validator's name page, foreword, introduction, character descriptions, a concept map of learning outcomes, usage instructions, table of

contents, teaching materials, and the LKPD. In developing the e-module, the researcher incorporated stages from Problem-Based Learning (PBL), Project-Based Learning (PJBL), and Discovery Learning to guide the problem-solving process. Contextual problems were presented to engage students, with the expectation that, by relating the problems to real-life situations, students would better grasp the core issues presented by the teacher. The design of the local wisdom-oriented e-module follows these principles.

Development

In this development stage, the researcher carried out expert validation to obtain the feasibility of the product to be applied to class V students. The researcher used material validation experts, discussion experts, and e-module presentation experts to obtain this feasibility. This stage is carried out before implementing the e-module for class V students. Material field experts obtained a validation questionnaire calculation of 87.34%, declared unrevised/suitable for application. Experts in the language sector obtained a validation questionnaire calculation of 80% without revision, which is feasible to apply. Experts in e-module presentation obtained a questionnaire calculation of 92%, which was declared not revised / suitable for implementation. Expert calculations show that the Pancasila Education e-module, oriented towards local wisdom, can be implemented.

Implementation

Suggestions and input provided by validation experts are corrected first. After the revision, the researcher implemented the e-module for class V students. The implementation process was carried out in 2 meetings. The first meeting applies the material in the e-module and works on the LKPD in the e-module. Students work on all sub-chapters of the local wisdom-oriented LKPD. After implementation, the teacher will give evaluation questions to determine students' understanding of the material and provide questionnaires to determine student responses. This table shows the grades of class V students before the implementation of the e-module. The results of these scores showed that several students were not good.

Table 1 shows the grades of class V students after implementing the e-module. The resulting value is included in the

Table 1
Results of scores before implementing the e-module

Value Criteria	Amount	Percentage
60	1	4%
63	1	4%
67	1	4%
68	4	14%
70	1	4%
74	3	11%
75	1	4%
77	2	7%
78	5	18%
79	1	4%
80	4	14 %
81	3	11 %
82	1	4 %

good category. The improvements before and after were good. These results prove that implementing local wisdom-oriented e-modules can improve student learning outcomes. Understanding of the material "Me and the Environment Around Me" in the Pancasila Education subject is quite good.

Evaluation

Evaluation is the final stage carried out to provide value to products that have been validated and tested. A formative evaluation form is used at this stage, and a student response questionnaire is filled out. The response questionnaire consists of 10 questions. The response questionnaire given to students consisted of 10 questions. These questions include the appearance of the e-module and the learning experienced by students. Each student fills out one questionnaire, after which the results obtained are tested for validity and reliability to determine the level of validity and reliability of the questionnaire. The following are the results of the validity and reliability test of the questionnaire:

Table 2
Validity test and reliability test

School name	Validity test	Reliability Test
SD N 1 Wonoboyo	Valid 10	0,81

Table 2 shows the validity tests for the limited and broad tests are said to be valid because they meet the calculated indicator, which is greater than the t table. The questionnaire given was said to be reliable/reliable because Cronbach's Alpha results were greater than the significance level of 0.6. With good questionnaire test results, students' responses to the application of e-modules are very good.

Discussion

The Pancasila Education e-module features attractive images that enhance teaching materials and LKPD. Created using Canva, these images stimulate curiosity, concentration, and interest in learning (Fajri et al., 2022). They significantly influence learning outcomes by engaging students and helping them understand the material (Adnyana & Yudaparmita, 2023; Efend, 2021). Animated images, in particular, are effective learning tools (Prilosadoso et al., 2021). The e-module's animated characters enhance engagement, especially for fifth-grade students, and reduce reading monotony (Fitri & Ardipal, 2021). Integrating animation encourages student involvement, boosting interest and positively influencing learning outcomes (Annisya & Baadilla, 2022). Clear learning stages help educators effectively guide the learning process. The LKPD aligns with PBL, PJBL, and Discovery learning models, facilitating learning even without memorization (Abarang & Delviany, 2021).

Incorporating local wisdom helps convey core content effectively, enriching the educational experience and fostering character education (Nurafni et al., 2020). Contextual learning using local wisdom heightens environmental awareness and aligns with current curricula, promoting effective teaching (Kormasela et al., 2020). The feasibility of the Pancasila Education e-module was evaluated by three experts holding doctoral degrees. The results of the validation tests showed that the material expert gave a score of 87.34%, the language expert gave 80%, and the e-module presentation expert gave 92%. These scores indicate that the e-module is suitable for use without the need for revision. This validation confirms that the e-module meets the established indicators and is appropriate for educators and fifth-grade students in elementary schools. Additionally, the e-module has been aligned with the current independent curriculum. The effectiveness of the Pancasila Education e-module is oriented towards local wisdom.

The effectiveness of the Pancasila Education e-module oriented to local wisdom is evident from the comparison of student learning outcomes before and after its implementation. Initially, scores from tests consisting of 10 multiple-choice and five essay questions, based on the topic "My Environment," were below the standard completion score, ranging from 60 to 82. After using the e-module, scores improved to 80–90, exceeding the standard completion score. In addition to better academic performance, students demonstrated the ability to express opinions and suggest ways to maintain environmental awareness and protect their surroundings.

CONCLUSION

The Pancasila Education e-module oriented towards local wisdom features attractive images in the LKPD and teaching materials, animations of various characters, learning content aligned with stages, and teaching materials adapted to local wisdom to promote environmental awareness. This product enhances students' environmental awareness and has been evaluated by several experts. Material experts rated it 87.34%, linguistic experts 80%, and e-module presentation experts 92%, declaring it suitable for use without revision. Learning outcomes improved significantly after implementing the e-module, with students demonstrating a notable difference in performance and the ability to express opinions on environmental awareness.

ACKNOWLEDGEMENT

The authors extend their heartfelt gratitude to the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia for supporting this research on "Development of Local Wisdom Learning Through Pancasila Education E-modules for Elementary School Students".

REFERENCES

Abarang, N., & Delviany, D. (2021). Increasing student learning outcomes by using the problem based learning (PBL) learning model. *Journal of Education and the Teaching Profession, 1*(2), 1-7.

Adnyana, K. S., & Yudaparmita, G. N. A. (2023). Increasing students' interest in learning by implementing visual apperception using the problem based learning model. *Edukasi: Jurnal Pendidikan Dasar*, *4*(1), 61-70. https://doi.org/10.35580/lageografia.v20i3.36063

Annisya, S., & Baadilla, I. (2022). Analysis of character values through fable animation media in indonesian language learning for elementary school students. *Basicedu Journal, 6*(5), 7888-7895.

Anwar. (2017). Development of an integrated thematic learning module based on local wisdom in sumenep regency class IV sub-theme my living environment. *Journal of Education,2*(10), 1291- 1297

Efendi, M. A. (2021). The use of pictures as media to improve students' reading comprehension. *Journal of English Teaching, Literature, and Applied Linguistics*, *2*(2), 84-86. https://doi.org/10.30587/JETLAL.V2I2.2467

Fajri, Z., Toba, R., Muali, C., Ulfah, M., & Zahro, F. (2022). The Implications of Naturalist Illustration Image Media on Early Childhood Learning Concentration and Motivation. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(4), 3278-3290. https://doi.org/10.31004/obsesi.v6i4.2092

Fitri, F., & Ardipal, A. (2021). Developing learning videos using the Kinemaster application for thematic learning in elementary schools. *Basicedu Journal, 5*(6), 6330-6338.

Kormasela, D. A., Dawud, D., & Rofi'uddin, A. H. (2020). *Utilization of Maluku local wisdom in developing teaching materials for writing procedure texts for Class VII students* [Doctoral dissertation, State University of Malang]. State University of Malang. http://journal.um.ac.id/index.php/jptpp/

Murniarti, E. (2021). Analysis of teacher pedagogical competencies in online learning during the covid-19 pandemic. *Educative: Journal of Education Science, 3*(4), 1418-1427.

Nurafni, A., Pujiastuti, H., & Mutaqin, A. (2020). Development of trigonometry teaching materials based on local wisdom. *Journal of Medicine: Journal of Mathematics Education IKIP Veteran Semarang, 4*(1), 71-80.

Pandapotan, S. (2018) Inventory of Karo Ethnic local wisdom in the use of ethnobotany in Karo Regency. *Journal of Education, Humanities and Social Sciences, 1*(1), 43-50.

Prastowo, A. (2014). *Development of Thematic Teaching Materials, Theoretical and Practical Review*. Pranadamedia Group

Prilosadoso, B. H., Kurniawan, R. A., Pandanwangi, B., & Yunianto, I. K. (2021). The appeal of cartoon characters in instructional media through animation in early childhood education in Surakarta. *International Journal of Social Sciences*, *4*(1), 35-38. https://doi.org/10.31295/IJSS.V4N1.430.

