

Elementary School Teachers' Perception of the Use of AI in the Preparation of Learning Tools

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Abstract: This study aims to comprehensively examine primary school teachers' perceptions of the use of Artificial Intelligence (AI) in the development of teaching and learning materials through a synthesis of various published research findings. The study employed a Systematic Literature Review (SLR) method, adhering to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which encompass the stages of identification, screening, eligibility assessment, and article selection. Literature sources were obtained from the Google Scholar, Scopus, ERIC, ScienceDirect, and Garuda databases, covering publications from 2016 to 2026. The findings indicate that primary school teachers generally hold a positive perception of the use of AI, as it enhances efficiency, supports creativity, and facilitates the development of teaching modules, teaching materials, learning media, and assessment instruments. The implementation of AI still faces various challenges, including limited digital literacy, the digital divide, and issues regarding ethics and the accuracy of information. Strengthening teachers' competencies, policy support, and the development of adaptive and sustainable AI utilisation are crucial aspects in improving the quality of learning in primary schools.

Keywords: Artificial Intelligence; Instructional Materials; Systematic Literature Review

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A. INTRODUCTION

The development of digital technology in the 21st century has driven changes in many aspects of life, including in the field of education. One of the innovations that is currently experiencing rapid growth is Artificial Intelligence (AI), a technology that allows computers to perform various tasks that usually require human abilities such as analyzing data, solving problems, creating content, and providing suggestions based on existing information (Chakim & Bimantara, 2023). In the world of education, AI is no longer considered an upcoming technology but has become part of daily teaching and learning activities. The emergence of various AI-based platforms such as ChatGPT, Gemini, Copilot, and other educational applications presents new opportunities to support more effective, flexible, and individual learning processes. The use of AI in education has become one of the important topics that have attracted the interest of academics, education practitioners, and policymakers in different parts of the world (Suyitno et al., 2024).

As a professional, teachers have the responsibility to design and implement quality education with the aim of achieving learning outcomes. One of the important responsibilities of a teacher is to create a learning tool that includes learning outcomes, learning objectives, teaching materials, learning media, student worksheets, and assessment tools (Romadhon & Irfan, 2025). In the implementation of the Independent Curriculum, teachers are expected to produce learning tools that are more flexible according to the context, student-centered, and can support diverse learning (Koimah et al., 2024). Various studies show that compiling learning tools is often a challenge for teachers because it requires pedagogic skills, creativity, digital literacy skills, and sufficient time. The complexity of the task encourages teachers to look for alternatives and innovations that can help improve efficiency in educational planning (Wiwik & Murniyati., 2025).

Artificial Intelligence offers many opportunities that educators can take advantage of in designing learning materials in a more efficient and effective way (Gea et al., 2025). With the help of AI technology, teachers can get support in setting learning goals, compiling learning modules, creating assessment tools, formulating evaluation rubrics, producing educational media, and arranging learning activities that suit students' characteristics (Damayanti et al., 2025). AI's capacity to quickly process data allows teachers to get a wide range of references and teaching strategy options that are in line with the needs of the classroom (Fajrussalam et al., 2025). The use of AI also has the potential to reduce the administrative work faced by teachers so that they can concentrate more on the aspects of teaching and interacting with students. With its various benefits, AI is increasingly seen as one of the technologies that can support improving the quality of learning planning at the primary education level (Fitriani et al., 2024).

Although it has many possible advantages, the success of the application of AI in the education sector is not only determined by the level of technological sophistication, but also by the attitude of users, especially teachers (Agustiana et al., 2026). In various theories of technology adoption, an individual's view of a particular innovation is a crucial element that influences the choice to accept or reject the use of that technology (Sugiono, 2024). Teachers' views on AI can include an analysis of the ease of use, the benefits obtained, the level of confidence in the results produced by AI, as well as the various risks that may occur during its use (Agustiana et al., 2026). A positive view can encourage teachers to make maximum use of AI in the preparation of learning tools, on the other hand, a negative view can be a barrier in the technology adoption process (Syahria & Darlis, 2025). Understanding teachers' views is a critical aspect to support the successful application of AI in primary education (Rahayu et al., 2025).

