Utilization of Artificial Intelligence (AI) in Learning: In-House Training for Teachers at SMAN 3 Kota Bengkulu, Indonesia

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Abstract

The In-House Training (IHT) for SMA 3 Bengkulu City teachers aims to improve teachers' skills in utilizing Artificial Intelligence (AI) technology in the learning process. Along with the rapid development of technology, especially in education, the application of AI is expected to enrich the teaching and learning experience and support learning effectiveness. This activity includes the introduction of AI for education, the usage of various AI tools in developing teaching modules, presentations, mind maps, learning videos, and assessments. This training involved more than 80 teachers from various subjects and was tutored by three instructors from Universitas Bengkulu, Universitas Muhammadiyah Bengkulu, and STIKES Bakti Husada Bengkulu. In addition, an evaluation of the quality of training was carried out through a questionnaire that measured respondents' responses on materials, facilities, delivery, and application of AI in teaching. The results of the data analysis showed that the majority of participants were satisfied with the material provided, with the highest average score on an aspect of material attraction, namely 4.58. However, some areas that need improvement include the provided facilities and time for practice activities. The implication of these findings is the importance of improving training facilities and time so that teachers are better prepared to implement AI technology in learning. This training program has made a significant contribution in preparing teachers to deal with educational challenges in today's digital era.

A. Introduction

Many aspects of the education industry have undergone significant change as a result of the current rapid technological advancements, particularly in the context of digital learning. The incorporation of digital tools and platforms, which can enhance the teaching and learning process at all educational levels, from primary to university, is primarily responsible for this shift. Educational institutions must be able to innovate and adapt to the present Industrial Revolution 4.0 and make sure that teachers and students master the digital

skills they need to succeed in a technologically advanced environment (Amrinada et al., 2022). As a key element of education in the twenty-first century, digital literacy acts as a catalyst to improve the efficiency of the teaching and learning process. In order to enhance student learning through a range of pedagogical tools that support both online and in-person instruction, educational institutions must embrace digital technology (Reddy et al., 2021). This change has a possibility to improve student engagement while also equipping students with digital skills they will need in the demanding workplace of the future. For instance, it has been demonstrated that using digital technology in English reading lessons makes learning more dynamic and interesting. It also gives students access to a wealth of tools and direct feedback that may not be available through conventional means (Astri et al., 2024).

A blended learning paradigm, which blends online and in-person instruction, has emerged as a result of the incorporation of digital resources into education. Because it enables a more individualized learning experience, this strategy effectively promotes student motivation and engagement (Dancsa et al., 2023). Digital learning materials have been found to increase students' excitement and engagement in their studies, which is important for academic performance (Ajagbe, 2021). However, there are still issues that can prevent these technologies from being used effectively, such as the disparity in digital literacy between teachers and students (Maziane et al., 2023). It is impossible to overestimate the importance of teachers in this digital revolution. To correctly and successfully incorporate technology into their teaching methods, teachers in this situation must be able to develop their Technology Pedagogical Content Knowledge (TPACK) (Saadé et al., 2023). This involves being aware of how to use digital tools to achieve instructional objectives and enhance student performance. According to research, teachers who are adept at using digital resources can improve student happiness and learning performance by establishing a more dynamic and productive learning environment (Pagels et al., 2024).

AI technology is also transforming scoring systems, among other things. It is frequently believed that traditional assessment methods fall short of accurately capturing pupils' talents. AI can automate tests and give students more insightful evaluations; this is especially useful in fields like medical education, where competency-based tests are crucial (Boscardin et al., 2024). Additionally, by examining data on student performance and engagement, AI systems can help teachers create more successful teaching methods or techniques (Rui & Badarch, 2022). Continuous improvement in teaching methods is made possible by this data-driven approach, which eventually improves student learning results. AI integration in education is not without its difficulties, though. To guarantee fair access and results for all students, a number of issues, including ethical concerns about the application of AI, such as data privacy, bias in the algorithms that are brought up, and the possibility of excessive reliance on technology, should be addressed (Holmes et al., 2022). To successfully manage these hurdles, teachers need to possess a broad range of knowledge and abilities. To ensure that educators can use these technologies responsibly and to promote a favorable attitude toward AI integration, professional development programs that emphasize AI literacy for teachers are crucial (Nasir et al., 2024).

