The Urgency of Developing an AI-Based Website to Facilitate Teachers to Create Teaching Modules

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Abstract
The rapid development of digital technology demands innovation in the field of education, including the utilization of artificial intelligence (AI) to help teachers simplify administrative tasks and enhance the quality of relevant and creative learning. Teachers' ability to create quality teaching modules is a crucial aspect of improving learning outcomes. This study aims to describe the urgency of developing an AI-based website that can facilitate teachers in creating teaching modules effectively and efficiently. The research employs a descriptive qualitative method, with the subjects being participants of a training program titled Differentiated Teaching Module Development in Science Subjects at e-Guru.id, consisting of 150 participants. Data were collected through in-depth interviews and observations of technology use in the process of creating teaching modules. Data analysis was conducted in four stages: (1) organizing data, (2) analyzing data, (3) presenting research findings, and (4) discussing research findings. The results indicate the urgency of developing an AI-based platform to assist teachers in creating teaching modules more effectively and efficiently. Most training participants at e-Guru.id found the intuitive and personalized AI features helpful, though a small number faced technical challenges and lacked knowledge about AI. These findings underscore the need for additional training to optimize AI utilization in supporting the learning process.This study reaffirms the importance of developing an AI-based website that supports teachers in efficiently creating teaching modules, enabling them to focus more on the creative aspects of learning through automation and personalization features.
Keywords: artificial intelligence, website, teaching module, teacher,

Abstrak
Pesatnya perkembangan teknologi digital menuntut inovasi dalam dunia pendidikan, termasuk pemanfaatan kecerdasan buatan (AI) untuk membantu guru menyederhanakan tugas administratif dan meningkatkan kualitas pembelajaran yang relevan dan kreatif. Kemampuan guru dalam menyusun modul ajar yang berkualitas menjadi salah satu aspek penting dalam peningkatan mutu pembelajaran. penelitian ini bertujuan untuk mendeskripsikan urgensi pengembangan website berbasis AI yang dapat memfasilitasi guru dalam membuat modul ajar secara efektif dan efisien. Penelitian ini menggunakan metode kualitatif deskriptif. Subjek penelitian ini adalah peserta Pendidikan dan Pelatihan berjudul Penyusunan Modul Ajar Berdiferensiasi pada maja Pelajaran IPA di e-Guru.id dengan jumlah peserta sebanyak 150 peserta. Data dikumpulkan melalui wawancara mendalam dan observasi terhadap penggunaan teknologi dalam proses pembuatan modul ajar.Analisis data dilakukan dengan empat tahap yaitu , (1) mengorganisasikan data, (2) melakukan analisis data, (3) menyatakan temuan penelitian, dan (4) melakukan pembahasan terhadap penemuan penelitian. Hasil penelitian ini di temukan urgensi pengembangan platform berbasis kecerdasan buatan (AI) untuk mempermudah guru dalam menyusun modul ajar secara efektif dan efisien. Mayoritas peserta pelatihan di e-Guru.id merasa terbantu dengan fitur AI yang intuitif dan personalisasi, meskipun sebagian kecil menghadapi kendala teknis dan kurangnya pengetahuan tentang AI. Temuan ini menegaskan perlunya pelatihan tambahan untuk meningkatkan pemanfaatan AI dalam mendukung proses pembelajaran.. Penelitian ini menegaskan urgensi pengembangan website berbasis AI yang mendukung guru dalam menyusun modul ajar secara efisien, memungkinkan fokus lebih pada aspek kreatif pembelajaran melalui fitur otomatisasi dan personalisasi.
Kata kunci: Kecerdasan buatan, website, modul ajar, guru.

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INTRODUCTION

In the era of Industrial Revolution 4.0, information and communication technology (ICT) has changed various aspects of life, including education. The role of teachers as learning facilitators is now increasingly complex, demanding the ability to design teaching modules that are relevant, interactive, and in accordance with technological developments. Previous research revealed that many teachers in Indonesia still face difficulties in developing effective teaching modules due to limited knowledge and skills in using digital technology (Kurniawati, 2021). Therefore, an innovative solution is needed that can help teachers in the process of preparing learning materials.

