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Literature Review of Deep Learning Integrated E-Learning Media Research Trend in Mathematics 2022-2026

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ABSTRACT

The main issue in this study is how effective the use of e-learning media in improving the quality of mathematics learning. The purpose of this study was to review research trends related to the integration of deep learning into e-learning media in the field of mathematics. The research method used was a Systematic Literature Review (SLR) involving 2,540 articles. After the exclusion process, 25 articles published between 2022-2026. The exclusion criteria for article selection were based on empirical research relevant to the topic of deep learning in mathematics through electronic media, published in accredited journals, written in Indonesian or English, and available in full text. The research findings indicate that (1) the trend in research on e-learning media integrated with deep learning shows a fluctuating pattern during the 2022–2026 period, (2) most studies were conducted at Universitas Negeri Surabaya and Universitas PGRI Adi Buana Surabaya, (3) the learning approaches used were PBL and ARCS, (4) numbers were the most dominant topic, and (5) websites were the most commonly used type of e-learning medium. The results of this study can serve as a reference for developing deep learning-based e-learning materials to improve the effectiveness of mathematics instruction.

1. Introduction

Education is a conscious and planned effort through teaching, training, and research to gain experience, skills, knowledge, and habits that are passed down from one generation to another (Pristiwanti et al., 2022). Education can also be interpreted as a process of transferring knowledge and values to form the personality of students (Witono et al., 2023). In line with the times, education utilizes technological advances to enable more interactive, collaborative, and personalized learning. The rapid development of technology in recent years has opened up new opportunities in education that allow teachers and learners to take advantage of the latest technological innovations in learning activities (Fricticarani et al., 2023). The

utilization of this technology aims to facilitate and improve the efficiency of teachers and students in improving the quality of learning. The implementation of technology in education allows a learning system that adapts to the learning speed, learning style, and interests of each learner (Latumahina et al., 2023). The adjustments made in the field of technology-integrated education aim to achieve national education goals.

Indonesian national education has objectives listed in Law Number 20 of 2003, which means that education is a form of effort that starts from humans as they are (actualization) with various considerations of what they are (potentiality), and is directed towards what is aspired or the realization of humans who should be (ideality) (Nurandriani & Alghazal, 2022). In addition, education aims to enable humans to fulfill their needs properly, control themselves, have a mature personality, be able to interact socially, and appreciate culture. Education has an important role in developing students' critical and creative thinking skills as essential competencies to support their academic success, particularly in mathematics instruction in elementary school (Rizky et al., 2026). Thus, education must be able to develop all human potential as a whole and integrated, including diversity, moral values, individual uniqueness, socialization skills, and cultural understanding. In short, the essence of education lies in the effort to make humans more human.

Proses The educational process in humanizing humans is based on the implementation of optimal learning (Safitri & Gistituati, 2024). Indonesia's success in optimizing learning and increasing access to primary and secondary education is recorded in the Gross Participation Rate (APK) data, namely for primary schools (104.97%) and junior high schools (90.67%) (Badan Pusat Statistik, 2024). However, despite these achievements, the quality of learning is still an issue, especially in terms of reading literacy and numeracy, as shown by the Program for International Student Assessment (PISA) results. PISA data also shows that Indonesian students' literacy and numeracy skills are below the international average (Math: 472, Science: 485, Reading: 476), placing Indonesia in 68th position out of 81 countries with scores: math (379), science (398), and reading (371) (OECD PISA, 2024). The gap in learning effectiveness between schools and madrasahs in Indonesia is one of the factors that contribute to unsatisfactory learning outcomes (Nurfatimah et al., 2022). Learning conditions that are not maximized will have an impact on the quality of education in Indonesia. Teachers as educators have an important role in striving for optimal learning for students (Ngaisah et al., 2023). One form of teacher effort in optimizing learning is by using learning media that is appropriate to the material and interesting for students (Juhaeni et al., 2023).