Because AI technology is developing so quickly, more research is needed to determine how it may affect educational policies and practices. In order to fully utilize AI's potential to enhance teaching and learning, educational institutions must continue to be flexible and receptive to these developments as AI develops (Qin & Ao, 2023). This flexibility will be essential in preparing students for a future in which artificial intelligence (AI) becomes more and more integrated into many facets of life and the workplace. Artificial intelligence (AI) in high school education is expanding quickly, offering both benefits and problems to both teachers and students. Numerous facets of the educational process, such as individualized instruction, administrative effectiveness, and enhanced participation through interactive tools, are incorporating AI technology.

One of the most significant advantages of AI at the secondary education level, particularly in senior high school, is its capacity to facilitate personalized learning experiences. AI-based platforms can analyze student performance data to tailor educational content to individual learning needs, thereby improving student engagement and academic success (Dimitriadou & Lanitis, 2023). For example, AI chatbots have been shown to positively impact student engagement by providing live feedback and support, allowing students to reinforce their understanding of concepts at their own pace (Pimentel et al., 2024). This is in line with findings that show a generally positive perception of AI chatbots among high school students, who appreciate the technology's ability to help their academic endeavors (Sanusi et al., 2023). AI technology can serve as a valuable teaching assistant, supporting educators in their instructional practice. Research shows that teachers and students find AI-assisted education platforms beneficial for improving teaching and learning (Niu et al., 2022). The platform can automate administrative tasks, such as grading

and attendance tracking, allowing teachers to focus more on teaching and student interaction (Wulandari et al., 2024). The integration of AI in educational environments not only streamlines operations but also empowers teachers to adopt innovative teaching strategies that promote active learning (Ramalingam & Maniam, 2024).

It is crucial that high school teachers receive training on how to use artificial intelligence (AI) to support the learning process. Teachers need to have the skills and knowledge needed to use AI technology effectively in order to improve student learning outcomes as it becomes more and more incorporated into educational settings. To ensure that teachers can successfully use AI in the classroom and to promote a good attitude toward technology integration, professional development programs that emphasize AI competencies are crucial. The quick development of educational technology is one of the primary causes of the demand for AI training for educators. AI can improve student engagement and learning results by automating administrative work, personalizing learning experiences, and giving students real-time feedback (Yusuf et al., 2023). Teachers must first gain a thorough understanding of AI technology and its educational applications before they may benefit from these advantages. According to research, focused professional development initiatives can greatly enhance teachers' attitudes and preparedness for integrating AI, closing the perceived divide between educators with different degrees of experience (Palupi & Prasetya, 2022).

Additionally, training programs should emphasize hands-on experience with AI tools and practical applications in the classroom. Research has shown that practice-oriented training fosters positive attitudes and increases the likelihood of technology adoption in teaching (Boscardin et al., 2024). By engaging in collaborative learning experiences and sharing best practices, teachers can improve their AI literacy and develop innovative instructional strategies that incorporate AI into their teaching (Krakowski et al., 2022). This collaborative approach not only fosters professional growth but also fosters a culture of continuous learning among educators.

In addition to addressing the ethical issues surrounding the use of AI in education, training programs can help teachers become more technically proficient. It is critical for educators to be well aware of the difficulties around data privacy, bias, and automation consequences that are brought up by AI technology (Ajagbe, 2021). Teachers who receive training that covers the ethical ramifications of AI are better equipped to integrate technology into their lessons and encourage students to think critically about how to utilize AI responsibly.

Furthermore, the Technological Pedagogical Content Knowledge (TPACK) framework, which highlights the necessity for teachers to acquire both pedagogical and technological abilities, aligns with the integration of AI in education (Saputra et al., 2024). Teachers will be able to smoothly integrate AI into their teaching methods thanks to this continuous professional development that focuses on enhancing competencies, which will ultimately improve student learning outcomes. According to research, teachers who possess a high degree of AI literacy are better able to modify their teaching methods to accommodate the various demands of their pupils (Lu et al., 2021). With the quick advancement of information and communication technologies, particularly artificial intelligence (AI), the significance of technology training for educators is coming into sharper focus. Teachers, who play a central role in education, must be able to integrate technology into the teaching and learning process in addition to possessing extensive academic knowledge. AI in particular can offer creative answers to a number of educational problems, including more engaged and motivated students, more efficient classroom management, and personalized learning. In order to fully utilize AI's potential in educational activities, it is crucial that educators continue to advance their technological proficiency through proper training.