In the field, many teachers have not been able to optimize digital technology in making teaching modules. Based on observations and interviews with several teachers in rural areas, it was found that limited access to technological devices, low digital literacy, and lack of adequate training made it difficult for teachers to utilize technology optimally in learning. This condition is exacerbated by the demands of an increasingly dynamic curriculum that requires faster and more accurate adjustment of learning materials (Suhendar & Agustina, 2022). In addition, the administrative burden of teachers, including making lesson plans, evaluation reports, and developing teaching modules, is a challenge for teachers in managing their time and energy (Rahmawati, 2020).

The urgency of artificial intelligence (AI) in education is increasingly felt, especially in supporting the efficiency of teachers' administrative work. AI can help teachers with administrative tasks such as preparing teaching modules, processing learning outcomes data, and creating evaluation reports. This is important because the administrative burden often reduces the time that teachers can use to interact directly with students or deepen their mastery of learning materials (Wahyuni et al., 2020). With AI, the process of automating the creation of teaching modules can be done faster, allowing teachers to focus on pedagogical aspects and developing creativity in designing more interactive and interesting learning (Suryani & Nugraha, 2019). Furthermore, in research on artificial intelligence by Setyaningrum, Vidya, et al. (2023) who examined the Development of AI-Based Chatbot in Learning revealed that the use of AI technology, including chatbots, contributed greatly to the learning process in higher education. This finding indicates the potential for AI to also be applied in the development of teaching modules at lower education levels.

In addition, AI-based websites also offer personalization features that allow teachers to create teaching modules tailored to the needs and abilities of learners. This technology can provide teaching material recommendations based on student data analysis, so that the resulting modules are more relevant and effective in supporting the learning process (Saputra & Hidayat, 2021). Thus, the development of AI-based websites is not only a solution to technical problems, but also a strategic step to improve the effectiveness and efficiency of teacher performance in managing their workload.

The urgency of developing an Artificial Intelligence (AI)-based website in improving teachers' ability to create teaching modules is very relevant, especially in the context of technological development and the need to improve the quality of education. Along with the implementation of the Merdeka Curriculum and the digitalization of education, teachers are required to be more creative and independent in developing

teaching materials that suit the needs of students. However, many teachers still face challenges in developing effective and interesting teaching modules. Based on research conducted by (A. O. Okonkwo & O. D. Ogbuanya, 2018) in South Africa, the use of artificial intelligence (AI)-based technology is proven to assist teachers in designing more innovative and effective teaching materials, especially in learning contexts that require a creative approach. The results showed that teachers who used AI-based applications were better able to adapt teaching materials to the individual needs of students, thus creating a more student-centered learning experience. Another study by (S. A. Yusoff, et al, 2019) in Malaysia also showed that the use of AI in education helps teachers accelerate the learning planning process, including in designing interesting and interactive curriculum and teaching modules. Teachers find it helpful to prepare teaching materials more efficiently, reduce administrative burden, and have more time to focus on pedagogical aspects.

This research is very important because it presents an AI technology-based solution that can help teachers develop teaching modules more easily, quickly, and efficiently. This research aims to describe the urgency of developing an AI-based website that can facilitate teachers in creating teaching modules effectively and efficiently. The AI-based website developed can provide support in terms of content structuring, material development suggestions, and provide templates that can be adapted by teachers according to curriculum needs and learner abilities. It also allows teachers to utiliz e AI technology in creating more interactive and personalized teaching materials.

METHODS

This research uses a qualitative research approach. Qualitative research is conducted to explore and understand the meaning that a number of individuals or groups of people perceive as originating from social or human problems (Creswell, 2009:4). This study employs a descriptive qualitative approach to describe the urgency of developing an artificial intelligence (AI)-based website to effectively and efficiently support teachers in creating teaching modules. This method was chosen to delve deeply into the experiences and perspectives of the research subjects regarding the use of AI technology in the teaching module creation process.

The research was conducted over one month, from September to October 2024. The subjects of this study consisted of 150 participants of the teaching module training at e-Guru.id (Semarang), held online via Zoom meetings. The data collection techniques began with observation to analyze the research data needs. Subsequently, the researcher distributed questionnaires, conducted in-depth interviews, and processed the research data, the results of which were presented descriptively.

