



Systematic literature review: Utilization of the ProProfs Brain Games Website to improve student learning outcomes

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Abstract

Advancements in educational technology have encouraged the utilization of interactive digital learning media, one of which is the ProProfs Brain Games platform. This study aims to analyze the utilization and effectiveness of ProProfs Brain Games in improving student learning outcomes through a Systematic Literature Review (SLR) approach. A total of 11 scholarly articles published between 2020 and 2025 were analyzed using the SLR method, drawing on data sources from Google Scholar and Publish or Perish, based on predefined inclusion and exclusion criteria. The synthesis results indicate that the use of ProProfs Brain Games consistently contributes positively to the improvement of learning outcomes, student motivation, active engagement, and conceptual understanding across various educational levels and subject areas. This platform effectively supports game-based learning through interactive features such as quizzes, crossword puzzles, and online assessments. Theoretically, these findings reinforce the concept of game-based learning and the integration of digital technology as a student-centered instructional strategy. Practically, the results imply the importance of integrating interactive digital media such as ProProfs Brain Games in the implementation of the Merdeka Curriculum to create more meaningful, adaptive, and learner-oriented learning experiences in the digital era.

Keyword: proprofs brain games; learning outcome; game-based learning; systematic literature review

Abstrak. Kemajuan teknologi pendidikan mendorong pemanfaatan media pembelajaran digital yang interaktif, salah satunya melalui platform ProProfs Brain Games. Penelitian ini bertujuan untuk menganalisis pemanfaatan dan efektivitas ProProfs Brain Games dalam meningkatkan hasil belajar peserta didik melalui pendekatan Systematic Literature Review (SLR). Sebanyak 11 artikel ilmiah yang diterbitkan pada periode 2020–2025 dianalisis menggunakan metode SLR dengan basis data Google Scholar dan Publish or Perish, berdasarkan kriteria inklusi dan eksklusi yang telah ditetapkan. Hasil sintesis menunjukkan bahwa penggunaan ProProfs Brain Games secara konsisten berkontribusi positif terhadap peningkatan hasil belajar, motivasi, keterlibatan aktif, serta pemahaman konseptual peserta didik pada berbagai jenjang dan mata pelajaran. Media ini efektif mendukung pembelajaran berbasis permainan (game-based learning) melalui fitur interaktif seperti kuis, teka-teki silang, dan evaluasi daring. Secara teoretis, temuan penelitian ini memperkuat konsep game-based learning dan pemanfaatan teknologi digital sebagai strategi pembelajaran yang berpusat pada peserta didik. Secara praktis, hasil penelitian ini berimplikasi pada pentingnya integrasi media digital interaktif seperti ProProfs Brain Games dalam implementasi Kurikulum Merdeka untuk menciptakan pembelajaran yang lebih bermakna, adaptif, dan sesuai dengan karakteristik peserta didik di era digital.

INTRODUCTION

The rapid development of digital technology has significantly transformed educational practices, particularly in the design and implementation of learning media. Digital-based learning environments enable interactive, flexible, and student-centered learning experiences aligned with the demands of 21st-century education. In this context, learners are expected not only to acquire knowledge but also to develop critical thinking, creativity, collaboration, and digital literacy skills. Effective integration of technology in education has been shown to enhance student engagement, motivation, and learning outcomes when supported by appropriate pedagogical strategies (Mayer, 2020; Deterding et al., 2019). Well-designed digital learning media also facilitate multimodal content delivery, immediate feedback, and meaningful learning experiences that promote deeper understanding.

One instructional approach that has gained increasing attention is game-based learning, which is grounded in constructivist learning theory and engagement theory. Game-based learning encourages active knowledge construction through meaningful interaction, problem-solving, and immediate feedback, thereby fostering deeper conceptual understanding and sustained learner engagement (Piaget, 1972; Kapp, 2012; Fredricks et al., 2004). In digital contexts, educational games support self-regulated learning by allowing learners to explore content at their own pace while maintaining motivation. Empirical studies indicate that game-based learning positively influences cognitive, affective, and behavioral learning outcomes, particularly when integrated with sound instructional design (Hamari et al., 2016).