Sasongko, D., & Purwandari, S. (2023). Application of the Addie method in the development of interactive comics as a media for educating children about personal data security. Indonesian *Journal: Information and Communication Management, 4*(2), 698-708. https://doi.org/10.35870/jimik.v4i2.267

Specia, A., & Osman, A. A. (2015). Education as a Practice of Freedom: Reflections on bell hooks. *Journal of education and Practice*, *6*(17), 195-199.

Supriyadi. (2011, July 21-23). *Ethnomathematics learning using stick media in mathematical multiplication operations to improve the creative character and love of local culture of PGSD students*. [Paper presentation]. Proceedings of the STKIP Siliwangi National Seminar, Yogyakarta, Indonesia.

Yamin, M., & Syahri (2020). Development of independent learning education (Study of learning methods). *Mandala Education Scientific Journal, 6*(1), 126-136.

Pertanika Proceedings 1 (2): 141 - 146 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Implementation of Citizenship Education Learning and Habituation Towards Civic Disposition Cultivation in Elementary Schools

Suhimo

Department of Civic Education, Faculty of Social Science Education, Indonesian University of Education, Bandung 401554, Indonesia

ABSTRACT

Developing citizenship competencies in the 21st century has become crucial. Therefore, instilling citizenship character, especially in students, is essential to help them filter out negative influences. This research explores and focuses on implementing Civic Education and habituation at SDN 3 Cengkong to foster character in citizenship amidst the influence of globalization and technological advancements. The research method used is descriptive qualitative, aiming to describe the implementation of civic Education and habituation in SDN 3 Cengkong. The research data were collected through observation, interviews, and documentation techniques. The data analysis involves data collection, reduction, presentation, and conclusion. Civic Education instills citizenship character by teaching moral values and norms and promoting disciplined, honest, tolerant, and responsible attitudes. Effectively implementing habituation at SDN 3, Cengkong can instill citizenship character competencies in students through flag ceremonies, Dhuha prayers, packed lunches, and scouting extracurricular activities. The collaboration between Civic Education and habituation has a significant influence on instilling students' civic disposition competencies at SDN 3 Cengkong.

Keywords: Civic disposition, civic education, habituation

INTRODUCTION

Forming a character of citizenship amid the rapid influence of globalization is crucial. The influence of globalization that has entered the joints of life, if we cannot distinguish between positive and negative, will certainly have fatal consequences, such as a decline in national character. Moral deviations in students mostly occur because there are underlying factors, including the low religious aspect in students, which causes them to behave defiantly from the beliefs

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.025

E-mail address:
suhimo99@gmail.com

e-ISSN: 3083-9475

they adhere to. Second, ineffective character-building is carried out by parents, educational institutions, and society (Tohri et al., 2022). Education in Indonesia is facing the erosion of the values of authenticity as a respectable and dignified nation (Herlambang, 2018). Therefore, it is necessary to have facilities that aim to shape the character of citizens, especially for the nation's generations.

In the midst of the hustle and bustle of the moral crisis of the Indonesian nation, it is necessary to develop civic disposition in the nation's generation so that they have private or public characters that reflect a citizen who is able to play an active role in national life as Branson (1999) emphasized that civic disposition can be developed through the family, school, community, and civil society environments which ultimately lead to the formation of private and public characters. Branson further emphasized that private characteristics include having a disciplined attitude, mutual respect between individuals, and moral responsibility. Public characters have an attitude of awareness as citizens, are friendly, obedient to the rules, critical thinkers, accept suggestions from others and can negotiate.

The formation of the citizenship character of the young generation of the nation can be instilled through civic education subjects because the content of civic Education includes three important basic elements of civic competence that must be possessed by a citizen, namely civic knowledge, civic skills, and civic disposition (Winataputra & Budimansyah, 2012). Furthermore, Civic Education aims to develop various student competencies, knowledge, skills, and attitudes. It aims to shape students into good citizens, in accordance with Pancasila, the 1945 Constitution of the Republic of Indonesia and the unity in diversity (Zalmi & Montessori 2024).

Habituation is a strategy to create various situations and conditions that contain various reinforcements to form behavior in accordance with internalized and personalized values such as character and personality in schools, families and communities (Susanto & Komalasari, 2016). The formation of students' characters can not only be formed through curricular learning, but the character or personality of children, especially in elementary schools, can be through habituation, training and methods to form individuals with noble morals.

PROBLEM STATEMENT

Developing citizenship competencies in the 21st century has become crucial. Therefore, instilling citizenship character, especially in students, is essential to help them filter out negative influences.

RESEARCH QUESTION

This research aims to explore and focus on how the implementation of Civic Education and habituation at SDN 3 Cengkong fosters citizenship character amidst the influence of globalization and technological advancements.

This research is a descriptive study with a qualitative approach that aims to describe the implementation of civic Education and habituation in instilling civic disposition in public Elementary School 3 Cengkong, Karawang Regency, West Java Province. This research was conducted in July 2024. Data were obtained through in-depth interviews with the principal, teachers, and students, as well as through observations of the implementation of Civic Education and habituation and documentation that supports this research. This study uses the Miles & Huberman analysis model, which consists of three stages: data reduction, data presentation, and conclusion. The validity of the data was tested using a triangulation technique that combines interviews, observations, and documentation.

RESULT AND DISCUSSION

Implementation of Citizenship Education in Forming Civic Disposition

In the implementation of Civic Education, teachers often correlate learning materials with relevant situations and conditions and how to apply Pancasila values in the context of everyday life. Teacher guidance is the main key for students in State Elementary School 3 Cengkong in an effort to instill students' civic disposition. Then, the learning methods applied by teachers in State Elementary School 3 Cengkong are part of the process of forming civic disposition. For example, teachers often apply simulation-based learning, group discussions, and project-based learning. The methods applied by these teachers train students to think critically, work together in completing tasks, accept input from others, learn to negotiate, and be disciplined and responsible.

The output of civic Education for students at Elementary School 3 Cengkong is reflected in the behavior of students who obey school rules, are disciplined in learning, care about the environment, and do not litter. Students with civic disposition values can behave politely towards teachers, parents and peers. Education and learning in elementary schools are one means of developing student character. One is civic Education, which provides students with learning and guidance from an early age on becoming good citizens.

Flag Ceremony Habituation in Developing Civic Disposition

The flag ceremony is held every Monday at the third elementary school of Cengkong, which all school residents attend as a form of respect for the state's attributes and as an effort to increase students' nationalism. The flag ceremony is one means of instilling civic disposition in the third elementary school of Cengkong. The values contained in the flag ceremony activities include strengthening moral values, character building, and identity as citizens.

The development of students' civic character is emphasized when the ceremony instructor delivers a message or speech containing moral messages to students as a basis

for students to behave in everyday life, such as behaving honestly, being polite to elders, maintaining harmony between each other, and obeying applicable regulations both at school and in society. The flag ceremony is an effective means of instilling students' civic disposition with the support of teachers. Character formation in public schools 3 Cengkong as an actualization of the school's vision and mission.

Obstacles in the flag ceremony held at Elementary School 3 Cengkong often occur, such as teachers needing time to condition students to line up according to their class; this shows that there are still some less disciplined students; in addition, students are less solemn when the ceremony is taking place because they often joke with other students, some students often refuse and lack confidence when assigned as ceremony officers. This behavior reflects that students have a low attitude of responsibility. However, the school must evaluate students' personalities, namely, that they are disciplined, responsible, and obey school regulations.

Dhuha Prayer in Instilling Civic Disposition

The habituating congregational dhuha prayer program is a planned program designed to shape students' character. The view of teachers and principals at Elementary School 3 Cengkong is that the process of character formation in students requires a process and time as well as guidance from parents, schools and the community. Congregational dhuha prayer that is carried out in addition to developing students' religious character also has great potential in shaping students' character, especially in elementary school environments.

The implementation of the dhuha prayer at Elementary School 3 Cengkong, the dhuha prayer teaches students to be disciplined, responsible, participate, have a positive attitude towards norms of habit and respect differences. The habit of dhuha prayer has a relationship in instilling civic disposition in students, which can be reflected in both private and public characters; for example, the behavior of students at Elementary School 3 Cengkong has an attitude of respecting their elders, fulfilling their obligations, fostering an attitude of tolerance, and obeying the rules. Thus, in the school's efforts to instill civic disposition through congregational dhuha prayer, teachers have an extra role in guiding students to have good morals.

The Habit of Bringing Lunch Boxes to Instill Civic Disposition

The habituation program of bringing food supplies is one of the programs designed at the third Cengkong State Elementary School. This program is motivated by the large amount of plastic waste in the school environment, so habituation becomes one of the solutions to reduce the use of single-use plastic. Civic disposition values that can be integrated with this habituation program increase the sense of responsibility to protect the environment.