According to Creswell (2008: 243-270), qualitative data analysis techniques can be carried out in four stages: (1) organizing the data, (2) analyzing the data, (3) presenting the research findings, and (4) discussing the research findings. Organizing the data was done using two research instruments: a questionnaire and an interview guide. Data analysis in this study was conducted to filter or select data focused on key findings obtained in the field. Presenting the research findings involved displaying descriptive data from the distributed questionnaire results. The next stage was discussing the research findings, which is the final step to answer how urgent the use of AI technology is in facilitating teachers in creating teaching modules.

The instrument used was a questionnaire consisting of 2 indicators spread across 15 questions. These indicators focused on teachers' responses to utilizing artificial intelligence (AI) technology and the types of AI used in teaching. An expert validator consulted on the validity of the research instruments before the questionnaires were distributed to the research subjects.

RESULTS AND DISCUSSION

Results

This research was conducted at one of the online training platforms called e-Guru.id in Semarang, Central Java Province. The results showed that there is an urgent need for the use of Artificial Intelligence (AI) technology in today's digital era, especially for teachers in helping to complete teacher administrative tasks, one of which is teaching modules. Artificial intelligence (AI) is very relevant and important in supporting teaching effectiveness in the midst of rapid technological development. With the ability to automate administrative tasks, AI helps teachers save time and effort, so they can focus more on a more creative and interactive learning process.

Through this approach, the urgency of developing an artificial intelligence (AI)-based website to facilitate teachers in creating teaching modules. From the results of data collection through questionnaires distributed to 150 teachers who participated in training at e-Guru.id, it was found that the majority of teachers felt significant benefits from using AI-based websites in the preparation of teaching modules. The results of the questionnaire show in Figure 1 that 54% of training and education participants with the title Differentiated Teaching Module Preparation in Science Subjects in e-Guru.id that AI-based website technology can be useful in assisting the preparation of teaching modules while 43.3% of participants stated that AI features that can be personalized greatly support specific needs in the development of learning content. And 2.7% of trainees have not used artificial intelligence to create teaching modules in their learning.

Data regarding the type of is presented in Figure 2 below. In the figure, it is known that the use of artificial intelligence used by teachers using Quiz AI which can be used to create AI-based online quizzes has the least amount of 12% (18 people). Then the use by teachers using SlideAI obtained 21.3% (32 people). Then followed by the use of classpointAI 26% (39 people). Meanwhile, the use of GeminiAI by teachers has the highest number, namely 38% (57 people) and other results 0.7% (1 person) have not tried artificial intelligence, 0.7% (1 person) other teachers are not familiar with AI.

Interviews with the trainees revealed several factors influencing the selection of the type of artificial intelligence (AI) in creating teaching modules. Most of the teachers who chose GeminiAI (38%) stated that the platform offers intuitive features and supports the creation of interactive and relevant learning content, making them feel more confident in developing teaching modules. Teachers using ClasspointAI (26%) revealed that the app helps them add interactive elements to presentations, which they feel is very supportive in attracting students' attention and making it easier to understand complex concepts.

Meanwhile, SlideAI users (21.3%) felt that the platform was effective in speeding up the visual design process of learning materials, making them more visually appealing and making it easier for students to absorb information. For Quizizz AI

(12%), teachers who use this platform mentioned that the AI-based quiz feature helps them create evaluations quickly and automatically, but since quizzes only cover the assessment aspect and not the whole module preparation, the number of users is smaller compared to other AI platforms. Interview results also showed that some teachers (0.7%) have not tried AI in module development due to limited knowledge and access to this technology, while another 0.7% claimed to be unfamiliar with AI technology in general, suggesting a need for additional training and mentoring in AI technology for teachers.