Several previous studies have shown that the use of artificial intelligence in the world of education has received various responses from teachers. Several studies state that educators have a positive view of the application of AI because it can improve work efficiency, speed up the process of making learning tools, and provide various innovations in designing learning activities (Astuti, Tri; Priambada, Dadang; Faelasuf, Mohamad; Nurwati, 2024). Several studies have found doubts and concerns among teachers regarding the use of AI. These concerns include the possibility of inaccurate information, the risk of academic ethics violations, the protection of user data, and the potential for dependency that can reduce

teachers' critical thinking skills and creativity in planning learning (Dewi Ika Sari et al., 2026). These differences in results show that teachers' views on the use of AI are still variable and influenced by various personal, institutional, and technological factors (Ataupah et al., 2024).

Although the number of studies on Artificial Intelligence in education has increased rapidly in recent years, the majority of research is still centered on how effective AI is in improving student learning outcomes, the development of AI-based teaching tools, or the application of AI in the learning process in general (Muin & Kusmaladewi, 2025). Research that specifically examines the views of elementary school teachers regarding the use of AI in the manufacture of learning tools is still quite rare. The findings of published studies show mixed results and have not been compiled in an integrated manner, making it difficult for researchers to gain a comprehensive understanding of the development of studies in this field (Sidkiyah et al., 2025). This situation shows the need to conduct a systematic literature review to identify research patterns, characteristics of teachers' opinions, factors influencing the acceptance of AI, as well as challenges and opportunities in its application in the context of basic education (Abdullah, 2026). This research offers novelty by focusing on the study specifically on the perception of elementary school teachers towards the use of Artificial Intelligence (AI) in the preparation of learning tools. Until now, this kind of study is still relatively limited compared to AI research which is more oriented towards student learning outcomes or the implementation of AI in the learning process in general. In contrast to previous studies that generally use a survey or case study approach in a specific context, this study integrates various empirical findings through an approach *Systematic Literature Review* (SLR).

This research aims to conduct a thorough analysis of various scientific publications that discuss how elementary school teachers' views on the use of Artificial Intelligence in the manufacture of learning tools. Using the Systematic Literature Review method, this study seeks to recognize the progress of research that has been conducted, map the types of teachers' views on the use of AI, analyze the factors that influence the acceptance and use of AI in the development of learning tools, and evaluate the various advantages and challenges faced in its application. It is hoped that the findings of this study can contribute theoretically to the development of studies on the adoption of educational technology, as well as a reference for decision-makers, educational institutions, and teacher training programs in designing strategies to improve teachers' abilities to welcome changes in education based on artificial intelligence in the future.

B. METHOD

This study uses a qualitative method with a *Systematic Literature Review* (SLR) approach to identify, evaluate, and synthesize various research results related to the perception of elementary school teachers towards the use of Artificial Intelligence (AI) in the preparation of learning tools. The SLR approach was chosen because it allows researchers to gain a comprehensive understanding of research trends, benefits, challenges, and factors that affect the use of AI in educational practices. The entire literature selection process was carried out based on stages that refer to the *Preferred Reporting Items for Systematic Reviews and Meta-*

Analyses (PRISMA) guidelines which include the stages of *identification, screening, eligibility, and determination* of articles included *in the study*.

This study aims to analyze and synthesize the results of research that discuss the perception of elementary school teachers towards the use of *Artificial Intelligence* (AI) in the preparation of learning tools. The study focused on identifying teachers' perceptions of the benefits, ease of use, effectiveness, challenges, and obstacles in utilizing AI to develop learning tools such as teaching modules, teaching materials, learning media, assessment instruments, and other learning support documents. Literature searches were carried out systematically on several relevant scientific databases, namely Google Scholar, Scopus, ERIC, ScienceDirect, and Garuda. The search process uses a combination of keywords in Indonesian and English, including "*Artificial Intelligence*", "*AI in Education*", "*Teacher Perception*", "*Elementary School Teacher*", "*Primary School Teacher*", "*Instructional Planning*", "*Learning Devices*", "*Teacher Perception*", "*Elementary School Teacher*", and "*Learning Tools*". The articles searched are limited to the publication range of 2016-2026 to obtain literature that reflects the latest developments in the use of AI in education. All articles found are then collected and managed using reference management software to simplify the process of identifying and managing data.