Students participated and were enthusiastic about following the program. It indicates that bringing food from home teaches students to participate in various positive activities. Training student participation will be useful in the future because students will become citizens aware of their rights and obligations.

The habituation programmed in Elementary School 3 Cengkong correlates with instilling civic disposition in students. These habits guide students, who are accompanied by teachers who teach them about the importance of having attitudes and behaviors in accordance with applicable values and norms.

Scout Extracurricular Activities in Forming Civic Disposition

Civic disposition cultivation is performed through scouting extracurricular activities based on Tri Satya and Dasa Darma. Tri Satya can be defined as the formation of student character to have devotion to God Almighty, an attitude of respect for others, and politeness both in the school and the community. At the same time, Dasa Darma can be integrated into forming student character and behavior, including honesty, discipline, and responsibility. Students scouting extracurricular activities at State Elementary School 3 Cengkong show notable changes in their attitudes and behaviors. It indicates that extracurricular activities can be a means to form students' personalities who have a spirit of nationalism and patriotism.

Students who participate in extracurricular scouting activities, teachers and scout leaders at Elementary School 3 Cengkong argue that while students participate in extracurricular scouting activities, many programs can correlate with the instillation of students' civic disposition, for example, social service activities, this activity aims to foster a sense of caring for the student's social environment. However, there are other activities. For example, camping activities and competitions where these activities are able to train students to work together and solve the challenges they face and can train students' thinking skills to find various solutions and innovations.

CONCLUSION

Instilling civic disposition in students from an early age is very important. Civic Education and habituation are two important components in forming the civic disposition of students in Elementary School 3 Cengkong. Civic Education provides a deep understanding of citizens' national values, rights and obligations and teaches good behaviors such as discipline, obeying regulations and social concern. Through habituation such as flag ceremonies, dhuha prayers, bringing food supplies, and scouting. Students are trained to consistently apply the values contained in these habits. Combining the two has proven effective in instilling civic disposition in elementary school students. Thus, children have begun to be equipped with civic values and skills to become good and responsible citizens from an early age.

ACKNOWLEDGEMENT

This research is expected to contribute to the development of character education, especially in cultivating civic disposition in elementary school environments. I hope this research can be useful for educators, researchers and education policymakers.

REFERENCES

Branson, MS (1999). *Learning "Civic Education" from America (Translation by Syarifudin et al.)*. LKIS.

Herlambang, Y. T. (2018). *Pedagogy: Critical Review of Educational Science in Multiperspective*. Bumi Aksara.

Susanto, E., & Komalasari, K. (2016). The influence of learning, habituation and extracurricular activities on the formation of civic disposition of senior high school students in Bandar Lampung City. *Scientific Journal of Democracy Forum* , *15*(1), 60-86.

Tohri, A., Rasyad, A., Sururuddin, M., & Istiqlal, L. M. (2022). The urgency of sasak local wisdom-based character education for elementary school in East Lombok, Indonesia. *International Journal of Evaluation and Research in Education*, *1*(1), 333-344.

Winataputra, U. S., & Budimansyah, D. (2012). *Citizenship Education in an International Perspective (Context, Theory, and Learning Profile). Bandung.* Widya Aksara Press.

Zalmi, P. O., & Montessori, M. (2024). Learning pancasila and citizenship education and school culture in developing civic disposition values of students at SMPN Kota Padang. *Journal of Educational Development, 10*(1), 9-22. https://doi.org/10.21831/jppfa.v10i1.45549

Pertanika Proceedings 1 (2): 147 - 151 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Technology Acceptance Among English Teachers: A UTAUT Framework to Merdeka Mengajar Platform (PMM)

Syafruddin[1]*, Margana[1], Yuyun Yulia[1], Metria Dicky Putra[1], I Made Rian Irwanto[1] and Toyib[2]

[1]*English Education Department, Faculty of Languages, Arts, and Culture, State University of Yogyakarta, 55281, Yogyakarta, Indonesia*
[2]*Education Management, Faculty of Education, State University of Yogyakarta, 55281, Yogyakarta, Indonesia*

ABSTRACT

This study explored the acceptability of the Merdeka Mengajar Platform (PMM) among Indonesian English educators using the UTAUT framework. Fifty English teachers completed a questionnaire, and data were analyzed through structural equation modeling. Key factors examined included Behavioral Intention (BI), Use Behavior (UB), Social Influence (SI), Effort Expectancy (EE), Performance Expectancy (PE), and Facilitating Conditions (FC). Results revealed that Effort Expectancy significantly influenced Behavioral Intention in 73.3% of respondents, while Performance Expectancy and Social Influence had no significant impact. Facilitating Conditions also did not affect Use Behavior. The study highlighted the importance of improving user-friendly features to enhance Behavioral Intention. Future research should investigate why Performance Expectancy and Social Influence have limited effects on technology adoption in education.

Keywords: Behavioral intention, English teachers, PLS-SEM, PMM, technology acceptance, use behavior, UTAUT

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.026

E-mail addresses:
syafaliamd@gmail.com (Syafruddin)
margana@uny.ac.id (Margana)
yuyunyulia@uny.ac.id (Yuyun Yulia)
metriadicky.2024@student.uny.ac.id (Metria Dicky Putra)
ryan.irwanto@gmail.com (I Made Rian Irwanto)
Toyibun23@gmail.com (Toyib)
* Corresponding author

INTRODUCTION

Technology has revolutionized teaching and learning processes in education in recent years, becoming an essential component of the curriculum. It is becoming more widely accepted that integrating digital tools and platforms into the classroom can improve instruction, develop students' problem-solving abilities, and increase student engagement (Khan & Emara, 2018). The Merdeka Mengajar Platform (PMM),

created to support educators in providing high-quality instruction in line with the Merdeka Curriculum, is one example of an invention in Indonesia. This platform offers a wealth of resources that promote a more dynamic and interactive learning environment, such as lesson plans, teaching materials, and assessment tools (Ikram et al., 2023; Marisana et al., 2023; Pusat Informasi Kemendikbud, n.d.).

The benefits that PMM offers, like resource sharing and teacher cooperation, underscore its significance in the field of education. According to Weng et al. (2018), teachers can cooperate and exchange resources more effectively when they use technology-based teaching tools like those offered by PMM. To be fully effective, however, PMM platforms need to properly understand the aspects impacting teachers' adoption and usage of these digital tools. It is necessary to address a number of issues that affect teachers' readiness and willingness to adopt these advances to successfully integrate technology into education (Erni et al., 2023; Lestari & Khusyairi, 2023; Sudarsih, 2023).

PROBLEM STATEMENT

Despite the advantages of technology, barriers remain to its adoption in classrooms. Various factors affect teachers' willingness and ability to use digital tools. The Unified Theory of Acceptance and Use of Technology (UTAUT) offers a comprehensive framework to explore these issues. Understanding these factors is crucial for improving the effectiveness of educational platforms like the Merdeka Mengajar Platform (PMM).

RESEARCH QUESTIONS

This study explores the factors influencing English teachers' use of the Merdeka Mengajar Platform (PMM) by applying the UTAUT model, aiming to guide platform improvements for better adoption. The main constructs examined include Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC), with Behavioral Intention (BI) and Use of Behavior (UB) as dependent variables (Venkatesh et al., 2003). Hypotheses suggest that PE, EE, and SI influence BI, while UB is strongly affected by FC and BI. Data were gathered via a survey of 50 English teachers in Indonesia using a structured questionnaire with a five-point Likert scale.

The Indonesian Ministry of Education 2023 designed PMM to support the Merdeka Curriculum, providing resources for lesson planning, student assessment, and professional collaboration. Research shows that PMM enhances teaching efficiency and integrates technology into classrooms (Hakim & Abidin, 2024; Wang et al., 2023). Analyzing data with partial least squares structural equation modeling (PLS-SEM), the study finds that EE significantly impacts BI, while PE and SI do not. Most participants, with 6-10 years of teaching experience, use both digital and traditional resources and favor discussion-based methods, indicating a strong integration of PMM into their teaching practices. This study's

insights contribute theoretically and practically to the platform's development, addressing the digital shift in education (Venkatesh et al., 2003).

Based on the provided data, Figure 1 shows the significant and non-significant paths, along with the respective p-values, that indicate the strength and impact of each factor on Behavioral Intention (BI) and Use Behavior (UB). For example, Behavioral Intention (BI) has a significant impact on Use Behavior (UB). In contrast, other factors like Performance Expectancy (PE) and Social Influence (SI) do not have a significant impact on Behavioral Intention.

The results indicated that effort expectation is a major factor influencing teachers' BI to use PMM. This result is consistent with earlier studies that highlight the significance of usability in the adoption of technology (Venkatesh et al., 2003). In addition, the fact that PE and SI had no discernible effect on behavioral intention raised the possibility that teachers might place more value on usability than on perceived performance gains or peer pressure (Al-Rahmi et al., 2019). Thus, the lack of significance for Facilitating Conditions indicates that while resources and support are necessary, they are insufficient without strong Behavioral Intention to drive actual usage.