In-house Training (IHT) is one of the most efficient ways to support high school teachers' training activities. In order to make training more available to teachers without requiring them to take time away from their everyday responsibilities, IHT is a training activity that enables training to be conducted directly in the school setting. Teachers can learn realistically and immediately apply the knowledge they acquire in their everyday learning activities by using training resources that are customized to local needs and settings. Furthermore, IHT makes it easier for participants and facilitators to communicate directly, enabling deeper conversations and offering answers to problems teachers have in the classroom.

B. Methods

The purpose of this community service project is to provide SMAN 3 Kota Bengkulu teachers information on how to apply artificial intelligence (AI) in the classroom. The event was held on February 26, 2024, at SMAN 3 Kota Bengkulu. Dr. Eko Risdianto, M. Cs from Universitas Bengkulu, Dr. Tri Basuki Kurniawan (AI Practitioner) from Universiti Kebangsaan Malaysia, Dr. Yupika Maryansyah, M.Pd. from Universitas Muhamadiyah Bengkulu, and Dr. Agus Riyanto, M.TPd. from STIKES Bhakti Husada Bengkulu were four instructors for this activity. The IHT was followed by a total of 80 training participants teachers from SMAN 3 Kota Bengkulu. They were majoring in various subjects. The training process included an opening speech delivered by Dr. Rustiyono, M.Pd., the principal of SMA 3 Kota Bengkulu. The instructor then presented materials on introduction to artificial intelligence (AI) for education. The presented contents were how to develop teaching modules, how to arrange presentations, how to make mind maps, and how to compose video for videos.

A response questionnaire was used as a non-test data collection method to assess the quality of training, which encompassed facilities, teaching AI applications, and training materials. Additionally, the data from the questionnaire was supported by observation on the training's implementation. The technique employed was a Response Questionnaire Instrument that included statements on facilities, used tools, used applications, delivered material, and assessment. These IHT training activity's steps were in accordance with the IHT Model developed by Dr. Rustiyono, M.Pd., the principal of SMAN 3 Kota Bengkulu.

Several artificial intelligence (AI) tools, including ChatGPT, ClassPoint AI, Gamma Apps, and Gemini, were utilized in this course to assist instruction. These applications were selected due to their capacity to improve the educational process, from the development of instructional materials to student engagement. Furthermore, the training makes use of cutting-edge tools like the Obsbot AI Camera, which makes it possible to perform hybrid learning by enabling both in-person and online sessions at the same time. In order to provide participants with a firsthand look at how AI technology might be incorporated into different teaching situations, instructors give genuine examples that are pertinent and applicable to each subject. With this method, educators may fully comprehend the useful advantages of any instrument and be prepared to employ it in the classroom.

Table 1. Distribution of questionnaire items

No	Aspects	Question Number	Number of Questions
1	General Assessment of Training	1,2,3	3
2	Assessment of Training Materials	4,5,6,7,8	5
3	Assessment of Facilities and Tools Used	9,10,11	3
4	Assessment of Material Delivery	12,13,14	3
5	Assessment of Practice and Application	15,16,17	3
6	General Evaluation of Training	18,19,20	3

This instrument was distributed after the training activity ended. After obtaining the data, it was then processed for interpretation. The data analysis techniques carried out included quantitative descriptive analysis to analyze the results of the questionnaire using the Likert scale. In addition, it also identified areas that need improvement based on responses from participants. Quantitative descriptive analysis used in data analysis was aimed to provide an overview and conclusion. This data provided information about the opinions of the trainees towards various aspects of the training. The following are the stages of the analysis:

First, encoding in a Likert scale for the given answer choices

1 = strongly disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

For each given question, the frequency (number) of each answer choice (1-5) was calculated, then converted into percentages, which was calculated by using the following formula:

$$\text{Percentage} = \left(\frac{\text{Frequency of Chosen Answer}}{\text{Total of respondents}}\right) \times 100$$

The following is a table showing the frequency, percentage, and number of respondents for each answer option in each question.

Table 2. Frequency and percentage of answers in each questionnaire question.

No.	Answer	Frequency	Percentage (%)
1	Strongly disagree	-	-
2	Disagree	-	-
3	Neutral	-	-
4	Agree	-	-
5	Strongly Agree	-	-
Total		-	-

To describe the overall assessment of each question, the average score (mean) for each question was calculated based on the Likert scale score. The formula for calculating the average is:

$$\text{Average Score} = \frac{\sum(\text{Total of Frequency} \times \text{Likert Scale Score})}{\text{Total of Respondents}}$$

Average Score: to determine whether the majority of respondents are likely to give a positive or negative assessment of the question.

