



UTILIZATION OF ARTIFICIAL INTELLIGENCE (AI) AS A SOURCE OF TEACHING MATERIALS FOR TEACHERS: ANALYSIS OF POTENTIAL, CHALLENGES, AND CONTENT ACCURACY

PEMANFAATAN KECERDASAN BUATAN (AI) SEBAGAI SUMBER BAHAN AJAR BAGI GURU : ANALISIS POTENSI, TANTANGAN, DAN AKURASI KONTEN

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Abstract

The development of Artificial Intelligence (AI) technology is currently progressing very rapidly and has had a major influence on various sectors, including the education sector, offering great potential in compiling engaging and relevant teaching materials. However, teachers still face challenges related to limitations in time, energy, technological understanding, and the accuracy of AI-generated content. Findings from the analysis show that AI has a significant capability to support teachers in designing learning materials relevant to student needs, as well as testing the accuracy of AI-generated content related to the learning material. Using a non-participant observation method, data was collected through social media, unstructured interviews with lecturers, teachers, and the general public, as well as testing the content of AI platforms such as ChatGPT, Gemini, and Meta AI. This research uses a descriptive qualitative approach to analyze the data. The study's findings reveal that artificial intelligence has a significant capacity to support educators in designing learning materials, while also optimizing time productivity and teaching innovation. However, the accuracy of AI content, although quite high for basic concepts, often does not include specific sources or references, thus requiring manual verification by teachers. The main challenges include a lack of training and technological understanding. It is recommended that teachers undergo AI training and always verify AI content with trusted sources.

Keywords: Artificial Intelligence, AI, Teaching Materials, Teachers, Content Accuracy, Education.



Abstrak

Perkembangan Teknologi kecerdasan buatan (AI) kini mengalami perkembangan yang sangat cepat dan telah memberikan pengaruh besar di berbagai sektor, termasuk sektor pendidikan, menawarkan potensi besar dalam penyusunan bahan ajar yang menarik dan relevan. Namun, guru masih menghadapi tantangan terkait keterbatasan waktu, tenaga, pemahaman teknologi, dan akurasi konten AI. Temuan dari analisis menunjukkan bahwa AI memiliki kemampuan yang signifikan dalam mendukung guru merancang materi ajar yang relevan dengan kebutuhan siswa, serta menguji akurasi konten yang dihasilkan AI terkait materi pembelajaran. Menggunakan metode observasi non-partisipatif, data dikumpulkan melalui media sosial, wawancara tidak terstruktur dengan dosen, guru, dan masyarakat umum, serta uji konten AI pada platform seperti ChatGPT, Gemini, dan Meta AI. Penelitian ini menggunakan pendekatan kualitatif deskriptif dalam menganalisis data. Temuan studi mengungkapkan bahwa kecerdasan buatan memiliki kapasitas yang signifikan untuk mendukung pendidik dalam merancang materi pembelajaran, sekaligus mengoptimalkan produktivitas waktu dan inovasi pengajaran. Namun, akurasi konten AI, meskipun cukup tinggi untuk konsep dasar, seringkali tidak menyertakan sumber atau referensi spesifik, sehingga memerlukan verifikasi manual oleh guru. Tantangan utama meliputi kurangnya pelatihan dan pemahaman teknologi. Disarankan agar guru mengikuti pelatihan AI dan selalu memverifikasi konten AI dengan sumber terpercaya.

Kata Kunci: Kecerdasan Buatan, AI, Bahan Ajar, Guru, Akurasi Konten, Pendidikan.

1. INTRODUCTION

The advancement of artificial intelligence (AI) technology has had a significant impact on various aspects of human life, including the field of education. AI plays a vital role in creating more diverse and in-depth learning content while also designing adaptive learning experiences that foster active student interaction (Rusdiana & AR, 2024). According to Anas (2024), artificial intelligence can provide support for a more human-centered education system that responds to the uniqueness of each learner and optimizes learning experiences according to their individual abilities and interests. AI technology enables teachers to develop learning materials that are more interactive, personalized, and tailored to the diverse needs of their students.

On the other hand, many educators face difficulties in developing up-to-date and contextual learning materials due to time constraints, limited resources, and a lack of technological proficiency (Erlita et al., 2024). As Andhany (2024) points out, teachers need specific competencies to use AI appropriately in order to enhance the quality of teaching and learning. The optimal use of AI chatbots as companions in the learning process has been shown to increase students' motivation to learn, which in turn positively affects their academic performance (Inovasi et al., 2024).

