



Polyhedron International Journal in Mathematics Education

Publication details, including instructions for authors and subscription information:
<https://nakiscience.com/index.php/pijme>



Polyhedron International Journal in Mathematics Education



The effect of photomath applications on mathematical problem solving: systematic literature review

Sri Yayuk Juana Putri^{a*}, Cahyanti^b

^{a*}Universitas Nahdlatul Wathan
Mataram, West Nusa Tenggara,
Indonesia,

sriyayukjuanaputri@gmail.com

^bUniversitas Nahdlatul Wathan Mataram,
West Nusa Tenggara, Indonesia,
cahy389@gmail.com

To cite this article:

Putri, S.Y, J & Cahyanti. (2024). The effect of photomath applications on mathematical problem solving: systematic literature review. *Polyhedron International Journal in Mathematics Education*, 2(2), 64-68.

To link to this article:

<https://nakiscience.com/index.php/pijme>

Published by:

Nasir Al-Kutub Indonesia

Residential Street Kila Rengganis, Block I, Number 11, Labuapi, Indonesia, 83361

The effect of photomath applications on mathematical problem solving: systematic literature review

Sri Yayuk Juana Putri^{a*}, Cahyanti^b

^{a*}Universitas Nahdlatul Wathan Mataram, West Nusa Tenggara, Indonesia, sriyayukjuanaputri@gmail.com

^bUniversitas Nahdlatul Wathan Mataram, West Nusa Tenggara, Indonesia, cahy389@gmail.com

*Correspondence: sriyayukjuanaputri@gmail.com

Abstract

The purpose of this research was to analyze the impact of the Photomath application on students' mathematical problem-solving abilities. This study employed a systematic literature review method using the PRISMA approach, where relevant articles were collected and analyzed following the PRISMA flowchart. There were 5 articles that were further analyzed. The results revealed various research methodologies used in studies involving Photomath, publication trends in recent years, and evidence of its influence on enhancing students' problem-solving skills. Based on these findings, it was recommended that teachers integrate the Photomath application as a supplementary tool in mathematics learning to help students understand and solve complex mathematical problems effectively.

Article History

Received:

24 July 2024

Revised:

20 October 2024

Accepted:

12 November 2024

Published Online:

30 November 2024

Keywords:

Problem-solving;

Photomath;

Systematic literature review

1. Introduction

The world of education is a means to advance and develop potential knowledge and skills in human life. As time goes by and the rapidly developing world of technology provides its own challenges for every educator in providing teaching to students (Fatihah et al., 2023; Sudirman et al., 2024; Kuswara et al., 2024; Isnawa & Elsulami, 2024). The development of technology is a big influence on the world of education, so many people use technology as a learning medium with the aim of making it easier for students to learn and solve problems related to difficult questions, especially in solving mathematics problems. Education actors use technological developments as a learning medium and achieve educational goals in accordance with the demands of the times (Abida & Kusuma, 2019; Sudirman et al., 2022). The use of technology as a learning medium by students is the use of the photomath application which can help them to complete the tasks given by the teacher. Photomath is an application that uses a smartphone camera to find answers to mathematical questions that can be used easily, namely by opening the application, pointing the camera at the problem, taking a photo, then Photomath immediately provides detailed solution instructions without requiring complex input from the user (Dewi & Handayani, 2022).

Based on this description, researchers are interested in studying the effect of the photomath application on mathematical problems. The method used is systematic literary review because this method can be used in various fields of science, one of which is the influence of the photomath application on solving mathematical problems. Apart from that, it is still said that this type of research has not been carried out by many other researchers. Oktaviani (2022), using qualitative research methods with a descriptive approach, in research on the use of the photomath application as a medium for solving mathematical problems. Oktaviani said that the use of this application really helps users in solving mathematical problems that are considered difficult to solve manually, especially for users who don't really understand mathematics. Ahmad Rabiul

Muzammil (2023), used qualitative methods, in researching undergraduate students' perceptions of the use of photomaths in solving mathematical problems. Muzammil revealed that photomath can accurately and effectively produce solutions to mathematical problems. Sibuea (2022) uses quantitative

methods with an engineering approach, in utilizing the photomath application as a medium for learning mathematics. Sibuea revealed that providing training to students on how to use mathematics applications downloaded via cellphone or Android, in this case the photomath application, can help students understand mathematics learning material.