Average score between 4.0 – 5.0: Indicates a very positive or agreeable result.

Average score between 3.0 – 3.9: Indicates a neutral or moderately agreeable result.

Average score between 1.0 – 2.9: Indicates a negative or disagreeable result.

C. Results and Discussion

AI training activities in learning through IHT activities at SMAN 3 Kota Bengkulu have properly been carried out.

Figure 1. The process of implementing IHT Training at SMAN 3 Kota Bengkulu

The training's key activity stages began with an overview of AI for learning, followed by practice with a variety of AI tools that can complement the learning process, like developing instructional modules. The first step in creating teaching modules was to raise awareness that they must be in line with learning

outcomes, particularly at the high school level (Phase E–F). The instructors then explained how to make an AI prompt that can be accurately entered. Following the development of the teaching module, instructional materials were produced using AI's assistance. For example, creating mind maps, presentations, and instructional videos. During the training activities that have been conducted, based on the observation done by instructors, participants were very excited to be involved in this activity from the beginning to the end. A questionnaire was distributed at the end of the activity in order to investigate how 69 participants responded to this training.

Based on the obtained data, the results of the questionnaire are as follows:

Table 3. Frequency and Percentage data table

Likert scale		1	2	3	4	5
	1	0.0	1.5	2.9	44.9	50.7
	2	1.5	0.0	2.9	40.6	55.1
	3	0.0	2.9	10.1	47.8	39.1
	4	0.0	0.0	5.8	30.4	63.8
	5	0.0	0.0	4.4	34.8	60.9
	6	0.0	0.0	4.4	43.5	52.2
	7	0.0	0.0	5.8	42.0	52.2
	8	0.0	0.0	4.4	46.4	49.3
	9	0.0	4.4	5.8	63.8	26.1
	10	0.0	2.9	10.1	65.2	21.7
Question	11	0.0	7.3	17.4	55.1	20.3
	12	0.0	0.0	5.8	47.8	46.4
	13	0.0	0.0	5.8	49.3	44.9
	14	0.0	0.0	7.3	50.7	42.0
	15	1.5	2.9	14.5	66.7	14.5
	16	1.5	2.9	13.0	66.7	15.9
	17	0.0	2.9	4.4	65.2	27.5
	18	0.0	1.5	5.8	55.1	37.7
	19	0.0	0.0	5.8	49.3	44.9
	20	1.5	0.0	10.1	58.0	30.4

The results of the quantitative descriptive analysis showed the average score for each question from the questionnaire that had been distributed. Some of the key findings are:

Average Score value:

a. The highest Score: The question on *the interesting material* received an average score of 4.58, indicating that the majority of participants really liked the provided materials.

b. The lowest score: The question on *the facilities provided to support the training* received an average score of 3.88, indicating a need to improve the facilities used during the training.

This means that most of the questions showed very positive results, with average scores ranging from 4.06 to 4.58, meaning participants were mostly satisfied with the training materials and the applicability of AI in learning. Some areas that could be improved were related to facilities (score 3.88) and participants' readiness to practice the material (score 3.90), which indicates the potential for improvement in terms of facility support and direct application of training materials.
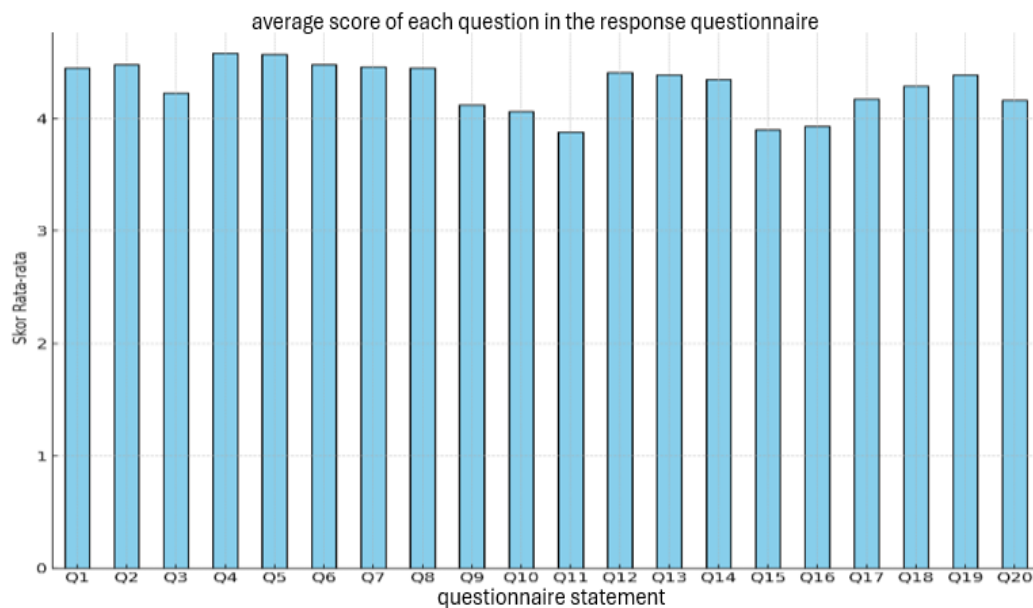
Figure 2. The average score of each question responses in the questionnaire.