Various digital platforms have been utilized to support game-based learning, including Kahoot, Quizizz, Wordwall, and ProProfs Brain Games. While Kahoot and Quizizz emphasize competitive, real-time quizzes and Wordwall focuses on template-based reinforcement activities, ProProfs Brain Games offers more flexible features such as customizable quizzes, crossword puzzles, surveys, flashcards, and formative assessments. These features enable educators to design learning activities that emphasize not only competition but also reflection, problem-solving, and independent learning, making ProProfs suitable for diverse educational contexts and learning objectives.

Several empirical studies have reported positive effects of ProProfs Brain Games on student learning outcomes, motivation, and engagement across various subjects and educational levels (Irawati & Al Ayubi, 2024; Azzahra et al., 2025; Elvira et al., 2024). However, these studies remain context-specific, employ diverse methodologies, and report findings that have not been systematically synthesized. Consequently, a comprehensive understanding of the effectiveness and pedagogical implications of ProProfs Brain Games compared to other digital learning media is still limited.

This condition indicates a research gap, namely the absence of a systematic literature review (SLR) that critically synthesizes existing studies on the utilization of ProProfs Brain Games in improving student learning outcomes. Therefore, this study aims to analyze the utilization and effectiveness of ProProfs Brain Games through an SLR approach. The findings are expected to contribute theoretically to the discourse on game-based learning and digital pedagogy, and practically to provide evidence-based insights for educators and policymakers in integrating interactive digital media within contemporary, learner-centered educational frameworks.

RESEARCH METHODS

This study employed a Systematic Literature Review (SLR) approach to analyze the utilization and effectiveness of the ProProfs Brain Games platform in improving student learning outcomes. The SLR method was chosen because it enables a structured, transparent, and replicable process for identifying, evaluating, and synthesizing relevant research findings (Triandini et al., 2019). In this study, the SLR method was utilized to examine the use of the ProProfs Brain Games website in enhancing student learning outcomes. The implementation of the SLR method in this research includes several stages (see Figure 1), which are described as follows:

1) Research Question

The research questions were formulated based on the central theme of the study. These questions are designed to guide the investigation and define the scope of analysis. The research questions in this study are as follows:

Q1: How is the ProProfs Brain Games website utilized in learning to improve students' academic achievement?

Q2: Can the ProProfs Brain Games website enhance students' academic achievement?

2) Search Process

The literature search was conducted using Google Scholar and Publish or Perish as the primary databases. These databases were selected due to their wide coverage of peer-reviewed national and international academic publications. The search process was carried out using combinations of keywords such as "ProProfs Brain Games," "game-based learning," "learning outcomes," and "digital learning media." Boolean operators (AND, OR) were applied to refine the search results and ensure the relevance of retrieved articles. The search was limited to articles published between 2020 and 2025 to ensure the inclusion of recent and relevant studies related to digital and game-based learning.

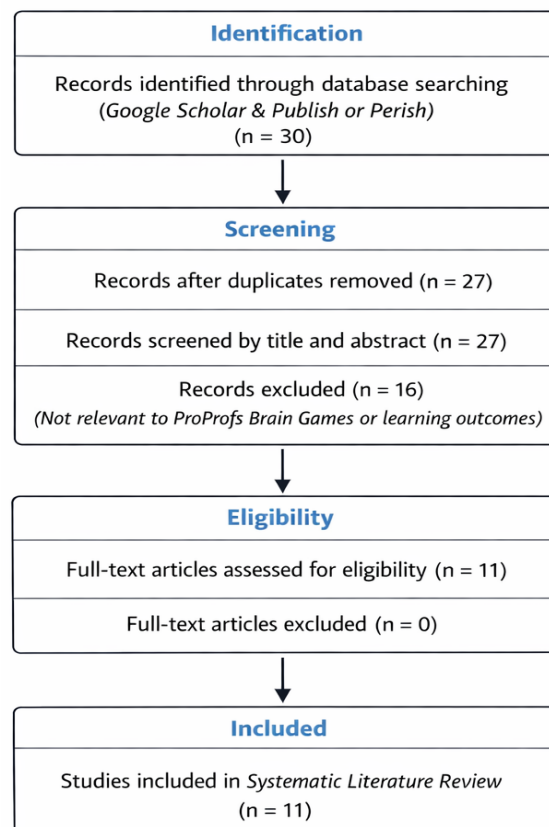


Figure 1 PRISMA flow diagram of the study selection process

3) Inclusion Criteria

Articles were included in the review if they met the following criteria:

- Published in peer-reviewed journals indexed in Google Scholar or accessible via Publish or Perish.
- Published between 2020 and 2025.
- Focused on the utilization of ProProfs Brain Games as a learning or evaluation medium.
- Reported empirical findings related to student learning outcomes, motivation, engagement, or learning effectiveness.

The article selection process in this study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency and rigor in the identification, screening, and inclusion of relevant studies.

4) Quality Assessment (QA)

All selected articles were evaluated using a Quality Assessment (QA) procedure to ensure methodological rigor and relevance to the research questions. The following assessment criteria were applied:

QA1: Does the article clearly explain how ProProfs Brain Games is utilized in the learning process?

QA2: Does the article report evidence of the impact of ProProfs Brain Games on student learning outcomes?

Only articles that met both quality assessment criteria were included in the final synthesis. Based on this process, 11 articles were identified as eligible for in-depth analysis.

RESULTS AND DISCUSSION

From the results of the screening using Inclusion Criteria in the initial stage through the Google Scholar database, 30 articles were obtained. Furthermore, a selection was carried out to obtain 27 articles published in 2020-2025 according to the research topic. Then from the final results, 11 articles were obtained that were suitable and could be continued to the next stage (see Table 1), namely Quality Assessment (QA).

Table 1 Result Quality Assessment

No.	Title & authors	Research method & sample	Research findings
1.	<i>The Influence of ProProfs Media on the Mathematics Learning Outcomes of Junior High School Students</i> Ayub, Tri Novita Irawati, Sholahudin Al Ayubi (2024)	Quasi-experimental research with a quantitative approach involving students of Grade VII-A and VII-B at SMP 01 Islam Jember (2023/2024 academic year).	The Wilcoxon non-parametric test yielded a significance value < 0.05 , indicating a statistically significant effect. Thus, the use of ProProfs media positively influenced students' mathematics learning outcomes.
2.	<i>Implementation of ProProfs as a Game-Based Learning Media to Improve Mathematics Learning Outcomes of Grade V Students at MI</i> Salsabila Novri Azzahra, Kukuh Mulana Al Fatha, Ulfah Umorohmi (2025)	Qualitative research with a descriptive approach; subjects were Grade V students of MI Yasmida Ambarawa.	The use of ProProfs increased students' motivation, engagement, and understanding of mathematical concepts. Its interactive and gamified features contributed to a fun and independent learning experience, leading to improved outcomes.
3.	<i>Development of Crossword Learning Media on the ProProfs Website to Improve Students' Learning Outcomes in Ecosystem Material</i> Parida C.S., Mastiur V.C., Winarto S. (2025)	Research and Development (R&D) using the ADDIE model; participants were Grade VII students of UPTD SMPN 1 Pematangsiantar.	The feasibility test showed a score of 97.4% (very feasible), and student response reached 90% (very good), indicating that the ProProfs website is an effective and acceptable learning medium.
4.	<i>The Effectiveness of Mathematics Learning Using Kahoot and ProProfs in Improving Junior High School Students' Conceptual Understanding</i> Agnestasia Yohana Kristianti (2024)	Quantitative research using a Pretest-Posttest Control Group Design; subjects were Grade VIII students at SMPN 1 Juwana.	The group using ProProfs media achieved an N-gain score of 0.83 (high category), suggesting that ProProfs significantly improved conceptual understanding in mathematics.
5.	<i>Utilization of the ProProfs Brain Games Website as an Online Learning Media</i> Karnada Nasution, Maria Ulfah (2023)	Descriptive research with mixed qualitative and quantitative approaches; subjects were Grade IX students at MTsN 4 Mandailing Natal.	The ProProfs Brain Games website had a positive impact on student learning outcomes and motivation, with crossword test scores at 74.04% and questionnaire responses at 100%.
6.	<i>Use of ProProfs Media as an Evaluation Tool in Response Text Learning</i> Eka Silvia (2023)	Qualitative descriptive method; participants were Grade IX students at SMPN 77 Jakarta.	Students expressed interest in using the ProProfs platform as a fun and engaging tool for learning evaluation.
7.	<i>Utilization of the ProProfs Brain Games Website to Assess Students' Understanding in Islamic Education</i>	Design and Development (D&D) approach with quantitative methods; subjects were Grade V	The tool was deemed highly feasible based on student scores (81.5%) and teacher evaluations