From the description above, the researcher took several questions to achieve the research objectives. Some research questions are outlined below:

- (1). What research methods are used in these articles?
- (2). What year was the article published?
- (3). How does using the photomath application affect math solving?

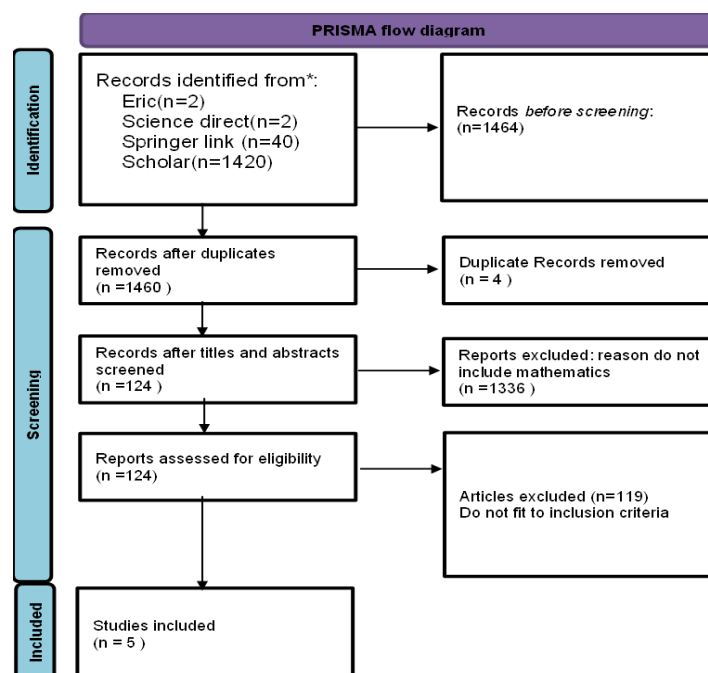
2. Method

This research was a literature study using the Systematic Review (SR) method, commonly known as Systematic Literature Review (SLR), a structured technique for collecting, integrating, and compiling findings from various studies on specific research questions or topics. The SLR method was selected because it could be applied across different fields of science, whether pure or applied. To facilitate the assessment of systematic reviews or meta-analyses, the researcher adopted the PRISMA approach, which assists in compiling high-quality systematic reviews and meta-analyses. PRISMA consists of a checklist that guides authors on items that must be included and explained thoroughly in a systematic review. The steps in PRISMA followed in this research were identification, scanning, eligibility, and inclusion.

The first stage was identification, involving the search for and collection of data. The researcher used the keyword "Photomath" across several websites, including ERIC, ScienceDirect, SpringerLink, and Google Scholar. The search yielded 2 articles from ERIC, 2 from ScienceDirect, 40 from SpringerLink, and 1,420 from Google Scholar, resulting in a total of 1,464 articles. The next step was scanning, where duplicate articles were identified and removed. Four duplicate articles were eliminated, leaving 1,460 articles. These articles were then subjected to the eligibility stage, where titles and abstracts unrelated to mathematics were excluded. A total of 1,336 articles were eliminated at this stage, leaving 124 articles. Finally, the inclusion stage involved selecting articles that met the researcher's criteria. Five articles were selected as the basis for answering the research questions and objectives. A detailed depiction of the process can be seen in the diagram below.