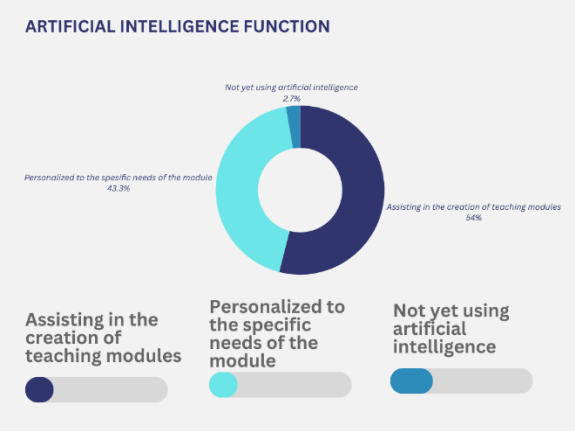

Figure 1 Artificial Intelligence Function

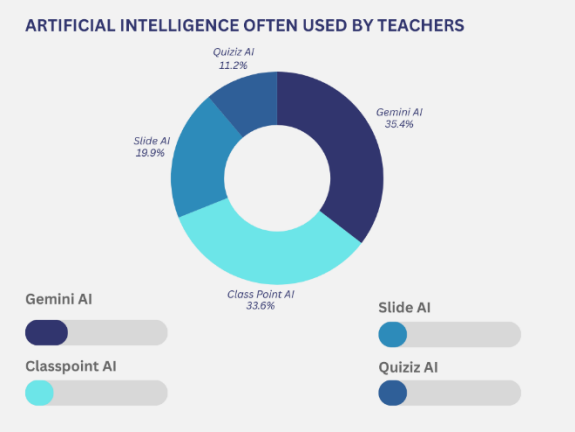

Figure 2 Artificial Intelligence used by Teacher

In Figure 3, it shows that 58% (87) of training and education participants with the title Differentiated Teaching Module Preparation in Science Subjects use websites in utilizing AI because it increases the effectiveness of working time on teaching modules. Then 42% (63) people use applications in the utilization of AI to support the learning process. Then followed by 42% using smartphones for AI utilization. And 40% manually with the guided method by the training instructor. Other results 1.3% (2 people) did not make teaching modules, and 0.7% of trainees still have difficulties in operating technology, especially artificial intelligence.

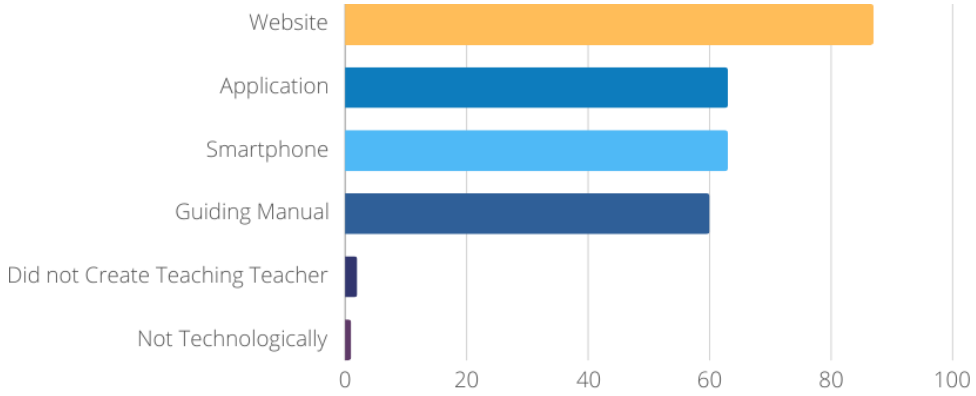

Figure 3 Software usage on AI utilization

Additional results from this research through interviews via zoom meeting that the majority of trainees in e-Guru.id found the simple interface and clear usage guidelines in the AI-based platform helpful, making it easier for them to develop teaching modules. Around 65% of participants stated that AI was easy to access, although 15% of them faced technical constraints, such as limited internet and devices, especially for those in remote areas. The level of technology experience also had a significant effect; teachers who were already familiar with digital applications found it easier to adapt to AI, while those who were new to it required additional training. As many as 80% of participants found AI's personalization features very useful in developing teaching modules that are relevant to students' needs, providing content recommendations that match students' level of understanding, and adding creativity to the presentation of material. However, 10% of participants were still skeptical about the accuracy of AI in producing curriculum-appropriate materials.

DISCUSSION

The ability to create teaching modules is one of the important competencies that must be possessed by teachers and educators. Teaching modules are learning tools that guide the teaching and learning process, and have a strategic function in achieving educational goals. In the era of rapid technological development at this time teachers need to adapt to technological advances that are increasingly massive in their application in the world of education. Artificial Intelligence (AI) is now rapidly growing in the world of education, bringing significant innovation in the way teaching and learning. AI technology enables more personalized and adaptive learning, facilitating the analysis of student needs, and providing recommendations for teaching materials that match individual abilities and learning styles. (Hwang and Chang, 2021) found that the use of AI tools can help teaching staff complete tasks faster, while (Zawacki-Richter et al. 2019) showed that AI can reduce administrative burden, allowing teachers to focus more on learning.