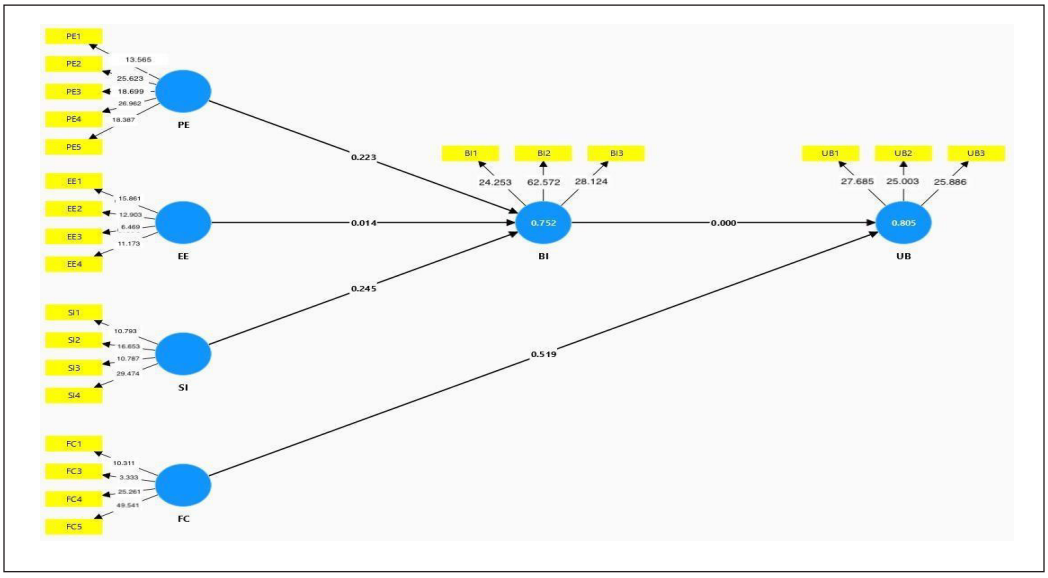

Figure 1. Structural model

CONCLUSION

This survey indicates that English teachers had a generally positive opinion of the Merdeka Mengajar Platform (PMM), with a Behavioral Intention (BI) score of 3.933, or around 73.3% approval. It suggests that there is a good chance that educators will use PMM in their instruction. The results emphasize the importance of components such as

simplicity of use and the requirement for a welcoming environment in promoting PMM adoption. Policymakers and school administrators should strengthen the platform's usability, performance features, and teacher support and resource availability to secure its long-term viability. To boost acceptance, future iterations of PMM should prioritize enhancing the user experience and providing additional professional development opportunities. Further studies should look at other factors that might influence technology uptake, like teachers' opinions on digital teaching, as well as the long-term effects of PMM on student outcomes.

ACKNOWLEDGMENTS

This article is part of the ongoing megister study at the Faculty of Language, Arts and Culture currently being pursued by the first author at Universitas Negeri Yogyakarta (UNY), Indonesia. We would like to thank the Higher Education Funding Agency (BPPT) and the Education Fund Management Agency (LPDP) of the Republic of Indonesia for providing the Indonesian Education Scholarship (BPI) so that the first author can pursue this education.

REFERENCES

Al-Rahmi, W. M., Yahaya, N., Aldraiweesh, A. A., Alamri, M. M., Aljarboa, N. A., Alturki, U., & Aljeraiwi, A. A. (2019). Integrating technology acceptance model with innovation diffusion theory: An empirical investigation on students' intention to use e-learning systems. *IEEE Access*, *7*, 26797–26809. https://doi.org/10.1109/ACCESS.2019.2899368

Erni, E., Supriadi, S., Usman, U., & Rusti, R. (2023). Training on the use of the independent teaching platform for elementary school teachers. *Jurnal Ilmu Pengetahuan dan Teknologi Bagi Masyarakat*, *3*(2), 97-103. https://doi.org/10.30605/ipmas.3.2.2023.299

Hakim, A., & Abidin, M. (2024). The integration of technology in enhancing teacher performance. *Journal of Educational Technology, 13*(2), 89-104. https://doi.org/10.59373/kharisma.v3i1.47

Ikram, F. Z., Anaguna, N., & Rosidah, R. (2023). Utilization of Merdeka Mengajar platform by productive mathematics teachers: Impacts, motivations, and strategies. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *9*(4), Article 1195. https://doi.org/10.33394/jk.v9i4.8936

Khan, M., & Emara, M. (2018). Effect of technology use in education. *International Journal of Pedagogical Innovations*, *6*(2), 44–47. https://doi.org/10.12785/ijcnt/060202

Lestari, Y. I., & Khusyairi, J. A. (2023). Becoming platformized teacher in digital Age : The Representation of English teacher identity in Merdeka mengajar. *English Language & Literature International Conference*, *6*(1), 574-592.

Marisana, D., Iskandar, S., & Kurniawan, D. T. (2023). Penggunaan platform Merdeka mengajar untuk meningkatkan kompetensi guru di sekolah dasar [Using the Merdeka Teaching platform to increase

teacher competency in elementary schools]. *Jurnal Basicedu*, *7*(1), 139–150. https://doi.org/10.31004/basicedu.v7i1.4363

Pusat Informasi Kemendikbud. (n.d.). *What is the Merdeka Mengajar platform?* Pusat Informasi Kemendikbud. https://pusatinformasi.guru.kemdikbud.go.id/hc/id/articles/6090880411673-Apa-Itu-Platform-Merdeka-Mengajar?

Sudarsih, S. (2023). Analysis of the need for using the independent teaching platform to improve teacher performance in schools. *FINGER : Jurnal Ilmiah Teknologi Pendidikan*, *2*(3), 95–101. https://doi.org/10.58723/finger.v2i3.146

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Wang, C., Zhang, M., Sesunan, A., & Yolanda, L. (2023). *The role of technology in transforming education in indonesia: A review of the current impact of the Merdeka Belajar movement*. Pusat Informasi Kemendikbud. https://www.kemdikbud.go.id/main/files/download/9d18462daed4a78?

Weng, F., Ho, H. J., Yang, R. J., & Liu, C. (2018). A TAM-based study of the attitude towards use intention of multimedia among school teachers. *Education and Information Technologies, 23*, 251-271. https://doi.org/10.1007/s10639-017-9603-2

Pertanika Proceedings 1 (2): 153 - 156 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Challenges Faced by Students in Developing Mathematical Literacy Skills in the Indonesia-Malaysia Border Area

Totok Victor Didik Saputro[1]*, Yosua Damas Sadewo[2], Pebria Dheni Purnasari[3], Silvester[1], Felisitas Viktoria Melati[1] and Falenthino Sampouw[4]

[1]Elementary Teacher Education, Institut Shanti Bhuana, Bengkayang, 79211, Indonesia
[2]Educational Technology, Universitas Negeri Jakarta, Jakarta, 13220, Indonesia
[3]Primary Education, Universitas Negeri Yogyakarta, Yogyakarta, 55281, Indonesia
[4]Mathematics Education, Universitas Papua, Papua Barat, 98314, Indonesia

ABSTRACT

Mathematical literacy skills play a crucial role in meeting the demands of the modern world. However, developing these skills causes significant challenges, particularly in the Indonesia-Malaysia border region. This study aims to identify and analyze the specific challenges prospective primary education teachers face in developing mathematical literacy skills while teaching basic mathematical concepts in the border area. The research employs a qualitative design using semi-structured interviews, focus group discussions, and classroom observations for in-depth data collection. The subjects of the study are 55 undergraduate students enrolled in the Primary Education Study Program, which takes the "Basic Concepts of Mathematics II course. The data were analyzed using thematic analysis to identify themes and patterns related to the challenges in developing mathematical literacy skills. The findings reveal that the challenges faced by prospective primary education students are centered on two aspects, namely, knowledge of mathematical literacy skills and the implementation of teaching methods in developing mathematical literacy skills.

Keywords: Border area, educational challenges, mathematical literacy skills

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.027

E-mail addresses:
totok.victor@shantibhuana.ac.id (Totok Victor Didik Saputro)
yosuadamassadewo_9902921035@mhs.unj.ac.id (Yosua Damas Sadewo)
pebria.dheni@shantibhuana.ac.id (Pebria Dheni Purnasari)
silvester@shantibhuana.ac.id (Silvester)
felisitas@shantibhuana.ac.id (Felisitas Viktoria Melati)
f.sampouw@unipa.ac.id (Falenthino Sampouw)
* Corresponding author

INTRODUCTION

The Merdeka Belajar Kampus Merdeka (MBKM) policy is one of the initiatives being promoted by the government for implementation in higher education (Supriati et al., 2022). MBKM is an independent and versatile higher education learning model designed to create a creative learning community that does not impose limits and

meets students' needs (Danuwikarsa & Khori, 2024). The MBKM program, mandated by the Minister of Education and Culture Regulation No. 3 2020, aims to create competitive individuals with diverse learning experiences and competencies, including mathematical literacy, promoting healthy, intelligent, adaptive, creative, innovative, skilled, dignified, and productive individuals.