Learning media plays a very crucial role in efforts to achieve national education goals. Media can be interpreted as a channel or intermediary used by message senders to convey learning materials to message recipients (students) (Daniyati et al., 2023). The main purpose of using media in this context is to realize the learning process. The utilization of media in learning provides a real experience for students so that learning is more innovative and interactive for students (Trimurtini et al.,

2021). Instructional media serve as a means of conveying information, helping to make the learning process more engaging, less tedious, and easier to understand. Students who are interested in the learning will pay more attention to topics that interest them and ignore everything else (Arif et al., 2025). They also help teachers design effective lessons that meet student's need (Sarwati et al., 2026). Learning media today is not limited to concrete media, but innovates following technological developments into digital media or known as e-learning media. Digital learning media has the potential to enhance students' learning abilities by presenting material in an interactive, visual, and easy-to-understand manner, thereby supporting conceptual understanding more effectively (Nurkhafifah et al., 2026). Digital learning media/e-learning media is a digital or electronic-based intermediary that bridges learning materials from various learning resources to achieve the learning objectives to be achieved (Susanto, 2021). Access to e-learning media can use a laptop or cellphone connected to the internet network. Through this digital learning media, students can access learning materials repeatedly without being limited by space and time.

Learning media must certainly adjust the material in the current curriculum with an effective approach. Learning media with the integration of the right approach will help students understand learning messages and create an effective and enjoyable learning atmosphere (A. A. Putri & Ardi, 2021). The current learning approach launched by the Ministry of Education, Culture and Research is the deep learning approach or referred to as Deep Learning (PM). This approach is designed to foster students' cognitive, affective, and psychomotor abilities more comprehensively (transferable skills) that can be applied in various subjects and learning situations (Kemendikdasmen, 2025). The methods expected in this deep learning approach are Meaningful learning, Mindful learning, and Joyful learning (Diputera et al., 2024). Deep learning emphasizes that learning is not just a transfer of knowledge but an atmosphere that ennobles learners by prioritizing intellectual, emotional, spiritual, and physical balance. The deep learning approach applied in all subject matter bridges learners' understanding with cultural, social, and daily challenges, hoping to encourage them to think critically, analytically, and synthesize (Riyadi et al., 2025).

Mathematics is a basic science subject that students must master as a provision for exploring other sciences and is included in the national curriculum (Amalia & Dewi, 2024). Based on the Law of the Republic of Indonesia Number 20 of 2003 Article 37, it is explained that mathematics is a compulsory subject taught from primary education to senior secondary education in Indonesia (Mahesa & Dewi, 2025). Mathematics often considered a difficult subject by elementary school students because it frequently involves understanding abstract concepts, which requires appropriate teaching materials for the learning process (Laili et al., 2026). The purpose of mathematics education is to understand the concept of studying patterns of structure, change and space, as well as the science of numbers and numbers; applying it in everyday life, to the development of critical thinking skills (Hayati & Jannah, 2024). Based on this, to improve the quality of better mathematics learning, an attractive learning media is needed which is accompanied

by an appropriate learning approach so as to make students active in the material presented by the teacher (Rahma et al., 2023).

Research on the development of learning media integrated with deep learning is currently not widespread, but the development of e-learning media with meaningful and fun material has been widely applied in education. Research by (Fatayan et al., 2025b) who developed e-learning interactive learning media Educandy can significantly increase students' interest in learning, strengthen concept understanding, and make it easier for students to remember the material. Based on e-learning media development research by (Lobo et al., 2024), namely using electronic media application Math Games shows the results significantly improve the numeracy skills of students by 55% with an average score of 80 with a good category. Based on this previous research, electronic learning media/e-learning media can significantly improve the mathematics learning process in line with learning that is carried out with meaningfulness, consciously, and with fun in accordance with the deep learning approach. So, every math lesson taught at school should apply the deep learning approach and fun learning media to achieve meaningful learning goals (Khotimah & Abdan, 2025). The purpose of this study is to determine the research trend of e-learning media integrated deep learning in the field of mathematics in 2020-2025. The benefits of this research are to provide an overview to readers about the research trends of e-learning media integrated deep learning in the field of mathematics.