The inclusion criteria in this study include: (1) research articles that discuss the use of AI in educational contexts; (2) research that examines teachers' perceptions, attitudes, acceptance, or experience of the use of AI; (3) research involving elementary school teachers or discussing the preparation of learning tools; (4) articles published in scientific journals or proceedings that have gone through the peer review process; (5) the article is available in *full text*; (6) articles published in the period 2016–2026. The exclusion criteria include: (1) articles that are not relevant to the focus of the research; (2) articles that only discuss the technical aspects of AI development without any connection to learning practices; (3) articles in the form of editorials, opinions, books, or non-scientific reports; (4) articles that are not available in full text; and (5) duplicate articles found in more than one database.

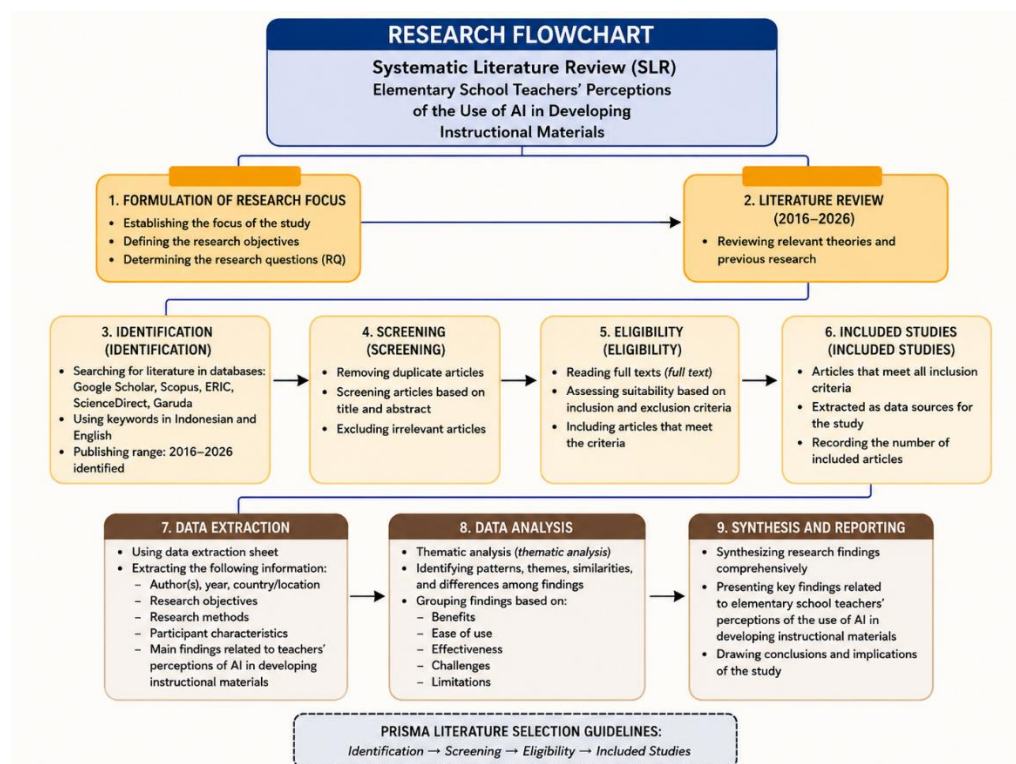


Figure 1. Systematic Literature Review *Research Flow*

Figure 1. Showing The article selection process is carried out based on the PRISMA stages. At the identification stage, all articles obtained from various databases are collected and recorded. Furthermore, at the screening stage, duplicate articles are removed and filtered based on titles and abstracts. Eligible articles then enter the eligibility stage through full-text review to ensure their fit for inclusion and exclusion criteria. In the final stage, articles that meet all criteria are designated as the data sources in the study. Data from the selected articles were then extracted using a data extraction sheet that contained information about the author's name, year of publication, country or location of the research, research objectives, research methods, characteristics of participants, and key findings related to teachers' perceptions of the use of AI in the preparation of learning tools. The data was analyzed using thematic analysis techniques to identify patterns, themes, similarities, and differences in findings between studies so that a comprehensive synthesis of elementary school teachers' perceptions of the use of AI in the preparation of learning tools was obtained.