This study shows that the majority of teachers feel significant benefits from the use of artificial intelligence (AI) in improving the efficiency and effectiveness of teaching module preparation. This finding is consistent with the results of a study by Vidya Setyaningrum et al. (2024), who highlighted the role of AI in supporting learning that is more relevant and targeted to student needs, as well as helping teachers organize content more quickly and accurately. In addition, Rahimah (2021/2022) emphasized

that technology accelerates teachers' ability to develop modules independently, which usually requires intensive assistance. Rahimah found that with the automation feature on AI-based platforms, teachers can independently and effectively develop materials without having to rely entirely on manual assistance. In e-Guru.id, as many as 43.3% of trainees stated that the personalization of AI features greatly supported the preparation of relevant learning content, especially for content related to core learning activities. Furthermore, this study supports the findings of Rahimah (2021/2022), which states that technological assistance can accelerate teacher adaptation in developing teaching modules independently. With the automation features in the AI-based website, teachers are more assisted in the learning process which previously required a long mentoring time. The results of the research that have been conducted as many as 43.3% of participants stated that AI features that can be personalized greatly support specific needs in developing learning content, especially in fulfilling the content of core activities in making teaching modules.Integrasi AI dalam pendidikan juga mengacu pada penelitian (Wahjusaputri et al.,2022) di mana penggunaan AI secara signifikan memperbaiki sistem pembelajaran yang terstruktur dan sistematis, terutama di lingkungan vokasional. Dalam konteks penelitian ini, guru-guru yang mengikuti pelatihan di e-Guru.id merasakan dampak serupa dalam peningkatan kerapian penyusunan modul ajar.

The study by (Rizal, 2023) highlighted that AI features can also provide contextual recommendations that support teachers' creativity in developing modules, so that they are suitable for educational conditions in Indonesia. In addition, the study by (Anderson and Wason, 2023) shows that web-based AI provides personalization capabilities that are very important in the context of education, as it is able to tailor materials according to the specific needs of students, which has a positive impact on learning outcomes. In line with the researcher's results, it can be seen in Figure 3 that 58% (87 people participating in training and education with the title Preparation of Differentiated Teaching Modules in Science Subjects use the website in the utilization of AI because it increases the effectiveness of working time on teaching modules. The results of this study are also related to a study by (Mustafa and Saleh, 2023), which found that AI helps teachers save time in the preparation of lesson materials, which then allows them to focus more on improving interaction and teaching quality. This is in line with the results of the study which revealed that SlideAI (21.3%) that this platform is effective for accelerating the visual design process of learning materials, making them more visually appealing and making it easier for students to absorb information.

In addition, research by (Kim and Zhang, 2022) revealed that the use of AI in learning increases students' active participation as the material is more relevant and structured according to their learning style. This is also supported by a study by (Lee and Poon, 2023) which showed that AI increases flexibility in curriculum preparation at various levels of education, allowing teachers to easily modify and customize modules based on students' level of understanding. On the other hand, (Santos, 2020) noted that although AI technology brings many benefits, there are still a small number of users who experience technical difficulties in its operation. Overall, the findings support that AI technology plays an important role in helping educators increase productivity and creativity in developing teaching materials, while considering the need for additional training for users who experience difficulties. This was found in the results of research on interviews conducted to trainees revealed that 15% of them faced

technical obstacles, such as limited internet and devices, especially for those in remote areas.

CONCLUSIONS

The results of this study confirm the urgency of developing an artificial intelligence (AI)-based website as a tool for teachers in developing teaching modules. Research results on e-Guru.id show that the use of AI technology not only improves the efficiency and effectiveness of the teaching process, but also allows teachers to focus more on the creative aspects of learning. With the automation and personalization features offered by AI-based platforms, teachers can simplify administrative tasks and produce learning content that is more relevant to students' needs. This finding is in line with previous research, which shows that AI technology can accelerate teachers' adaptation in developing teaching modules independently.

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