2. Methodology

The research contained in this article was prepared based on the Systematic Literature Review (SLR) method, which is a systematic literature review approach. SLR is a research method that is carried out systematically, aims to identify, evaluate, and interpret all research results on a topic, thereby minimizing subjective interpretations and biases in literature review research (Habibi & Manurung, 2023). SLR is a literature review research method that aims to obtain research gaps and new research areas of interest (Dinter et al., 2021). This research method helps researchers to identify, select, evaluate, and synthesize research as relevant empirical evidence to answer specific research questions. Identification is done to find studies that match the relevant research topics.

The identification process in this research utilizes the Publish or Perish (PoP) software by using the keywords “E-Media deep learning Mathematics”. The article search was limited to articles published between 2022 and 2026 that covered mathematics curriculum content and were applied in elementary schools. A search of the Scopus and Google Scholar databases yielded 2.540 articles. After an initial screening based on relevance and the availability of open-access PDFs, 646 articles remained. A selection based on titles and abstracts resulted in 66 articles. Subsequently, an evaluation of the full texts eliminated 41 articles, consisting of 27 theses/dissertations and 14 articles that did not align with the focus on mathematics education. Thus, the number of articles meeting the verification criteria for the topic of e-learning trends integrated with deep learning totaled 25.

After the selection process was completed and 25 articles that met the selection criteria were identified, the data were then extracted using a structured data extraction sheet. The information collected included the year of publication, the university or institution where the research was conducted, the journal's accreditation, the learning model used, the research theme, the type of e-media used, the implementation of the deep learning approach, the mathematics material or content studied, and the main findings. This information facilitated the researchers' analysis, categorization, and synthesis of data from each article. Subsequently, the extracted data were coded and grouped based on similarities in research characteristics and research objectives.

The data synthesis process was conducted using qualitative thematic analysis. This analysis was used to interpret patterns or themes emerging from a set of qualitative data based on findings from articles that met the inclusion criteria. Articles with similar criteria were categorized into several themes, including the types of e-media used, the integration of deep learning principles in mathematics education, learning outcomes, and emerging research trends. The findings from each category were then compared and synthesized to identify patterns, research gaps, and opportunities for future research regarding the implementation of e-media integrated with a deep learning approach in mathematics education in elementary schools. The data search process can be seen in the stages illustrated in Figure 1.