C. RESULTS AND DISCUSSION

The results of this study were compiled using the Systematic Literature Review (SLR) approach by analyzing various articles that discuss the use of Artificial Intelligence (AI) in the field of education, especially related to the role of teachers in compiling learning tools. The literature synthesis process is carried out by identifying the main themes that appear consistently in various studies. Based on the results of mapping and grouping of articles, it was found that the three most dominant main focuses were: (1) the perception of elementary school teachers on the use of AI in the preparation of learning tools, (2) the benefits and

challenges felt by teachers in using AI to develop learning tools, and (3) the influence of the use of AI on the quality of learning tools prepared by elementary school teachers. These three focuses are the basis for explaining how AI is accepted, utilized, and influences teachers' professional practices in designing learning.

Table 1. Synthesis of Literature Based on Research Focus

Field/Focus	Writer of a Piece	Insight /Research Variables
Teachers' Perceptions of the Use of AI	(Zhai et al., 2021), (Porayska-Pomsta et al., 2023), (Tlili et al., 2023),	Teachers show a positive perception of AI as a tool for learning and educational administration. Teacher perception, acceptance of technology, attitude towards AI
Benefits and Challenges of Using AI	(Dwivedi et al., 2023), (Wulida Itsnaini et al., 2025), (Lestari et al., 2026)	AI improves work efficiency but presents ethical challenges, information validity, and digital competence. Benefits of AI, AI challenges, digital literacy
The Influence of AI on the Quality of Learning Tools	(Parn et al., 2025), (J. Siregar & Badriah, 2025), (Rizki & Abidin, 2026)	AI helps produce more systematic, innovative, and adaptive learning tools. Quality of learning tools, learning innovation, learning effectiveness

Table 1. The above literature synthesis shows that research on the use of Artificial Intelligence (AI) in education, especially related to teachers, can be grouped into three main focuses. The first focus discusses teachers' perceptions of the use of AI, which includes the acceptance of technology, attitudes, and teachers' views on the use of AI in supporting learning tasks. The second focus examines the benefits and challenges of using AI, with a scope that includes improving work efficiency, support in the preparation of learning tools, as well as various constraints such as ethical aspects, information validity, and digital literacy needs. The third focus examines the influence of AI on the quality of learning tools prepared by teachers, including systematic, innovative, adaptive, and effective aspects of the devices produced. These three focuses show that the study of AI in education not only highlights teachers' acceptance of technology, but also evaluates its impact and implications on the quality of processes and learning planning outcomes.

1. Primary school teachers' perception of the use of AI in the preparation of learning tools

Primary school teachers' perception of the use of *Artificial Intelligence* (AI) in the preparation of learning tools generally shows a positive response. AI is seen as a technology that is able to assist teachers in compiling various learning documents, such as teaching modules, Learning Implementation Plans (RPP), teaching materials, learning media, and assessment instruments faster and more efficiently (Prabowo & Gafur, 2025). The presence of AI makes it easier for teachers to find references, develop creative learning ideas, and adapt the material to the needs of students. In addition, AI also helps reduce the administrative

burden on teachers so that they can focus more on the learning process and student mentoring in the classroom (Purnama et al., 2025).

Teachers' perceptions of the use of AI are also influenced by the various challenges they face. Some teachers still have limitations in mastering digital technology so they cannot make optimal use of AI (Huda, 2024). Concerns about the accuracy of AI-generated information, the potential dependence on technology, and the reduced creativity of teachers in developing learning tools are also concerns (A. M. Siregar et al., 2025). There are still obstacles in the form of limited internet access, lack of training on the use of AI, and the lack of clear guidelines on the use of AI in the educational environment. These factors have led to varying levels of acceptance and use of AI among primary school teachers (Jannah et al., 2026). Elementary school teachers' perception of the use of AI in the preparation of learning tools tends to be positive because AI is able to increase efficiency, productivity, and ease of development of learning tools. The use of AI is still faced with various challenges such as limited digital competence, accuracy of results, and the availability of supporting facilities. continuous training, adequate infrastructure support, and clear policies are needed so that the use of AI can be optimally utilized to support the quality of learning in elementary schools.