Mathematical literacy is the ability to apply mathematical knowledge and skills in a variety of real-world contexts (Sitopu et al., 2024). It involves more than just solving equations or performing calculations; it encompasses understanding, interpreting, and communicating mathematical ideas effectively (Hwang & Ham, 2021). Students who excel in math can think critically, solve problems using math, and make decisions based on data. These skills are crucial in a data-focused world. Students along the Indonesia-Malaysia border face challenges due to limited resources, inconsistent teaching quality, and economic inequalities. (Nurmasari et al., 2024). Additionally, cultural and linguistic diversity can further complicate teaching and learning. Addressing these challenges requires targeted interventions such as teacher training, curriculum adaptation, and resource allocation to ensure that all students, regardless of location, can develop strong mathematical literacy skills.

Furthermore, mathematical literacy is about mastering content and students' abilities to analyze, reason, and solve daily mathematics problems (Hapsari et al., 2022). This study examines the challenges faced by prospective primary education students in developing their mathematical literacy skills, particularly in the Indonesia- Malaysia border regions, as they prepare to become future primary school teachers and significantly influence future students' abilities.

PROBLEM STATEMENT

This study aims to identify and analyze the challenges faced by prospective primary education teachers in the Indonesia-Malaysia border region in mastering and implementing mathematical literacy concepts while teaching basic skills in these challenging contexts.

RESEARCH QUESTIONS

How does the knowledge of mathematical literacy skills among prospective primary education teachers influence their ability to teach basic mathematical concepts effectively? This qualitative study explores the challenges elementary school teacher candidates face in developing mathematical literacy skills in the Indonesia-Malaysia border areas. It uses purposive sampling to select 55 university students, with 12 chosen for in-depth interviews. Data collection includes a questionnaire on students' self-perceived challenges and semi-structured interviews (Creswell & Poth, 2016; Merriam & Tisdell, 2015). Data analysis follows a three-step process—data reduction, display, and conclusion drawing—using open coding to identify themes. Validity is ensured through member checking and peer

review (Corbin & Strauss, 2014; Miles & Huberman, 1994; Patton, 2014). The study aims to uncover barriers affecting students' pursuit of mathematical literacy.

The study assessed students' mathematical literacy using various indicators, showing 25.45% understanding of quantity, number systems, and algebraic properties, 7.27% understanding of abstraction and symbolic representation, 20% understanding of mathematical structures, and 16.36% understanding of functional relationships. Low mathematical literacy impacts personal career growth and financial decision-making, and at the societal level, it affects economic productivity and social equity (Hoareau & Tazouti, 2024). Addressing this requires better education, teacher training, and early interventions (Callingham & Watson, 2024).

Implementing a curriculum to foster mathematical literacy requires several key elements: a focus on conceptual understanding, computational skills, and real-world applications of math (Copur-Gencturk & Li, 2023; Hapsari et al., 2022). Differentiated instruction should address diverse student needs, while technology can enhance learning through simulations and interactive tools. Assessment should cover all aspects of mathematical literacy, ensuring a holistic approach (Sreylak et al., 2022). Curriculum adaptation, teacher training, material access, community involvement, and student support are crucial for improving mathematical literacy in low-resource areas, especially border regions. (Purnasari et al., 2023; Saputro et al., 2024).

CONCLUSION

Primary teacher candidates in the Indonesia-Malaysia border regions face major challenges in developing mathematical literacy due to limited instructional materials, socio-economic disparities, and cultural differences. Their varying proficiency levels highlight insufficient support. To address this, schools must enhance resources, offer targeted teacher training, and adopt inclusive, culturally responsive practices to better support students and improve their mathematical literacy skills.

ACKNOWLEDGEMENT

The authors would like to thank the Research and Community Service Center of Institut Shanti Bhuana, Indonesia, for funding this research, which enabled its successful execution and advanced knowledge in developing mathematical literacy skills among Primary Teacher Education students in the border area.

REFERENCES

Callingham, R., & Watson, J. (2024). Statistics education research at the school level in Australia and New Zealand: A 30-year journey. *Mathematics Education Research Journal*, *36*(Suppl 1), 91–122. https://doi.org/10.1007/s13394-023-00470-0

Copur-Gencturk, Y., & Li, J. (2023). Teaching matters: A longitudinal study of mathematics teachers' knowledge growth. *Teaching and Teacher Education*, *121*, Article 103949. https://doi.org/10.1016/j.tate.2022.103949

Corbin, J., & Strauss, A. (2014). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Sage publications.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Sage publications.

Danuwikarsa, I., & Khori, A. (2024). Implementation of the Merdeka Belajar Kampus Merdeka (MBKM) curriculum: Challenges and opportunities in higher education management. *Journal of Educational Research, Science and Technology*, *1*(1), 14–18.

Hapsari, I. P., Saputro, T. V. D., & Sadewo, Y. D. (2022). Mathematical literacy profile of elementary school students in Indonesia: A scoping review. *Journal of Educational Learning and Innovation (ELIa)*, *2*(2), 279–295. https://doi.org/10.46229/elia.v2i2.513

Hoareau, L., & Tazouti, Y. (2024). Effect of teachers' acceptance of an educational app on students' early literacy and early numeracy skills. *Education and Information Technologies*, *29*(7), 8393–8414. https://doi.org/10.1007/s10639-023-12175-9

Hwang, J., & Ham, Y. (2021). Relationship between mathematical literacy and opportunity to learn with different types of mathematical tasks. *Journal on Mathematics Education*, *12*(2), 199–222.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative Research: A Guide to Design and Implementation*. John Wiley & Sons.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook*. Sage.

Nurmasari, L., Nurkamto, J., & Ramli, M. (2024). Realistic mathematics engineering for improving elementary school students' mathematical literacy. *Journal on Mathematics Education*, *15*(1), Article 26.

Patton, M. Q. (2014). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. Sage publications.

Purnasari, P. D., Saputro, T. V. D., & Sadewo, Y. D. (2023). Primary teacher working group assistance in the indonesia-malaysia border area to design the annual work program. *Dinamisia: Jurnal Pengabdian Kepada Masyarakat*, *7*(3), 636–643. https://doi.org/10.31849/dinamisia.v7i3.14519

Saputro, T. V. D., Purnasari, P. D., Lumbantobing, W. L., & Sadewo, Y. D. (2024). Augmented reality for mathematics learning: Could we implement it in elementary school? *Mosharafa: Jurnal Pendidikan Matematika*, *13*(1), 163–174. https://doi.org/10.31980/mosharafa.v13i1.1984

Sitopu, J. W., Khairani, M., Roza, M., Judijanto, L., & Aslan, A. (2024). The importance of integrating mathematical literacy in the primary education curriculum: A literature review. *International Journal of Teaching and Learning*, *2*(1), 121–134.

Sreylak, O., Sampouw, F., Saputro, T. V. D., & Lumbantobing, W. L. (2022). Mathematics concept in elementary school: A bibliometric analysis. *Journal of Educational Learning and Innovation (ELIa)*, *2*(2), 268–278. https://doi.org/10.46229/elia.v2i2.512

Supriati, R., Dewi, E. R., Supriyanti, D., & Azizah, N. (2022). Implementation framework for merdeka belajar kampus merdeka (MBKM) in higher education academic activities. *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, *3*(2), 150–161. https://doi.org/10.34306/itsdi.v3i2.555

Pertanika Proceedings 1 (2): 157 - 160 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

How do Students Conceptual Understand Using Augmented Reality Video Animation? An Empirical and Theoretical Overview

Wiku Aji Sugiri*, Sigit Priatmoko, Rizki Amelia, Agus Mukti Wibowo, Iin Nur Indah Rahmawati and Aristhalia Hevi Febrianti

Department of Teacher Education for Islamic Primary School, Faculty of Tarbiyah and Teacher Training, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Manlang 65144, Indonesia

ABSTRACT

Technology integration in education has become crucial in enhancing students' conceptual understanding, especially in abstract subjects such as science. Many schools, such as SDN 1 Bunulrejo, struggle to optimize available technological resources due to insufficient training and limited use of interactive media. Current teaching methods often rely heavily on traditional approaches like lectures and textbooks, which fail to provide students with a deep and engaging learning experience. This study investigates using Augmented Reality (AR) combined with video animation as a teaching tool to improve students' conceptual understanding, motivation, and engagement in learning science, specifically on the topic of "Plants and the Environment" to address this issue. The study employed AR-based animated video media to deliver instructional content using a quasi-experimental design with a pre-test and post-test on a sample of 36 fourth-grade students. The findings revealed a significant improvement in students' conceptual understanding and increased engagement after the implementation of AR media. This research contributes to developing innovative teaching methods in elementary education and offers practical insights into how AR and animation can enhance learning outcomes.