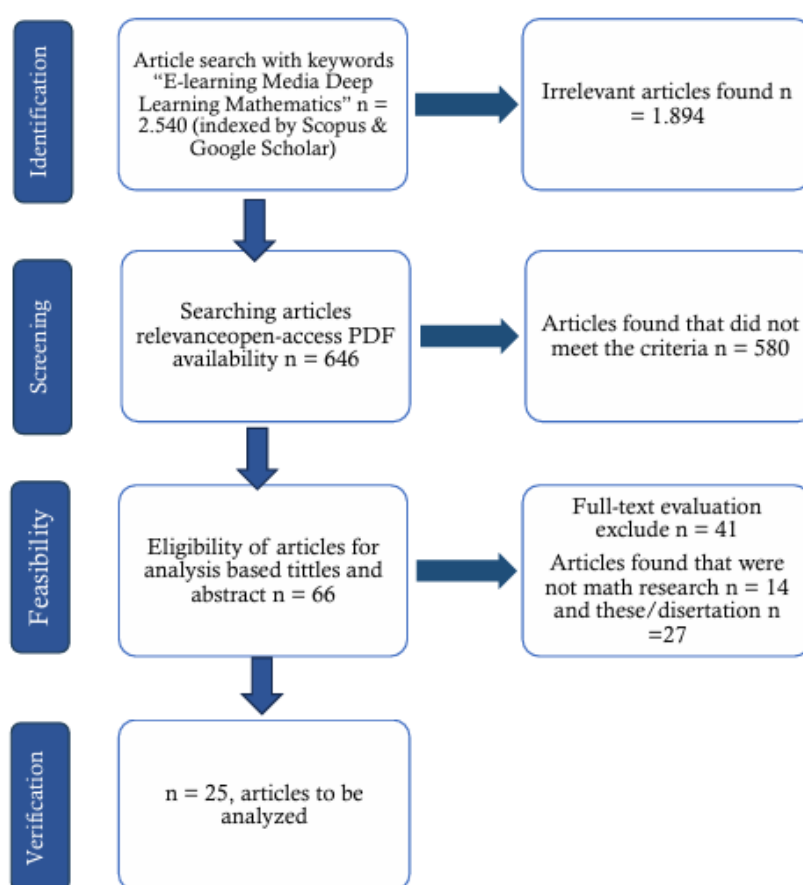


Figure 1. PRISMA Flow Diagram Article Selection

Article data that has been obtained on the topic of e-learning media trends integrated with deep learning in the field of mathematics in 2022-2026 in Figure 2.

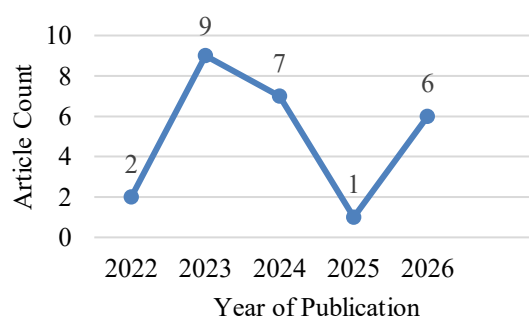


Figure 2. Deep Learning Integrated E-Learning Media Research Publication Chart

In 2022 2 articles, in 2023 9 articles, in 2024 7 articles, in 2025 1 article, and in 2026 6 article. Based on the articles obtained, there are universities/schools in Indonesia that contribute to conducting research on e-learning media integrated with deep learning in the field of mathematics which is presented in the graphical data in Figure 3.

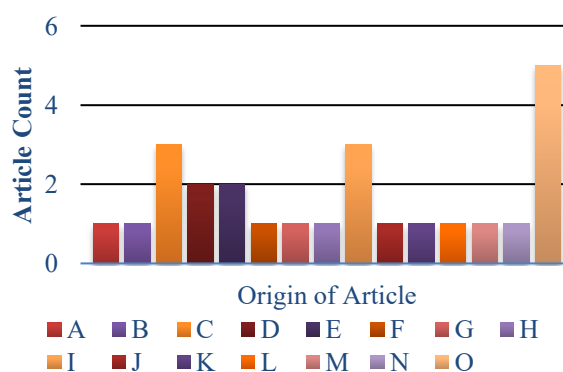


Figure 3. Graph of University/school of Origin of Deep Learning Integrated E-Learning Media Research Articles

The description or information of each university or school from which the articles originated can be found in Table 1.

Table 1. Chart Description University/ Institution of Origin

University/Institution of Origin	Symbol
Gogte Institute of Technology	A
University of Notre Dame Australia	B
Universitas Negeri Surabaya	C
Universitas Pendidikan Indonesia	D
Universitas PGRI Adi Buana Surabaya	E
Universitas Pendidikan Ganesha	F
Universitas Negeri Medan	G
Universitas Muhammadiyah prof Dr Hamka	H

University/Institution of Origin	Symbol
Universitas Negeri Malang	I
Universitas Lampung	J
Universitas Negeri Padang	K
Universitas La Tansa Mashiro	L
Universitas Labuhanbatu	M
Universitas Lampung	N
Instansi lain	O

Articles analyzed on the topic of e-learning media integrated deep learning in mathematics based on the highest accreditation index are described in Table 2.