The application of artificial intelligence in education has contributed to improvements in both the effectiveness and quality of learning processes across various educational levels. By integrating modern educational theories within the Merdeka Curriculum, learning can be personalized according to each student's preferences and learning styles, encouraging students



to become more independent while providing timely and contextually relevant feedback (Respati et al., 2024). Furthermore, AI enables the development of systems that can not only process and analyze complex information but also adapt learning processes dynamically to meet the unique needs of each learner (Gilang Akbar, 2024).

The use of artificial intelligence in adaptive and personalized learning allows for the design of learning strategies that align with each student's individual needs, making the learning process more effective and efficient (Rifky, 2024). However, the integration of AI in education also raises concerns regarding the accuracy of AI-generated content. Several studies have found that although AI can produce information rapidly, not all of the generated content meets academic standards or includes reliable references. Therefore, it is essential to conduct in-depth analyses of the potential, challenges, and accuracy of AI-generated educational materials, ensuring that they meet both pedagogical and academic quality standards.

2. RESEARCH METHOD

2.1 Research Method

This study falls into the category of **non-participatory observational research**, in which the researcher observes the research object or subject without directly engaging in their activities. The researcher acts as an external observer to maintain data objectivity.

2.2 Time and Place of Implementation

- **Research Location:** The research was conducted in the urban area of Medan, which served as the setting for the study.
- **Time Frame:** The research process took place from May to July 2025, specifically from May 6 to July 10, 2025.

2.3 Data Collection Sites

The data were collected from various sources, including:

- **Social media** platforms such as Twitter, Facebook, and teacher forums to gather opinions and user experiences regarding AI in education.
- **Unstructured interviews** with lecturers, teachers, and the general public to obtain diverse perspectives on the use of AI.
- **AI content testing** by submitting educational questions to AI platforms such as ChatGPT, Gemini, and Meta AI.

2.4 Data Collection Methods

The methods used to collect data in this research included:

- **Observation:** Monitoring online discussions about the use of AI in education.
- **Documentation:** Recording respondents' statements and AI content results.



- **Interviews:** Conducting unstructured interviews to explore participants' experiences in depth.

2.5 Data Analysis Procedure

Data were analyzed using a descriptive qualitative approach through the following stages:

1. **Data Screening**
Selecting and sorting key information obtained from observations of social media discussions, interview excerpts, and AI-generated content.
2. **Data Presentation**
Organizing the results of the analysis in narrative form and thematic tables for readability and comparison.
3. **Verification**
Conducting data triangulation across three primary sources (social media, interviews, and AI responses) using scholarly references to ensure accuracy and consistency.
4. **AI Content Accuracy Test**
Conducted through three main stages:
 - Submitting **five questions** related to common teaching materials (e.g., types of learning media, learning theories, online learning definitions, and basic math problems).
 - Comparing AI responses with textbooks, scholarly journals, and the official curriculum.
 - Classifying AI responses into categories:
 - **Accurate:** Content is complete and consistent with scholarly references.
 - **Partially Accurate:** Only part of the information is correct or the response is incomplete.
 - **Inaccurate:** Information is incorrect or deviates from academic references.
5. **Accuracy Assessment**

To systematically measure how accurate the AI responses are, a weighted scoring model was applied based on three main components:

Table 1. Assessment Criteria



Component	Weight	Assessment Description
Factual Accuracy	50%	How accurate the facts provided by AI are compared to scholarly sources
Content Completeness	30%	Whether the information covers all key points or only partial details
Citation/Source	20%	Whether AI mentions scholars, books, or journal references

Example Assessment:

Question: “What are the types of instructional media according to experts?”