Figure 1

PRISMA procedure



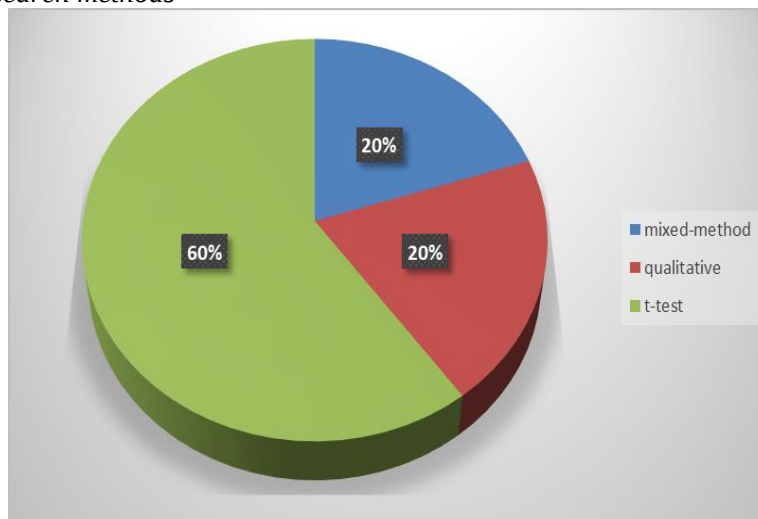
3. Results and Discussion

3.1. What research methods are used in these articles?

Based on the results of the analysis of 5 articles, information was obtained that some used qualitative methods, mixed methods and t-test methods. based on analysis of journals using mixed methods, there are 20%, namely 1 article. The second method is the qualitative method, there are 20% of articles using this method, namely 1 article, the next method is the t-test, which is 60% or the same as 3 articles. To make it clearer, you can see the explanation in the image below.

Figure 2

Distribution of research methods



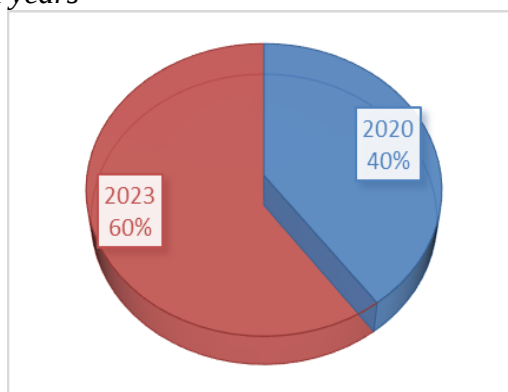
From the results above, we can see that the use of the t-test method is the most. The t-test is often used in scientific research to test the hypotheses that have been proposed. For example, researchers might use the t-test to test whether there is a significant difference in the level of learning success between groups using the photomath application or groups that are still learning manually. The t-test is an inferential statistic used to determine whether there is a statistically significant difference between the means of two variables (Adam Hayes, 2024).

3.2. In what years were the journals published?

Based on the results of the data analysis, the journals published in 2020 were 40% or 2 articles, namely Raymund., 2020 and Kartigeyan., 2020. While the articles published in 2023 were 60% or 3 articles, namely Aulia., 2023, Ardiana., 2023, and Iffah., 2023. The explanation can be seen in the picture below.

Figure 3

Distribution of publication years



After seeing the results of data analysis, research on photomath applications continues to increase over time and as times become more sophisticated. Increasingly, there are more and more users of the photomath application because now everything is digital. So, photomath is an interesting application for learning mathematics in the era of digital literacy, which can read and solve problems ranging from arithmetic to calculus instantly using the camera on a mobile device (Dewi & Handayani, 2022).

3.3. How does using the photomath application affect math solving?

Based on the results of data analysis, using the Photomath application is very useful in solving mathematical problems. Because all of the five articles studied stated that the photomath application had an influence on mathematical problems. The fact that there are also many journals and articles that have been published about the use of this Photomath application, although in various syntaxes and their respective applications, can be seen from the Google Scholar database which the author has carried out in the period 2018-now. It can be said that the photomath application can be used by students as a tool in learning, making it easier for students to work on problems and having the function of solving mathematics problems by taking photos (Nur & Yahfizham, 2024). Photomath is an Android application that can help solve various math problems that you face, whether at school or college (Abida & Kusuma, 2019)

4. Conclusion

Based on the results of research and discussions, several findings were obtained. First, the method that examines the influence of the photomath application on 5 articles obtained information that some used qualitative methods, mixed methods and t-test methods. based on analysis of journals using mixed methods, there are 20%, namely 1 article. The second method is the qualitative method, there are 20% of articles that use this method, namely 1 article, the next method is the t-test, which is 60% or the same as 3 articles. Second, based on the results of data analysis, there were 40% of journals published in 2020 or 2 articles, the articles were Raymund., 2020 and Kartigeyan., 2020. Meanwhile the article published in 2023 there are 60% or 3 articles, the articles are Aulia., 2023, Ardiana., 2023, and Iffah., 2023. And the last one is research on the influence of the photomath application. Based on the results of data analysis, using the Photomath application is very useful in solving mathematical problems. Because all of the five articles studied stated that the photomath application had an influence on mathematical problems

Acknowledgments

The author would like to thank the following people who have assisted with this research project, friends who are willing to be bothered if there are difficulties in carrying out the work and thanks to the group team who always work together in the process of completing this assignment.