Table 2. Article Deep Learning Integrated E-Learning Media with The Highest Accreditation Index

Journal	Article Title	Author	Index
Journal of Pedagogical Research.	The Emergence of Computational Thinking in National Mathematics Curricula: An Australian Example	Whitney & Smith, 2023	Scopus Q2
International Journal of Engineering Trends and Technology	Student Performance Analysis using Bayesian Optimized Random Forest Classifier and KNN	Begum & Padmannavar, 2023	Scopus Q4
Communications in Computer and Information Science	Rewriting Math Word Problems to Improve Learning Outcomes for Emerging Readers: A Randomized Field Trial in Carnegie Learning's MATHia	Almoubayyed et al., 2023	Scopus Q4
ALJABAR: Journal of Mathematics Education	Analysis Of The Use Of Geogebra As An Interactive Learning Media In Improving Understanding Of Flat Shape Area Calculation Skills In 3rd Grade Elementary School	Qurota'aini et al., 2024	Sinta 2

Based on table 2, it is explained that the analyzed article has the highest index of Scopus Q2 from the Pedagogical Research Journal. The highest sinta index is from ALJABAR: Journal Mathematics Education indexed sinta 2.

3. Results and Discussion

Publication of Articles on the Topic of Electronic Learning Media in Mathematics

A systematic analysis of the 25 articles selected based on inclusion criteria was conducted using qualitative thematic analysis. Data from each article were extracted using a structured coding sheet or data extraction form. This included information on the year of publication, research objectives, research design, learning media, mathematics content, the implementation of deep learning, and research findings. The extracted data were then coded and grouped based on common characteristics for synthesis.

Based on the results of the analysis using the graduation of e-learning media research articles integrated with deep learning in the field of mathematics for the period 2022-2026, 25 articles were found. The articles were published in journals indexed by Scopus and Google Scholar. Based on Figure 2, it can be explained that the trend of e-learning media research integrated with deep learning develops fluctuate for each year. In 2025, one article was identified that aligns with research on e-learning media integrated with deep learning in the field of mathematics. Meanwhile, 2023 was the year with the highest number of published articles on e-learning media integrated with deep learning, totaling 9 articles. The data search was conducted using the Publish or Perish software with the keyword “E-Media deep learning Mathematics.”

Analysis of Figure 3 shows that the universities with the highest number of research articles on e-learning platforms integrated with deep learning are Surabaya State University and Malang State University, with 3 articles each, as well as the Indonesia University of Education and PGRI Adi Buana University Surabaya, with 2 articles each. Based on this data, it is evident that research on e-learning media integrated with deep learning in the field of mathematics is primarily conducted on the island of Java. A review of foreign literature based on Scopus article identification data reveals that the regions of origin for the development of e-learning media integrated with deep learning in mathematics are Australia and India. Based on this data, this literature review can serve as a reference for readers interested in research on the topic of e-learning media integrated with deep learning in mathematics so that it can be applied in a more optimal learning process.

Based on table 2, it can be seen that the highest accreditation index was carried out by (Whitney & Smith, 2023) which is indexed by Scopus Q2. The research examines Artificial Intelligence (AI) as an e-learning media integrated with deep learning in the field of mathematics to get significant results in improving computational thinking skills in flat building and number material.

E-Learning Media Development Orientation in Mathematics Topics

Based on the analysis of the 25 articles reviewed, two articles described the learning models they applied: the study by Primadewi & Agustika (2022), which applied the Problem-Based Learning (PBL) model to e-learning media in the form of animated videos, and the study by Yulianto et al. (2024), which used the ARCS (Attention, Relevance, Confidence, and Satisfaction) learning model. The other studies in the 18 articles did not specify the learning models used and focused instead on the effectiveness of using media to improve the skills or competencies to be achieved. The data on the learning models identified in the analyzed articles, along with their authors, are presented in Table 3.