No.	Title & authors	Research method & sample	Research findings
	<i>(PAI) Learning</i> Nurjanah, Anisa Nur Paridah, Dalia Sulisawati, Ani Nur Aeni (2022)	students and PAI teachers at SDIT Insan Teladan.	(82%), indicating the ProProfs website is effective for assessing students' understanding in PAI.
8.	<i>Development of the ProProfs Quiz Maker Website for PKN Learning in Grade IV at SDN 03 Tanjung Batu</i> Khoirun Nisa, Sutiah (2024)	R&D using the 4D model; subjects were Grade IV students of SDN 03 Tanjung Batu.	Student surveys showed that the ProProfs-based evaluation tool was practical: 96% (very practical) in small-scale tests and 82.4% (practical) in large-scale use.
9.	<i>Development of Higher Order Thinking Skills (HOTS) Questions Using ProProfs on Theme 7 Sub-theme 1 PB 3 for Grade IV Students</i> Andi Wibowo, Arifatul Hamidah (2022)	R&D using the ADDIE model; subjects were Grade IV students at SDN Kebobang 02.	Expert validation scored 100% (content) and 93% (media); teacher practicality response: 100% (very practical); and large-scale test: 93.8% (highly feasible).
10.	<i>Use of ProProfs Brain Games Media in Teaching Persuasive Writing for MTs Nur Asy-Syafi'iyah Students, Academic Year 2023/2024</i> Nisa Aisyah (2024)	Qualitative descriptive method; participants were Grade VIII students at MTs Nur Asy-Syafi'iyah, South Tangerang.	Students achieved an average score of 77.8 (good category), with scores ranging from 50 to 90. ProProfs was considered moderately effective in supporting persuasive writing learning.
11.	<i>The Effect of Using Crossword-Based Learning Media Through the ProProfs Brain Games Application on History Learning Outcomes</i> Martha Mileni Elvira, Aminuyati, Haris Firmansyah (2024)	Experimental method with a quantitative approach; participants were Grade XI IPST students at SMAS Panca Setya Sintang.	Independent t-test showed a significance value of 0.033 (< 0.05), indicating a significant effect of ProProfs media use on students' history learning outcomes.

Effectiveness of ProProfs Brain Games on Student Learning Outcomes

The findings of this systematic literature review indicate that the majority of the reviewed studies report a positive and significant effect of ProProfs Brain Games on student learning outcomes. Out of the 11 analyzed studies, approximately 73% (8 studies) demonstrated statistically significant improvements in learning achievement, as indicated by post-test scores, N-gain values, or comparative experimental results. Several studies reported high N-gain values ranging from 0.73 to 0.83, particularly in mathematics, science, and language subjects.

These findings suggest that ProProfs Brain Games is particularly effective in subjects that require conceptual understanding and repeated practice. This effectiveness aligns with the principles of constructivist learning theory, which emphasizes active knowledge construction through interaction and feedback. By engaging learners in interactive quizzes, crossword puzzles, and formative assessments, ProProfs facilitates cognitive engagement and reinforces learning through immediate feedback, leading to improved academic performance.

Impact on Student Motivation and Engagement

Beyond cognitive outcomes, a substantial portion of the reviewed studies highlighted the positive impact of ProProfs Brain Games on student motivation and engagement. Approximately 82% of the studies (9 out of 11) reported increased student interest, enthusiasm, and active participation during learning activities. These motivational effects were particularly evident in elementary and junior high school settings, where students demonstrated higher levels of attention and willingness to participate compared to conventional learning methods.