2. Benefits and challenges that teachers feel in using AI to develop learning tools

AI helps teachers save time and energy when compiling teaching modules, learning materials, student worksheets, and evaluation instruments. Through AI, teachers can quickly obtain various references and examples of learning tools so that the learning planning process becomes more efficient (Wahyuningsih et al., 2025). AI also supports the development of creative ideas in designing learning activities that are more interesting and in accordance with the characteristics of students. This convenience allows teachers to focus more on the implementation of learning and the development of student competencies (Inovasi et al., 2025). The use of AI also presents a number of challenges for teachers. One of the main challenges is the ability of teachers to operate and utilize AI technology effectively (Cakraningtyas et al., 2025). Not all teachers have the same level of digital literacy, so there are differences in the ability to utilize AI features (Rahmawati et al., 2025).

The results produced by AI are not always in accordance with learning needs, so they still require a verification and adjustment process by teachers. Other challenges include limited internet access, lack of training related to the use of AI, and concerns about potential reliance on technology that can reduce teachers' creativity and independence in developing learning tools (Al Fajar et al., 2026). Based on this description, it can be concluded that AI provides significant benefits in helping teachers develop learning tools faster, more efficiently, and more innovatively. However, the use of AI is also faced with various challenges, such as the limitations of digital competence, the need to verify the results produced by AI, and the availability of adequate supporting facilities. In order for the benefits of AI to be optimally obtained, it is necessary to increase teachers' digital literacy, continuous training, and the judicious use of AI as a tool that supports, not replaces, the professional role of teachers in the learning process.

3. The use of AI affects the quality of learning tools that elementary school teachers compile

Usage *Artificial Intelligence* (AI) has a significant influence on the quality of learning tools prepared by elementary school teachers. AI can help teachers design various components of learning tools such as teaching modules, learning objectives, assessments, learning media, and learning activities that suit the characteristics of students (Naufal et al., 2024). By utilizing AI, teachers can quickly obtain learning references and ideas so that the tools compiled become more systematic, structured, and in accordance with the demands of the applicable curriculum. AI can also help teachers adjust the material to the level of students' ability, so that the learning process becomes more relevant and meaningful (Khasanah et al., 2025). The influence of AI on the quality of learning devices is not always positive if its use is not accompanied by adequate digital literacy skills and teacher professionalism (Tähel et al., 2025). Over-reliance on AI can cause the resulting learning tools to less reflect the real needs of students and the context of the school environment. Some of the results provided by AI also have the potential to contain information that is less accurate or not in accordance with the learning objectives, thus requiring a verification and adjustment process by teachers (Wahyuni et al., 2025). The quality of learning tools remains highly dependent on teachers' ability to evaluate, modify, and integrate AI-generated outcomes into contextual learning practices (Entriza & Puspitasari, 2025).

It can be concluded that the use of AI has an effect on improving the quality of learning tools prepared by elementary school teachers, especially in terms of efficiency, creativity, and completeness of the devices produced. These benefits can only be obtained optimally if teachers are able to use AI wisely, critically, and responsibly. AI should be seen as a tool that supports teacher professionalism, not as a substitute for the role of teachers in designing learning tools that suit the needs and characteristics of students.