Table 3. Learning Model for Deep Learning Integrated E-Learning Media Research in Mathematics

Learning Model	Author
PBL	Primadewi & Agustika (2022)
ARCS	Yulianto et al. (2024)

A learning model that aligns with the media used can optimize learning. The development of e-learning media creates meaningful, active, and enjoyable learning activities that are effective in improving students' understanding (Hakiki & Fadli, 2021). Meaningful and enjoyable learning in line with the deep learning approach makes students able to master the competencies set. The right learning model implemented is a learning model that is in accordance with the ability of students, teacher competence, and the subjects taught (Nurazmi & Bancong, 2021).

Analysis of Research Themes for E-Learning Media Development in Mathematics

Article analysis that has been carried out on 25 research articles on e-learning media integrated with deep learning in mathematics has a variety of research themes. The research themes taken are adjusted to the problems faced in real conditions. The research theme or ability distribution is presented in the diagram in Figure 4.

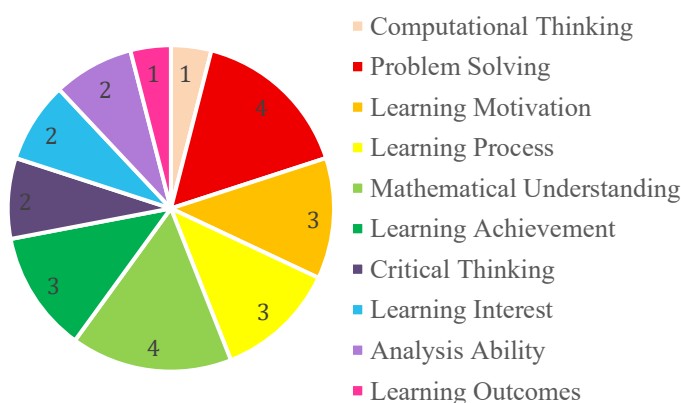


Figure 4. Research Theme Analysis of Learners' Ability Domains in Journal Articles

The data presented in Figure 4 indicate that the most common research themes are problem-solving and mathematical understanding, each accounting for 16% of the total, with four research articles in each field. Research with the theme of problem solving was conducted by Putri et al. (2024), Setiawan et al. (2023), and Daryanes et al. (2023). While the theme of mathematical understanding research was carried out by Ramadhanti et al. (2024), Fatayan et al. (2025a), Silitonga & Rahma (2023), and Qurota'aini et al. (2024). Problem solving and mathematical understanding are competencies that must be mastered by students in the field of mathematics. Mathematics learning that utilizes technology becomes more effective and efficient to improve students' competencies, because mathematics has abstract concepts that use many images, graphs, and applications in real life (Dewi & Maulida, 2023).

Mathematics Subject Used in E-Learning Media Development on Mathematics Topic

Data analysis on 25 articles with e-learning media studies integrated with deep learning in the field of mathematics uses a variety of subject matter according to the problems faced in each study. The mathematics materials that examine the subject matter are presented in Table 4.

Table 4. Mathematics Materials on E-Learning Media Integrated with Deep Learning

Author	Material
(Whitney & Smith, 2023), (Putri et al., 2024), (Qurota'aini et al., 2024), (Rahman & Indrawati, 2026)	Flat Shape
(Cahyani et al., 2023), (Cholily et al., 2023)	Space Shape
(Primadewi & Agustika, 2022), (Wulandari, 2022), (Iriawan et al., 2024a), (Ashari & Qohar, 2024), (Fatayan et al., 2025b)	Fractions
(Silitonga & Rahma, 2023), (Daryanes et al., 2023), Daryanes <i>et al.</i> , (2023), (Kalaka et al., 2023), (Begum et al., 2023), (Almoubayyed et al., 2023), (Sinaga, 2024), (Yulianto et al., 2024), (Hidayat et al., 2026), (Hidayatillah et al., 2026), (Setianingsih et al., 2026), (Tantiyah & Indrawati, 2026), (E. A. Putri et al., 2026)	Numbers
(Ramadhanti et al., 2024)	Speed and Discharge
(Setiawan et al., 2023)	Lines and Angles

Mathematics learning that is applied in the research articles analyzed is mostly on number material. Number material in mathematics is widely used in research because students experience many difficulties so that e-learning media integrated with deep learning is applied to be conveyed properly. Learning materials need to be prepared in advance by educators before being applied to students so that the material can be conveyed properly (Gusteti, 2022).