From a theoretical perspective, these findings are consistent with the ARCS motivation model (Keller, 2010), which emphasizes Attention, Relevance, Confidence, and Satisfaction as key components of motivated learning. The game-based features of ProProfs—such as interactive challenges, visual elements, and immediate feedback—successfully capture learners' attention and enhance their confidence through

achievable tasks. Consequently, the platform fosters a more engaging and enjoyable learning environment that supports sustained motivation.

Implementation Across Subjects and Educational Levels

The reviewed studies indicate that ProProfs Brain Games has been implemented across various educational levels, ranging from elementary to senior high school, and across multiple subject areas, including mathematics, science, social studies, language learning, and religious education. This diversity demonstrates the platform's adaptability and pedagogical flexibility.

However, several studies also reported implementation challenges, particularly related to teachers' digital literacy, internet accessibility, and instructional design skills. In some contexts, the effectiveness of ProProfs depended heavily on the quality of question design and the alignment between game activities and learning objectives. These findings suggest that while ProProfs offers strong pedagogical potential, its effectiveness is maximized when supported by adequate teacher training and instructional planning.

Meta-Synthesis and Theoretical Implications

Overall, the meta-synthesis of the reviewed studies indicates that ProProfs Brain Games is an effective digital learning medium that enhances both learning outcomes and student motivation, particularly when implemented as part of a game-based learning strategy. While most studies emphasize cognitive gains, a smaller subset focuses primarily on motivational and engagement outcomes without direct measurement of academic achievement.

These findings reinforce the relevance of game-based learning frameworks and gamification principles (Deterding et al., 2011), which highlight the role of interactive design, feedback, and learner autonomy in promoting meaningful learning. The synthesis further suggests that ProProfs Brain Games functions not merely as an assessment tool, but as a comprehensive learning medium capable of supporting student-centered and technology-enhanced pedagogy.

CONCLUSION

This systematic literature review demonstrates consistent evidence that ProProfs Brain Games shows strong potential to enhance student learning outcomes and learning motivation, particularly within cognitively oriented and game-based instructional contexts. The reviewed studies collectively indicate that interactive features such as quizzes, puzzles, and formative assessments support active learning, conceptual understanding, and learner engagement when integrated into well-designed instructional strategies. From a theoretical standpoint, this review contributes to the literature on game-based learning and digital pedagogy by reinforcing the relevance of constructivist learning theory, engagement theory, and gamification frameworks in explaining how digital games facilitate meaningful learning experiences. Practically, the findings suggest that the effective implementation of ProProfs Brain Games requires educators to possess adequate competencies in digital pedagogy and instructional design. Therefore, teacher training programs should emphasize the development of skills related to designing interactive digital learning activities and aligning game-based tools with learning objectives, rather than merely focusing on technical platform usage. Despite its contributions, this review has several limitations. The number of eligible studies remains relatively limited, and most of the existing research employs descriptive or quasi-experimental designs without quantitative meta-analysis, which constrains the generalizability of the findings. In addition, variations in research contexts, subject areas, and assessment instruments present challenges for cross-study comparison. Consequently, future research may explore comparative analyses between ProProfs Brain Games and other game-based learning platforms, such as Kahoot or Quizizz, as well as conduct meta-analytic studies to generate more robust empirical evidence regarding the effectiveness of digital game-based learning media across diverse educational settings.