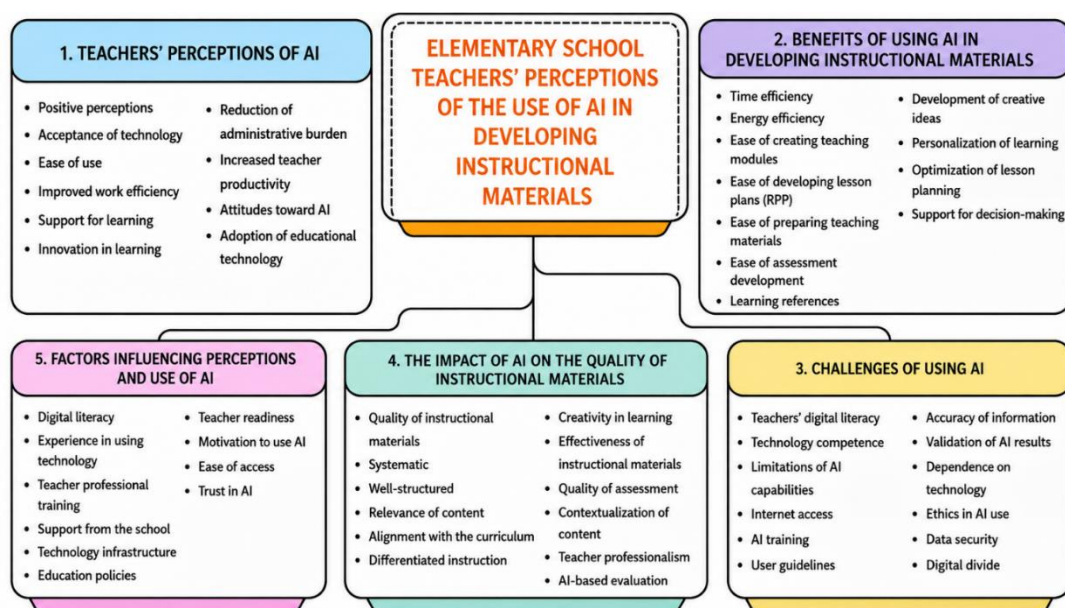


Figure 2. Results of a Literature Synthesis on Elementary School Teachers' Perception of the Use of *Artificial Intelligence* (AI) in the Preparation of Learning Tools

Figure 2. Explaining the perception of elementary school teachers towards the use of *Artificial Intelligence* (AI) in the preparation of learning tools tends to be positive because AI is seen as able to improve work efficiency, facilitate the preparation of teaching modules, lesson plans, teaching materials, assessments, and help reduce the administrative burden on teachers. AI also supports learning innovation through the provision of diverse references, the development of creative ideas, the personalization of learning, and the optimization of learning planning that is more in line with the needs of students. The implementation of AI still faces various challenges such as the low digital literacy of some teachers, limited technology competencies and skills in using AI, uneven internet access, lack of training, and the lack of clear guidelines for the use of AI. There are concerns related to information accuracy, the need for validation of AI results, potential technology dependence, ethical issues, data security, and digital divides. In terms of the quality of learning tools, AI contributes to producing tools that are more systematic, structured, relevant to the material, according to the curriculum, supporting learning differentiation, increasing creativity, device effectiveness, assessment quality, and teachers' ability to contextualize learning materials. The final quality of the learning tools remains dependent on the teacher's professionalism in evaluating and adjusting the results generated by AI. The entire process of accepting and using AI is influenced by various factors such as digital literacy, experience of using technology, professional training, school support, technology infrastructure, education policies, teacher readiness, motivation for using AI, ease of access, and the level of trust in AI so that the success of the use of AI in the preparation of learning tools is not only determined by the technology itself but also by the readiness of human resources and adequate educational environment support.

D. CONCLUSIONS AND SUGGESTIONS

The results of the study conducted through the *Systematic Literature Review* approach show that the use of *Artificial Intelligence* (AI) has brought significant changes in the process of preparing learning tools by elementary school teachers. The presence of AI makes it easier to design teaching modules, teaching materials, assessment instruments, and various other learning components in a more efficient, structured, and innovative manner. In addition to increasing productivity, this technology also opens up opportunities for teachers to develop more adaptive learning strategies according to the characteristics and needs of students. Optimizing the use of AI still faces a number of obstacles, including limited digital competence, unequal access to technological infrastructure, and the need to strengthen understanding related to ethical aspects and the validity of information generated by AI. Teacher capacity building and institutional support are critical factors in encouraging the effective and responsible use of AI in the primary education environment.

The results of this synthesis confirm that the success of AI integration in the preparation of learning tools is not only influenced by the technological capabilities possessed but also by the readiness of human resources, policy support, and the culture of innovation that develops in schools. The proper use of AI can be a means to strengthen teacher professionalism and improve the quality of lesson planning on an ongoing basis. The study of the use of AI by elementary school teachers still needs further in-depth, especially related to the factors that

affect the acceptance rate, utilization patterns, and its impact on the quality of learning tools in various educational contexts. Future research needs to be directed at the development of AI implementation models that are more contextual, ethical, and sustainable so that the technology can be optimally integrated to support the improvement of the quality of basic education.

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