Declarations

Author Contribution: Author 1: determined the concept, processed data using the prism diagram method, compiled and wrote the research; Author 2: editing data from Indonesian to English; Author 3: mentor who always provides direction and teaches how to carry out research properly and correctly.

Funding Statement:

There was no funding assistance for this research.

5. References

- Abida, R., & Kusuma, AB. (2019). Penggunaan mobile learning pada pelajaran matematika di era revolusi industri 4.0, 5(1) <https://eproceedings.umpwr.ac.id/index.php/sendika/article/view/716>
- Dewi, IWDP., & Handayani, IGAH. (2022). Peran Aplikasi Fotomatis Dalam Pembelajaran Matematika Di Era Literasi Digital, 20(1) <https://ojs.ikip-saraswati.ac.id/index.php/suluh-pendidikan/article/view/411>

- Fatihah, J. J., Sudirman, S., & Mellawaty, M. (2023). Improving geometric thinking skills through learning cycles assisted by interactive geometry books. *International Journal of Mathematics and Sciences Education*, 1(2), 81-85. <https://doi.org/10.59965/ijmsed.v1i2.74>
- Hayes, A. (2024). Q-Test: Apa Saja Rumusnya dan Kapan Menggunakannya. Diakses pada 19 Juli 2024, dari <https://www.investopedia.com/terms/t/t-test.asp>
- Isnawan, M. G., & Alsulami, N. M. (2024). Didactical design for online learning in ordering fractions. *International Journal of Didactic Mathematics in Distance Education*, 1(1), 1-12. <https://doi.org/10.33830/ijdmde.v1i1.7653>
- Kuswara, R. D., Almazroei, E. E., & Isnawan, M. G. (2024). Online didactical design for subtraction fractions: A didactical design research through lesson study activities. *International Journal of Didactic Mathematics in Distance Education*, 1(1), 37-46. <https://doi.org/10.33830/ijdmde.v1i1.7772>
- Muzammil, AR., Mariadi., Asfar, DA., Shidqi, MZ., Astama, RAE., Muhammad, RD., & Mahadi, CA. (2023). Persepsi Mahasiswa Sarjana Terhadap Penggunaan Photomath dalam Menyelesaikan Masalah Matematika. *Jurnal Pendidikan*, 12(4) <https://ssed.or.id/contents/article/download/285/212/>
- Oktaviani, RD., Ilmiah, T., Sholihah, N., Apriliyani, R., & Fauzi, I. (2022). Pemanfaatan aplikasi photomath sebagai media penyelesaian masalah matematika. *Jurnal Pendidikan Matematika*, 4(1), 40-54 <https://jurnal.unimor.ac.id/JPM/article/download/2539/976>
- Nasution, N.E., & Yahfizham. (2024). Pemanfaatan Aplikasi Photomath Dalam Pembelajaran Matematika. 2(2), 50-56. <https://journal.widyakara.ac.id/index.php/konstanta-widyakarya/article/download/3106/2865/12127>
- Sibuea, MFL., Sembiring, MA., Lubis, I.A., & Agus, RTA. (2022). Pemanfaatan Aplikasi Fotomatis Sebagai Media Pembelajaran Matematika. *Jurnal Pemberdayaan Sosial dan Teknologi Masyarakat*, 2(1), 109-115 <https://jurnal.goretanpena.com/index.php/JPSTM/article/download/962/771>
- Sudirman, S., Kusumah, Y. S., & Martadiputra, B. A. P. (2023, October). Evaluation design for 3D geometry learning using augmented reality. In *AIP Conference Proceedings* (Vol. 2734, No. 1). AIP Publishing.
- Sudirman, S., Kusumah, Y. S., & Martadiputra, B. A. P. (2022). The Impact of 3D Geometry Assisted 6E Instructional Model to Improve 3D Geometry Thinking Skills of Junior High School Students. *Jurnal Pendidikan MIPA*, 23(1), 45-56.