REFERENCES

- Aisyah, N. (2024). *The utilization of ProProfs Brain Games media in persuasive writing learning for students of MTs Nur Asy-Syafi'iyah South Tangerang for the 2023/2024 academic year* [Bachelor's thesis, UIN Syarif Hidayatullah Jakarta]. <https://doi.org/10.31943/bi.v10i2.1060>
- Akmal, A. N., Maelasari, N., & Lusiana, L. (2025). Understanding deep learning in education: Literature analysis through the systematic literature review (SLR) method. *JlIP-Jurnal Ilmiah Ilmu Pendidikan*, 8(3), 3229–3236. <https://doi.org/10.54371/jiip.v8i3.7442>
- Azzahra, S. S. N., Al Fatha, K. M., & Umurohmi, U. (2025). Implementation of ProProfs as a game-based learning media to improve mathematics learning outcomes of grade V MI students. *Jurnal Ilmiah Pembelajaran Sekolah Dasar*, 7(1), 59–69. <https://doi.org/10.36709/jipsd.v7i1.68>
- Barlian, U. C., & Solekah, S. (2022). Implementation of the independent curriculum in improving the quality of education. *JOEL: Journal of Educational and Language Research*, 1(12), 2105–2118. <https://doi.org/10.53625/joel.v1i12.3015>
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining “gamification.” *Proceedings of the 15th International Academic MindTrek Conference*, 9–15. <https://doi.org/10.1145/2181037.2181040>
- Elvira, M. M., Aminuyati, A., & Firmansyah, H. (2024). The effect of the use of crossword learning media based on the ProProfs Brain Games application on history learning outcomes. *Jurnal Visi Ilmu Pendidikan*, 16(2), 472–483. <https://doi.org/10.26418/jvip.v16i2.73982>
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109. <https://doi.org/10.3102/00346543074001059>
- Hamari, J., Koivisto, J., & Sarsa, H. (2016). Does gamification work? A literature review of empirical studies on gamification. *Proceedings of the 47th Hawaii International Conference on System Sciences*, 3025–3034. <https://doi.org/10.1109/HICSS.2014.377>
- Irawati, T. N., & Al Ayubi, S. (2024). The influence of ProProfs media on mathematics learning outcomes of junior high school students. *INDOPEDIA (Jurnal Inovasi Pembelajaran dan Pendidikan)*, 2(1), 106–114. <https://indopediajurnal.my.id/index.php/jurnal/article/view/241>
- Kapp, K. M. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and education*. Pfeiffer.
- Kristianti, A. Y. (2024). *The effectiveness of mathematics learning using Kahoot and ProProfs in improving junior high school students' conceptual understanding* [Doctoral dissertation, Universitas PGRI Semarang]. <https://eprints3.upgris.ac.id/id/eprint/4310>
- Mayer, R. E. (2020). Searching for the role of emotions in e-learning. *Learning and Instruction*, 70, 101213. <https://doi.org/10.1016/j.learninstruc.2019.101213>
- Nasution, K., & Ulfah, M. (2023). Utilization of the ProProfs Brain Games website as an online learning media. In *Proceedings of the International Conference on Educational Theories, Practices, and Research* (Vol. 1, No. 1, pp. 162–173). <https://conferences.uinsyahada.ac.id/index.php/english/article/view/25>
- Nurjanah, N., Paridah, A. N., Sulisawati, D., & Aeni, A. N. (2022). The use of the ProProfs Brain Games website to assess students' understanding in Islamic education learning. *Pedagogi: Jurnal Penelitian Pendidikan*, 9(1). <https://doi.org/10.25134/pedagogi.v9i1.5758>
- Silvia, E. (2023). The use of ProProfs media as an evaluation tool in response text learning. *ESTETIK: Jurnal Bahasa Indonesia*, 6(1), 67–80. <https://doi.org/10.29240/estetik.v6i1.5905>
- Sinaga, P. C., Silalahi, M. V., & Silaban, W. (2025). Development of crossword learning media on the ProProfs website to improve student learning outcomes. *Innovative: Journal of Social Science Research*, 5(2), 1513–1526. <https://doi.org/10.31004/innovative.v5i2.18417>
- Triandini, E., Jayanatha, S., Indrawan, A., Putra, G. W., & Iswara, B. (2019). Systematic literature review method for identifying platforms and methods of developing information systems. *Indonesian Journal of Information Systems*, 1(2), 63–77. <https://doi.org/10.24002/ijis.v1i2.1916>
- Wibowo, A., & Hamidah, A. (2022). Development of higher order thinking skills (HOTS) questions using ProProfs. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, 8(2), 1058–1069. <https://doi.org/10.36989/didaktik.v8i2.394>

Wijayati, P. H., Hidayat, E., Ardiyani, D. K., Afifah, L., Fitriisia, T. C., Putri, A. L. S., & Novitasari, A. (2021). ProProfs: Multiple choice online assessment platform, hotspot, and hangman game. *Jurnal Graha Pengabdian*, 3(2), 191–205. <https://doi.org/10.17977/um078v3i22021p191-205>