Various Forms of E-Learning Media Development in Mathematics

The study that has been conducted in the article on the topic of e-learning media trends integrated with deep learning in mathematics learning uses various forms of technology media. The data is presented in Table 5.

Table 5. Various Forms of E-Learning Media Integrated Deep Learning in Mathematics

Author	Variety of E-Learning Media
(Almoubayyed et al., 2023; S. Begum & Padmannavar, 2023; Sinaga, 2024; Whitney & Smith, 2023)	Artificial Intelligence (AI)
(Ashari & Qohar, 2024; Daryanes et al., 2023; Fatayan et al., 2025b; Hidayat et al., 2026; Hidayatillah et al., 2026; Putri et al., 2026; Putri et al., 2024; Qurota'aini et al., 2024; Rahman & Indrawati, 2026; Ramadhanti et al., 2024; Setianingsih et al., 2026; Setiawan et al., 2023; Tantiyah & Indrawati, 2026; Yulianto et al., 2024)	Website
(Iriawan et al., 2024b)	Mutimedia Audio Video
(Cahyani et al., 2023; Primadewi & Agustika, 2022)	3D Animation
(Cholily et al., 2023; Kalaka et al., 2023; Silitonga & Rahma, 2023; Wulandari, 2022)	Application

Based on the results of the analysis used, the variety of media technology or e-learning media used is Artificial Intelligence (AI), websites, multimedia Audio video, 3D animation, and applications with the development of e-learning media integrated deep learning in mathematics learning. Based on the above data analysis, it can be concluded that the main trend in this study is the use of websites as e-learning media in mathematics education. The results of the article analysis of e-learning media trends integrated with deep learning in mathematics have proven to be effective in learning. The success of a study depends on the subject's experience in applying the intervention provided. In this study, he students as research subjects, gained experience meaningful experiences with fun learning so that their abilities in the field of mathematics can increase.

Research findings indicate that web-based learning media will be the most widely used during the 2022–2026 period. This is due to the flexible nature of websites, their ease of access, minimal storage requirements, and their ability to be used on various devices without the need to install specialized applications. In addition, the use of websites allows teachers to integrate various learning resources, instructional videos, interactive exercises, discussion forums, and learning assessments into a single platform. These conveniences make web-based media a practical tool for supporting the mathematics learning process both inside and outside the classroom.

Analysis of E-Learning Media Development in Mathematics Integrated with Deep Learning

The deep learning approach is in fact an approach that perfects other approaches. The deep learning approach integrates joyful, meaningful, and mindful learning in its implementation has been applied in innovative and fun learning (Diputera et al., 2024). Mindful learning is reflected in learners' active mental and physical involvement in the learning process, openness to new experiences, and flexible thinking. Meaningful learning is the process by which learners learn new information and integrate it with their existing knowledge or experience. Deep learning, in its study, is based on the principle of meaningful learning that prioritizes fundamental understanding rather than mere recall. Joyful learning emphasizes the relevance of students' real life with active learning so that they can gain direct experience both emotionally and intellectually. Interactive, active and collaborative learning will motivate learners to understand the material deeply and improve their retention and understanding. The integration of deep learning approach in digital learning media is presented in Table 6.

Table 6. E-Learning Media Integrated with Deep Learning in Mathematics

Author	Deep Aspect	Learning
(M. Begum et al., 2023; Cahyani et al., 2023; Cholily et al., 2023; Setiawan et al., 2023; Sinaga, 2024; Whitney & Smith, 2023)	Mindful	
(Almoubayyed et al., 2023; Ashari & Qohar, 2024; Daryanes et al., 2023; Fatayan et al., 2025b; Hidayat et al., 2026; Hidayatillah et al., 2026; E. A. Putri et al., 2026; R. A. Putri et al., 2024; Qurota'aini et al., 2024; Rahman & Indrawati, 2026; Ramadhanti et al., 2024;	Meaningful	