Keywords: Augmented reality, concept understanding, natural science

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.028

E-mail addresses:
wikusugiri@uin-malang.ac.id (Wiku Aji Sugiri)
sigitpriatmoko@uin-malang.ac.id (Sigit Priatmoko)
rizkiamelia@uin-malang.ac.id (Rizki Amelia)
mukti@pgmi.uin-malang.ac.id (Agus Mukti Wibowo)
iin.nrindhr10@gmail.com (Iin Nur Indah Rahmawati)
hevifebrianti155@gmail.com (Aristhalia Hevi Febrianti)
* Corresponding author

INTRODUCTION

Building a strong conceptual foundation in elementary science is essential for students' long-term academic growth. DiSessa (2014) emphasizes that students struggle to apply knowledge across subjects without a solid grasp of fundamental concepts. As Graulich and Schween (2018) notes, memorization

e-ISSN: 3083-9475

without understanding often limits comprehension; for example, students may perform arithmetic operations mechanically without understanding place values (Gilmore et al., 2018).

At SDN 1 Bunulrejo, teachers primarily use lectures, textbooks, and PowerPoint despite having access to technological resources such as computer labs, tablets, and Wi-Fi. With limited interactivity, this traditional approach constrains students' deeper learning experiences (Lindgren et al., 2016; Chen, 2020). Studies suggest that limited technology use in classrooms often results from teachers' lack of technical training (Ibáñez & Delgado-Kloos, 2018; Ramnarain, 2014).

Augmented Reality (AR) can address these gaps by vividly illustrating abstract scientific concepts. For instance, AR technology can help students better understand complex topics like photosynthesis and ecosystems, transforming abstract ideas into engaging, immersive experiences (Ibáñez & Delgado-Kloos, 2018; Weng et al., 2020).

PROBLEM STATEMENT

Building a strong foundation in elementary science is essential for students' academic growth, yet instructional methods at SDN 1 Bunulrejo remain largely traditional, relying on lectures, textbooks, and PowerPoint slides. Despite access to computer labs, tablets, and Wi-Fi, this approach limits deeper learning experiences. Studies indicate that limited technology use often results from insufficient teacher training, preventing effective integration of interactive resources. Consequently, students may struggle to understand and apply core concepts, impacting comprehension across subjects.

Augmented Reality (AR) has the potential to address these gaps by illustrating complex scientific ideas, such as photosynthesis, in engaging, immersive ways. By enhancing concept clarity and interactivity, AR could transform abstract ideas into accessible experiences, supporting students in developing a stronger scientific foundation for future academic success.

RESEARCH QUESTIONS

This study explores how Augmented Reality (AR) impacts elementary students' understanding and engagement with basic science concepts at SDN 1 Bunulrejo. Using a quasi-experimental pretest-posttest design, 36 fourth-grade students participated in an AR-based learning session on the theme "Plants as Life Sources." Initial assessments revealed that students skilled in technology use and inclined toward interactive learning scored an average of 55.083 on the pre-test. Post-AR session scores rose significantly to an average of 80.417, illustrating a substantial improvement in understanding plant concepts.

The AR session, featuring animated videos, engaged students through immersive 3D interactions that align with findings from Azuma et al. (2001) and Alzahrani (2020), who noted AR's motivational benefits. Student satisfaction reached 94.75%, reflecting

high engagement and observational data confirmed AR's positive role in fostering comprehension and motivation. The Wilcoxon Signed Rank Test revealed a statistically significant increase in scores ($p = 0.000 < 0.05$), supporting the hypothesis that AR effectively enhances conceptual understanding by visualizing complex ideas, reducing the cognitive load (Buchner et al., 2022), and making abstract concepts more accessible (Akçayır & Akçayır, 2017; Ibáñez & Delgado-Kloos, 2018).

Aligned with studies by Gargrish et al. (2022) and Tsai and Wang (2019), these results affirm AR's educational benefits in elementary settings, especially in enhancing conceptual understanding and engagement. However, further research is suggested to examine AR's impact across different subjects and its long-term influence on learning retention.

CONCLUSION

This study concludes that integrating Augmented Reality (AR) video animations into elementary science education significantly enhances students' conceptual understanding. The analysis showed a marked improvement in post-test scores, supporting the effectiveness of AR-based learning. Student engagement and motivation were notably high. While promising, the study acknowledges limitations such as unequal access to AR devices and adaptation challenges. Future research should address these issues and explore AR's potential in other subjects. Overall, AR technology offers a dynamic, interactive approach that improves comprehension, providing valuable insights for its application in elementary education.

IMPLICATION

These findings highlight the potential of AR video animation as an effective tool for teaching complex concepts, making learning more engaging and helping students understand the material better. They also suggest opportunities for further research on AR's application across different disciplines and the development of diverse, enriched learning materials.

ACKNOWLEDGEMENT

The authors express appreciation and gratitude to Lembaga Penelitian dan Pengabdian Kepada Masyarakat (LP2M), Universitas Islam Negeri Maulana Malik Ibrahim Malang Indonesia, which has supported the research. Best appreciation to all participants of this research.

REFERENCES

Akçayır, M., & Akçayır, G. (2017). Advantages and challenges associated with augmented reality for education: A systematic review of the literature. *Educational Research Review*, *20*, 1–11. https://doi.org/10.1016/j.edurev.2016.11.002

Alzahrani, N. M. (2020). Augmented reality: A systematic review of its benefits and challenges in e-learning contexts. *Applied Sciences*, *10*(16), Article 5660. https://doi.org/10.3390/app10165660

Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., & MacIntyre, B. (2001). Recent advances in augmented reality. *IEEE Computer Graphics and Applications*, *21*(6), 34–47. https://doi.org/10.1109/38.963459

Buchner, J., Buntins, K., & Kerres, M. (2022). The impact of augmented reality on cognitive load and performance: A systematic review. *Journal of Computer Assisted Learning*, *38*(1), 285–303. https://doi.org/10.1111/jcal.12617

Chen, C. H. (2020). AR videos as scaffolding to foster students' learning achievements and motivation in EFL learning. *British Journal of Educational Technology, 51*(3), 657-672. https://doi.org/10.1111/bjet.12902

diSessa, A. A. (2014). The construction of causal schemes: Learning mechanisms at the knowledge level. *Cognitive Science, 38*(5), 795-850. https://doi.org/10.1111/cogs.12131

Gargrish, S., Mantri, A., & Kaur, D. P. (2022). Evaluation of memory retention among students using augmented reality based geometry learning assistant. *Education and Information Technologies*, *27*(9), 12891–12912. https://doi.org/10.1007/s10639-022-11147-9

Gilmore, C., Gobel, S. M., & Inglis, M. (2018). *An Introduction to Mathematical Cognition*. Routledge. https://doi.org/10.4324/9781315684758

Graulich, N., & Schween, M. (2018). Concept-oriented task design: Making purposeful case comparisons in organic chemistry. *Journal of Chemical Education*, *95*(3), 376-383. https://doi.org/10.1021/acs.jchemed.7b00672

Ibáñez, M. B., & Delgado-Kloos, C. (2018). Augmented reality for STEM learning: A systematic review. *Computers & Education*, *123*, 109-123. https://doi.org/10.1016/j.compedu.2018.05.002

Lindgren, R., Tscholl, M., Wang, S., & Johnson, E. (2016). Enhancing learning and engagement through embodied interaction within a mixed reality simulation. *Computers & education*, *95*, 174-187. https://doi.org/10.1016/j.compedu.2016.01.001

Ramnarain, U. D. (2014). Teachers' perceptions of inquiry-based learning in urban, suburban, township and rural high schools: The context-specificity of science curriculum implementation in South Africa. In *Teaching and Teacher Education*, *38,* 65-75. https://doi.org/10.1016/j.tate.2013.11.003

Tsai, C. H., & Wang, C. P. (2019). An Analysis of the Development of Cultural Augmented Reality Education in Taiwanese Aboriginal Literature. *International Journal of e-Education, e-Business, e-Management and e-Learning*, *9*, 357–365.