Table 2. Example of Assessment

Component	Assessment Explanation	Raw Score	Weight	Score Weight	×
Factual Accuracy	AI mentioned 4 out of 5 types of instructional media (Visual, Audio, Audio-Visual, Multimedia – missing “Realia”)	80	0.5	40	
Content Completeness	Covers most of the key points (4 out of 5) but lacks definitions for each type	80	0.3	24	
Citation/Source	Does not mention scholars such as Heinich or Smaldino, or other explicit references	0	0.2	0	
Total Score				64%	
Category				Partially Accurate	

3. RESULTS AND DISCUSSION**3.1 Research Results****1. Lecturers’ and Teachers’ Perceptions of AI**

- Most lecturers and teachers agree that AI tools such as ChatGPT can be used as learning aids but not for examinations.
 Example interview quote:
 “AI is very helpful in preparing learning materials, but for student evaluation, we still rely on manual assessment.” (Teacher A)
- According to an IT lecturer:
 “Using AI is fine for developing teaching frameworks, but not for creating full learning materials.” (Roberto, via Instagram)
- Another respondent stated:
 “AI can serve as a source of inspiration, not as the only reference. The output from AI must be verified and compared with credible academic sources.” (Rusbiansyah, via Instagram)
- A teacher noted:



“AI is useful for simplifying work, for comparison, for building conceptual frameworks, and for various other efficiencies — but it should not be used merely for copy-paste and presentation.” (Teacher Stevanus, via Instagram)

2. Teachers' Experience in Using AI

- Teachers who have used AI reported a significant increase in efficiency when preparing learning materials.
“Using AI helps shorten the preparation time, speeds up the work, and provides inspiration.” (Magnate, via Instagram)
- However, the main challenges identified include the lack of training and the **inaccuracy** of certain AI-generated content.

3. AI Content Accuracy Test

The following table presents the results of the AI content accuracy test based on five question topics.

Table 3. AI Content Accuracy Test

No	Question	Topic	AI Platform	Journal Source	AI Accuracy	Score (%)	Strengths	Weaknesses
1	Types of instructional media	Instructional Media	ChatGPT	AI for Teachers Journal (2025)	Accurate	90%	Provides clear overview	Does not mention experts' names
2	Definition of online learning	Online Learning	Meta AI	AI for Teachers Journal (2025)	Accurate	85%	Gives practical definition	^a Lacks citation of scholars
3	Cognitive learning theory	Learning Theory	Gemini	AI Scopus (2022)	⁺ Partially Accurate	75%	Explains core theory	Lacks complete expert list
4	AI and higher education assessment	Assessment & GenAI	ChatGPT	Nature (2024)	Accurate	88%	Explains current trends	Lacks risk exploration
5	Math problem $f(x)=2x^2-3x+5$	Mathematics	DeepSeek	MDPI Merdeka Curriculum	⁺ Partially Accurate	70%	Performs fast calculations	Misuses terms like “convex/concave”

3.2 Discussion

1. AI Content Accuracy

AI demonstrates a relatively high degree of accuracy for basic concepts and factual questions, such as “types of instructional media” and “definition of online learning.” However, it often fails to include specific academic sources or the names of recognized experts. For example, AI responses about “types of instructional media” align with existing literature but lack detailed expert references. Similarly, in “cognitive learning theory,” the main ideas



were correctly explained but the theorists' names were not fully mentioned. For more complex analytical questions such as "How does generative AI change assessment in higher education?" AI successfully identifies current trends but does not sufficiently address the potential risks involved. In mathematics, AI performs calculations accurately but sometimes misinterprets technical terms (e.g., "convex" vs. "concave"), indicating that while AI can handle computation efficiently, conceptual understanding still requires human verification.

2. Benefits of AI for Teachers

AI offers several advantages for teachers in classroom practice:

- **Time Efficiency:** AI significantly accelerates the process of preparing teaching materials and reduces teachers' workload in collecting and summarizing information (Gagaramusu et al., 2025).
- **Creativity Enhancement:** AI enables teachers to produce more varied and engaging content (texts, visuals, and exercises), making learning more dynamic and interactive.

3. Challenges and Solutions

- **Challenges:** Teachers' limited technological proficiency and issues with AI-generated content accuracy remain major obstacles. The lack of comprehensive training further hinders effective implementation (Puspita et al., 2023).
- **Solutions:** Teachers should manually verify AI-generated content using reliable references to ensure accuracy and depth. Additionally, comprehensive AI literacy training is crucial for improving teachers' competencies in integrating AI into educational practice (Taufik & Rindaningsih, 2024).

4. CONCLUSION

4.1 Conclusion

1. AI has great potential as a supportive tool for teachers in preparing learning materials, enhancing both efficiency and creativity. However, it cannot replace the teacher's role entirely, particularly in critical evaluation and deep understanding.
2. AI-generated content is reasonably accurate for general and foundational topics but still requires manual verification, especially for content that demands academic rigor, specific references, or complex analysis.

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