Setianingsih et al., 2026; Silitonga & Rahma, 2023; Tantiyah & Indrawati, 2026)

(Iriawan et al., 2024b; Kalaka et al., 2023; Primadewi & Agustika, Joyful 2022; Wulandari, 2022; Yulianto et al., 2024)

Based on the results of the analysis of articles with digital learning media on mathematics material, 6 articles were found that emphasized mindful learning, 14 articles emphasized meaningful learning, and 5 articles emphasized joyful learning. The analysis carried out based on the awareness indicator is learning media that fully engages mentally and physically learners in a flexible and open thinking process. Indicators of meaningful learning emphasize media that link new information with information that learners already have. One of the indicators of fun learning is the use of media that prioritizes direct involvement of learners emotionally and intellectually in active learning activities. This is supported by Kurniawati et al. (2026), who explain that the pedagogical context of deep learning focuses on deep conceptual understanding, critical thinking, and meaningful integration of knowledge. The analysis applied in the indicators of deep learning, namely, awareness indicators, namely learners are able to focus and be aware in the learning process, meaningful learning indicators are reflected in the connection of new knowledge with existing knowledge, and exhilarating indicators, namely active interaction of learners and feeling happier in the active learning process (Mariana et al., 2024).

These findings indicate that the meaningful learning approach is the most dominant aspect of deep learning. This is because meaningful learning emphasizes the connection between new knowledge and students' prior experiences and existing knowledge. Learning takes place in a more contextual manner, based on real-world experiences. This approach helps students understand concepts more deeply rather than merely memorizing formulas. Meaningful learning is considered more effective at developing students' critical thinking, problem-solving, and conceptual understanding skills in elementary school mathematics.

The prevalence of website use and meaningful learning approaches during the 2022–2026 period is influenced by several factors. Based on the results of the synthesis, it was found that advances in digital technology have driven the availability of various web-based learning platforms that are easy to develop and implement. Educational policy factors are also increasingly emphasizing student-centered learning, the integration of digital education transformation, and the strengthening of deep learning approaches for meaningful learning. Thus, the identified research trends not only reflect technological developments but also indicate a paradigm shift toward learning oriented toward conceptual understanding and the comprehensive development of student competencies.

4. Conclusion

Based on the data from this study, it can be concluded that the distribution of annual publications from 2022-2026 shows a fluctuating research trend. Thus, this does

not indicate stable continuity in research on deep learning in e-media mathematics. Although the number of publications generally increased during the study period, there was a decline in 2025, indicating that research outcomes vary from year to year. The universities that conducted research on the trend of e-learning media integrated with deep learning are Universitas Negeri Surabaya and Universitas PGRI Adi Buana Surabaya. The learning models applied in e-learning media integrated with deep learning are Problem-Based Learning (PBL) and ARCS (Attention, Relevance, Confidence, and Satisfaction). The dominant research themes in the trend of e-learning media integrated with deep learning are problem-solving and mathematical understanding. The mathematics content that dominates this field of research relates to numbers. Related research utilizes various media, such as Artificial Intelligence (AI), websites, multimedia (audio and video), 3D animations, and applications, in the development of e-learning media integrated with deep learning for mathematics education. Websites are the most widely used e-learning medium among researchers. The findings of this review can serve as a guide for teachers, instructional media developers, and researchers in designing more effective deep learning-based e-learning. The development of learning media should integrate deep learning principles into its features, activities, and learning assessments. In addition to providing easily accessible content, e-learning media must be designed to encourage students to build conceptual understanding, develop critical thinking and problem-solving skills, collaborate, and connect mathematical concepts to real-life contexts. Future research is recommended to expand the scope of data sources by utilizing more diverse international databases, such as Scopus, Web of Science, and ERIC, to obtain a more comprehensive representation of the research. Additionally, using a longer publication timeframe will provide a more complete picture of research trend developments.

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