Weng, C., Otanga, S., Christianto, S. M., & Chu, R. J. C. (2020b). Enhancing students' biology learning by using augmented reality as a learning supplement. *Journal of Educational Computing Research*, *58*(4), 747–770. https://doi.org/10.1177/0735633119884213

Pertanika Proceedings 1 (2): 161 - 166 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Preserving South Kalimantan Cultures and Supporting Creative Economy: Best Practices from a Kindergarten in Banjarmasin

Rizky Amelia[1]*, Yudha Adrian[2], Elisa Rosiana[3], Putriana Salman[1] and Salasiah[4]

[1]*Politeknik Negeri Banjarmasin, Accounting Department, 70123, Banjarmasin, Indonesia*
[2]*Universitas PGRI Kalimantan, Elementary School Teacher Education Study Program, 70122, Banjarmasin, Indonesia*
[3]*Akademi Maritim Nusantara Banjarmasin, English Lecturer,70236, Banjarmasin, Indonesia*
[4]*TK Aisyiyah Bustanul Athfal 42, 70125, Banjarmasin, Indonesia*

ABSTRACT

Merdeka's curriculum allows teachers to tailor learning experiences that align with students' interests, abilities, and learning styles. This research explores the realm of best practices in the Merdeka curriculum implementation in TK Aisyiyah Bustanul Athfal 42 Banjarmasin. This study identifies strategies and advantages for effective Merdeka curriculum development that covers local cultures, drawing on a comprehensive literature review and empirical case study. The researchers employed a qualitative approach using a case study design. As an instrument in this study, the researchers were present in the field to collect, process, and check the validity of the data obtained. An observation, documentation, and interview were conducted with the school principal and teachers to obtain the best practice with the STAR method. It is found that the learning in class is integrated with South Kalimantan cultures under the theme "Aku Cinta Budayaku," covering local cultures such as tanggui, sasirangan, and topi purun that are brought to class. The school principal, teachers, students, and parents are involved in the implementation. The learning has been implemented in the form of a project that students have run once a week for the whole semester since 2022. The students are actively involved in all activities. Integrating local cultures in classes aims to enhance educational quality, involve the preservation of the culture, and support the creative economy.

Keywords: Best practices, creative economy, kindergarten, preserving cultures

ARTICLE INFO

Article history:
Received: 12 December 2024
Published: 28 March 2025

DOI: https://doi.org/10.47836/pp.1.2.029

E-mail addresses:
rizky.amelia@poliban.ac.id (Rizky Amelia)
yudhaadrian@upk.ac.id (Yudha Adrian)
elroseel09@gmail.com (Elisa Rosiana)
putrianasalma@poliban.ac.id (Putriana Salman)
febry.lala.aura.arslan@gmail.com (Salasiah)
* Corresponding author

INTRODUCTION

RI Law Number 20 of 2003 emphasizes the connection between Indonesia's regional cultural values and the national education system, promoting the integration of Pancasila into kindergarten curriculums

e-ISSN: 3083-9475

(Darmadi, 2018; Irwahyudi et al., 2023). Cultural values are essential for national identity and should be taught early in life through education. Indonesia's younger generation is becoming more disconnected from their local culture due to outside influences (Akib et al., 2020; Alhosani, 2022; Haanurat, 2021; Hu & Ødemotland, 2021). Preserving local culture in education is crucial for cultural continuity and national pride (Aziz & Adnan, 2020; Kleemann, 2021; Kristianus, 2020; Surahman & Salmon, 2023).

Teachers had trouble covering all class content in the past, leading to less time for creative teaching methods (Chang et al., 2014; Perryman et al., 2024; Suparman et al., 2023). Insufficient training in culturally relevant pedagogy made tailoring the curriculum to Indonesia's diverse student population difficult. (Utami & Suswanto, 2022). Indonesia created the Merdeka Curriculum to shift focus from content to students' potential. It allows teachers more freedom to innovate, but success requires adequate training and resources (Rizki & Fahkrunisa, 2022; Utami & Suswanto, 2022)

Merdeka Curriculum promotes local culture integration, fostering student engagement and personal and cultural growth through active participation in learning (Siahaan, 2022). This integration allows students to appreciate their cultural identity and improve their academic skills. TK Aisyiyah Bustanul Athfal 42 Banjarmasin effectively implements the Merdeka Curriculum, integrating South Kalimantan culture through the "I Love My Culture" program, fostering cultural understanding and appreciation among students (Darma et al., 2019; Offorma, 2016; Yuda et al., 2022).

Cultural awareness significantly impacts the creative economy by enhancing market appeal, enriching outputs, and preserving cultural heritage for economic growth (Boccella & Salerno, 2016; Osses-vargas & Adams, 2022). It can also boost economic activity in communities through tourism and craft industries, transforming cultural heritage into a valuable asset for sustainable development (Boccella & Salerno, 2016b; Hu & Ødemotland, 2021; Nuraini, 2017; Osses-vargas & Adams, 2022).

PROBLEM STATEMENT

The flexibility of the Merdeka curriculum poses challenges in its implementation, especially in ensuring that it aligns with local cultural values while meeting educational goals. Despite the potential benefits, there is limited documentation on effective methods to incorporate local cultural elements such as tanggui, sasirangan, and topi purun into the curriculum. This study explores the best practices for integrating South Kalimantan culture into the Merdeka curriculum at TK Aisyiyah Bustanul Athfal 42, examining the role of teachers, students, and the community in this process.

To address this problem, the researchers employed a qualitative case study approach, which involves an in-depth exploration of the real-world implementation of the Merdeka curriculum. The data collected through observations, interviews, and documentation is

analyzed using thematic analysis. This technique allows the researchers to identify key patterns and recurring themes in the data, particularly regarding how the integration of local culture enhances students' learning experiences and their connection to their heritage. Through this method, the study aims to uncover the best practices in curriculum implementation and the role of local cultural content in shaping educational outcomes.

RESEARCH QUESTIONS

How does the integration of South Kalimantan's local cultures through project-based learning enhance educational quality and contribute to cultural preservation and the local creative economy? The STAR method was utilized in a study on the "I Love My Culture" program at Aisyiyah Bustanul Athfal 42 Banjarmasin, focusing on cultural preservation and creative economy initiatives. The "I Love My Culture" program at TK Aisyiyah Bustanul Athfal 42 Banjarmasin faces funding and fine motor skill challenges. Cooperation between teachers and parents is crucial for funding and individual attention, involving discussions, understanding, and planning. The next stage is Peer teachers collaborating with students to plan learning plans, collaborate with parents to involve them and implement the "I Love My Culture" intracurricular program, integrating cultural aspects into everyday learning in Figure 1.

The last step in the process is reflection, which is crucial. Teachers collaborate on effective teaching methods, lesson planning, and instructional strategies, fostering a culture of TK Aisyiyah Bustanul Athfal 42 Banjarmasin hosts guest speakers, including local experts, artists, and storytellers, to share knowledge about South Kalimantan's culture, history, and values. Traditional arts and crafts are incorporated into the curriculum, nurturing creativity and reinforcing cultural identity among young students (Akib et al., 2020; Astari, 2023).

However, the number of *Tanggui* makers is gradually decreasing. Similarly, *Tanggui* is rarely accessible for purchase on the outskirts of Banjarmasin. Only a few artists are presently engaged in the production of this traditional Banjar headgear. It affects the economics of the region as well. Sariyah (50 yo), for example, in the Tribunnews article, is the one who truly relies on money from *tanggui* due to the husband's inability to work as a

Figure 1. Activities of teachers and students collaborated in carrying out to celebrate culture

result of a stroke. She currently lives in poverty because the sale of tanggui has decreased (Banjarmasin tribunnews.com). The existence of tanggui would really help her and her family to survive.

Researchers discovered that a kindergarten in Banjarmasin successfully preserves South Kalimantan cultures and supports the creative economy by combining local culture with learning (Tohri et al., 2022; Utami & Suswanto, 2022). Tanggui is a large woven handicraft made from nipa palm leaves used as protection from rain and sun (Widyanti et al., 2022). The production center is in Banjarmasin, specifically Alalak Selatan Village (Yang & Li, 2022). School principal designates tanggui as a best practice to integrate culture into learning aids, increasing student interest and supporting tanggui makers' creative economy (Boccella & Salerno, 2016; Yuda et al., 2022).

The kindergarten teaches children traditional knowledge, values, and practices to build a strong cultural identity (Boccella & Salerno, 2016; Widyanti et al., 2022). It helps children develop pride in their culture and skills to creatively engage with their heritage. It leads to the emergence of creative entrepreneurs who use their cultural roots for innovation (Akib et al., 2020; Utami & Suswanto, 2022). It preserves cultural heritage and boosts the local creative economy's diversification and sustainability.

CONCLUSION

The study highlights the importance of integrating cultural heritage into education for economic growth and identity preservation, highlighting successful strategies for policymakers, educators, and cultural keepers. While this study offers valuable insights into implementing the Merdeka curriculum at TK Aisyiyah Bustanul Athfal 42 Banjarmasin, several limitations exist. First, the research is based on a single case study, so the findings may not easily apply to other schools or regions. The local cultures of South Kalimantan, such as tanggui, sasirangan, and topi purun, are deeply rooted in the area, so the approach to integrating these traditions might differ in other parts of Indonesia or beyond. Second, this study relies on qualitative data, including interviews, observations, and document analysis. While these methods provide rich and detailed information, they also reflect the perspectives of a small group of participants—namely, the school principal, teachers, students, and parents. This means the findings might be influenced by the personal views and experiences of those directly involved in the study. Additionally, the researchers conducted the data collection themselves, which could have introduced some bias in how information was gathered and interpreted.