The average score for every question in the questionnaire is displayed in the bar graph image above. With average scores ranging from 3.88 to 4.58, this graph clearly illustrates how participants evaluate various components of the training that was offered.

In general, the results of quantitative descriptive analysis on the IHT questionnaire responses of trainees at SMAN 3 Kota Bengkulu show very positive results. Based on the average score, the majority of participants gave good responses on various aspects of training, such as the material delivered, relevance to teaching needs, and the application of AI in learning. The item of *the material presented was interesting* and received the highest score (4.58), indicating that the material provided was very well received and attracted the attention of the participants. In addition, most participants felt interested in implementing AI tools introduced in the training. It was depicted with a fairly high average score on the related questions. However, although the majority of aspects of training received positive assessments, some areas still need improvement. The lowest score was found on items related to the *provided facilities*, with an average score of 3.88, indicating that supporting facilities like hardware and network need to be improved in order to promote a smooth running of the training. In addition, there were also areas that indicated the need for more time to practice the material. This can be seen in the score of 3.90 on statements related to *confidence in applying the material in teaching*, which were still below average. This suggests that while participants feel prepared, there is a need to ensure that they have enough time and facilities to truly master the application of the training material.

The teachers participating in this training showed high enthusiasm to implement AI in their respective teaching. After attending the training, they plan to utilize AI tools, such as *ChatGPT* to support the question-and-answer process and interactive discussions, as well as *ClassPoint* AI to increase student engagement through quizzes and polls in learning. Some teachers also plan to use *Gamma Apps* to create more engaging and easy-to-understand learning materials, as well as *Gemini* to personalize learning according to the needs of each student. This AI implementation not only aims to enrich the learning experience but also to improve teaching efficiency. It also allows teachers to provide faster feedback, and identify student needs more precisely. By applying AI to their subjects, teachers are expected to create a more dynamic and relevant learning experience, as well as support students in achieving optimal learning outcomes.

D.   Conclusion

The In-House Training (IHT) on the application of Artificial Intelligence (AI) in the classroom for teachers at SMAN 3 Kota Bengkulu was successfully conducted and well-received by the participants. The quantitative descriptive analysis of the questionnaire responses revealed a generally very positive assessment of the training across various aspects, including the relevance and interest of the presented

materials, the applicability of AI tools in learning, and the material delivery by the instructors. Specifically, the training materials were highly appreciated, as indicated by the highest average score.

However, the findings also highlight areas requiring attention. The facilities provided for the training received the lowest average score, suggesting a need for improvement in hardware and network infrastructure to better support future training activities. Additionally, while participants expressed interest in implementing AI, the slightly lower average score related to their readiness to practice the material indicates a need for more opportunities and time dedicated to hands-on application during training sessions.

Despite these limitations, the high enthusiasm expressed by the participating teachers to integrate AI tools such as ChatGPT, ClassPoint AI, Gamma Apps, and Gemini into their teaching practices signifies a positive step towards enhancing the learning experience and improving teaching efficiency at SMAN 3 Kota Bengkulu. The planned implementation of AI aims to create more dynamic, engaging, and personalized learning environments, ultimately supporting students in achieving better learning outcomes. Future IHT programs should consider addressing the identified needs for improved facilities and increased practical application time to further optimize the impact and effectiveness of AI integration in education at the school.

E.   Acknowledgment

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