ACKNOWLEDGEMENT

The authors thank Politeknik Negeri Banjarmasin and TK Aisyiyah Bustanul Athfal 42, Banjarmasin, Indonesia, for their support in conducting this research study.

REFERENCES

Akib, E., Imran, M. E., Mahtari, S., Mahmud, M. R., Prawiyogy, A. G., Supriatna, I., & Ikhsan, M. H. (2020). Study on implementation of integrated curriculum in Indonesia. *IJORER: International Journal of Recent Educational Research*, *1*(1), 39-57. https://doi.org/10.46245/ijorer.v1i1.24

Alhosani, N. (2022). The influence of culture on early childhood education curriculum in the UAE. *ECNU Review of Education*, *5*(2), 284-298. https://doi.org/10.1177/20965311221085984

Astari, S. (2023). International review of humanities studies Betawi cultural village as young generation. *International Review of Humanities Studies, 8*(2), Article 16. https://doi.org/10.7454/irhs.v8i2.1122

Aziz, I., & Adnan, N. A. A. (2020). Preserving Culture in Strengthening Students' Characters. In *1st Progress in Social Science, Humanities and Education Research Symposium (PSSHERS 2019)* (pp. 235-237). Atlantis Press. https://doi.org/10.2991/assehr.k.200824.055

Boccella, N., & Salerno, I. (2016). Creative economy, cultural industries and local development. *Procedia-Social and Behavioral Sciences*, *223*, 291-296. https://doi.org/10.1016/j.sbspro.2016.05.370

Chang, M. C., Shaeffer, S., Al-Samarrai, S., Ragatz, A. B., Ree, J. D., & Stevenson, R. (2014). *Teacher reform in Indonesia: The role of politics and evidence in policy making human development*. The World Bank.

Darma, I. K., Ningsih, N. L. A. P., & Pertamawati, N. P. (2019). Exploring the competitive advantage of local creative industry in Bali, Indonesia. *Journal of Advanced Research in Dynamical and Control Systems, 11*(12 Special Issue), 688–696. https://doi.org/10.5373/JARDCS/V11SP12/20193266

Darmadi, H. (2018). Educational management based on local wisdom (Descriptive analytical studies of culture of local wisdom in West Kalimantan*). JETL (Journal Of Education, Teaching and Learning), 3*(1), Article 135. https://doi.org/10.26737/jetl.v3i1.603

Haanurat, A. I. (2021). *Society 5.0 Leading in the Borderless World*. Bildung Pustaka Utama.

Hu, A., & Ødemotland, S. (2021). Fostering cultural sustainability in early childhood education through a neighbourhood project. *Sustainability*, *13*(9), Article 5203. https://doi.org/10.3390/su13095203

Irwahyudi, W., Khoiri, A., & Kusumaningrum, S. R. (2023). Implementation of the independent curriculum in mover schools (A case study at Upt Sd Negeri Kedungbanteng 02 Bakung District Blitar Regency). *Autentik: Jurnal Pengembangan Pendidikan Dasar, 7*(2), 118–127.

Kleemann, C. (2021). Pedagogical translanguaging to create sustainable minority language practices in kindergarten. *Sustainability, 13*(7), Article 3613. https://doi.org/10.3390/su13073613

Kristianus, K. (2020). Implementation of senior high school multicultural education curriculum in West Kalimantan. *International Journal of Education & Curriculum Application, 3*(2), 121–129. https://doi.org/10.31764/ijeca.v3i2.2688

Offorma, G. C. (2016). Integrating components of culture in curriculum planning. *International Journal of Curriculum and Instruction*, *8*(1), 1-8.

Osses-vargas, A., & Adams, R. J. (2022, October 13-15). *Relationship between students' economic, cultural, and social status, school climate and student achievement in Indonesia*. [Paper presentation]. ICAL, Bali, Indonesia.

Perryman, J., Leaton Gray, S., Hargreaves, E., & Saville, K. (2024). Feeling Overwhelmed: Pedagogy and professionalism in a pandemic. *Pedagogy, Culture & Society*, *32*(3), 795-814. https://doi.org/10.1080/14681366.2022.2133157

Rizki, R. A., & Fahkrunisa, L. (2022). Evaluation of Implementation of Independent Curriculum. *Journal of Curriculum and Pedagogic Studies (JCPS), 1*(4), 32–41. https://doi.org/10.30631/jcps.v1i1.1383

Siahaan, F. (2022). The critical period hypothesis of second language acquisition theory of Eric Lenneberg's. *The Explora*, *8*(2), 28-34. https://doi.org/10.51622/explora.v8i2.643

Suparman, A., Kusnadi, S., & Adiredja, R. (2023). The flipped classroom: A story from an EFL classroom in Indonesia. *Mextesol Journal*, *47*(2), Article n2.

Surahman, B., & Salmon, I. P. P. (2023). School culture and the quality of learning: The experience in Special Region of Yogyakarta. *International Journal of Evaluation and Research in Education, 12*(2), 692–702. https://doi.org/10.11591/ijere.v12i2.23140

Tohri, A., Rasyad, A., Sururuddin, M., & Istiqlal, L. M. (2022). The urgency of Sasak local wisdom-based character education for elementary school in East Lombok, Indonesia. *International Journal of Evaluation and Research in Education, 11*(1), 333–344. https://doi.org/10.11591/ijere.v11i1.21869

Utami, Y. P., & Suswanto, B. (2022). The educational curriculum reform in Indonesia: supporting "Independent learning independent campus (MBKM)". *SHS Web of Conferences, 149*, Article 01041. https://doi.org/10.1051/shsconf/202214901041

Widyanti, T., Tetep, T., Supriatna, A., & Nurgania, S. (2022, July). Development of a local wisdom-based creative economy. In *6th Global Conference on Business, Management, and Entrepreneurship (GCBME 2021)* (pp. 38-41). Atlantis Press. https://doi.org/10.2991/aebmr.k.220701.010

Yang, W., & Li, H. (2022). The role of culture in early childhood curriculum development: A case study of curriculum innovations in Hong Kong kindergartens. *Contemporary Issues in Early Childhood, 23*(1), 48–67. https://doi.org/10.1177/1463949119900359

Yuda, R., Ansori, M., & Faruqi, U. S. Al. (2022). Exploring the role of culture and digital capital in establishing community resilience through creative economy in Indonesia. *Indonesia Post-Pandemic Outlook: Rethinking Health and Economics Post-COVID-19, 19*, 185–208. https://doi.org/10.55981/brin.537.c525

REFEREES
FOR THE
PERTANIKA PROCEEDINGS

Vol. 1 (2) 2025

The Editorial Board of the Pertanika Proceedings wishes to thank the following:

Yusuf Hanafi
UM, Indonesia

Hadi Suwono
UM, Indonesia

Siti Zubaidah
UM, Indonesia

Abd. Qohar
UM, Indonesia

Dedi Kuswandi
UM, Indonesia

I Nengah Parta
UM, Indonesia

Nunung Suryati
UM, Indonesia

Anang Santoso
UM, Indonesia

Cholis Sa`dijah
UM, Indonesia

Eddy Sutadji
UM, Indonesia

Surjani Wonorahardjo
UM, Indonesia

H. Punaji Setyosari
UM, Indonesia

Subanji
UM, Indonesia

Sri Untari
UM, Indonesia

Susiswo
UM, Indonesia

I Wayan Dasna
UM, Indonesia

Toto Nusantara
UM, Indonesia

Santi Irawati
UM, Indonesia

Nurul Murtadho
UM, Indonesia

UM – Universitas Negeri Malang

While every effort has been made to include a complete list of referees for the period stated above, however if any name(s) have been omitted unintentionally or spelt incorrectly, please notify the Chief Executive Editor, *Pertanika* Journals at executive_editor.pertanika@upm.edu.my

Any inclusion or exclusion of name(s) on this page does not commit the *Pertanika* Editorial Office, nor the UPM Press or the university to provide any liability for whatsoever reason.

Pertanika Proceedings
Vol. 1 (2) 2025

Content

Pertanika Editorial Office, Journal Division,
Putra Science Park,
1st Floor, IDEA Tower II,
UPM-MTDC Center,
Universiti Putra Malaysia,
43400 UPM Serdang,
Selangor Darul Ehsan
Malaysia

http://www.pertanika.upm.edu.my
Email: executive_editor.pertanika@upm.edu.my
Tel. No.: +603- 9769 1622

PENERBIT UPM
UNIVERSITI PUTRA MALAYSIA
PRESS

http://penerbit.upm.edu.my
Email: dir.penerbit@upm.edu.my
Tel. No.: +603- 9769 8855

eISSN 3083-9475