



AI Training with ChatGPT to Develop Diagnostic Assessments

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Abstract

Diagnostic assessment is important to consider in the success of differentiated learning. Only 18.5% of teachers at Widiatmika Junior High School prepare and compile diagnostic assessments as a basis for selecting differentiated learning strategies. Therefore, training on the use of artificial intelligence (AI) through ChatGPT was held to improve the ability of teachers to prepare diagnostic assessments at Widiatmika Junior High School. The training was conducted through a workshop consisting of theoretical and practical sessions. The results of the training showed an increase in teachers' understanding and skills in designing diagnostic assessments. Teachers' enthusiasm and active participation were seen in the practical session, where they were able to ask in-depth questions about the application of ChatGPT. This training successfully demonstrated the potential of AI in supporting the learning process. By using ChatGPT, teachers can develop assessments that are more effective and appropriate to the needs of students, thus improving the quality of education at Widiatmika Junior High School.

Keywords:

1. *diagnostic assessment*
2. *differentiated instruction*
3. *chatgpt*
4. *artificial intelligent*

1. INTRODUCTION

Learning in Indonesia in 2024 has implemented an independent curriculum. The Indonesian Ministry of Education

and Culture promotes an independent curriculum that emphasizes the optimal development of students' individual potential. One of the learning approaches that is key in supporting this achievement

is differentiated learning (Purba et al., 2021). Differentiated learning in the Merdeka Curriculum allows teachers to customize teaching strategies by taking into account differences in students' abilities, interests, and learning styles. (Aprima & Sari, 2022; Mukhibat, 2023). This includes customizing materials, teaching methods, and evaluation to ensure each student can learn optimally.

Teachers as planners and implementers of learning through a differentiated approach are required to be able to develop flexible and adaptive learning strategies so that each student can achieve optimal learning outcomes (Ningrum et al., 2023; Suryani et al., 2024). This is a challenge given the diversity of abilities, interests, and learning styles in the classroom. (Hermansyah, 2023). The integration and utilization of technology can help teachers to effectively implement this approach (Thanh & Thanh Loan, 2024). Putra et al. (2023) mentioned that teachers' digital literacy skills are positively correlated with their pedagogical skills. This is because through the application of technology, teachers can access a variety of learning resources that are more diverse,

interactive, and in accordance with the needs of students.

With technology, teachers can also design various assessments, including diagnostic tests as the first step in differentiated learning. The purpose of diagnostic tests is so that the curriculum as an educational tool is able to help and direct students to maximize their potential. (Purba et al., 2021). Alfiana et al. (2024) explained that to maximize differentiated learning, diagnostic tests need to be conducted so that teachers can find out and map students into several learning groups based on their learning styles, interests, learning readiness, prior knowledge, and learning needs before starting the learning. Widiatmika Junior High School as an educational institution needs to strengthen teachers' capacity in implementing differentiated learning, especially in developing effective diagnostic tests.

The presence of technology such as ChatGPT offers innovative solutions to support teachers in developing diagnostic tests. Diagnostic assessments are tailor-made assessments to identify students' competencies, strengths, and weaknesses so that learning can be planned according to students' abilities and needs (Junaidah et al., 2023).

ChatGPT technology helps teachers save time in developing assessments, allowing them to focus on analyzing results and designing more targeted interventions.

The results of observations and interviews at Widiatmika Junior High School related to the preparation of diagnostic assessment documents are still low. Only 18.5% of teachers or five out of 27 teachers have made diagnostic tests that are used as a basis for determining strategies in differentiated learning. On the other hand, 81.5% of other teachers stated that they have never prepared diagnostic tests in the implementation of differentiated learning. Teachers generally use previous learning outcomes as the basis for differentiated learning.

This observation shows the gap in the application of diagnostic assessments in supporting the success of differentiated approaches as mandated in the independent curriculum. The low percentage (18.5%) of teachers who prepare diagnostic assessments is generally due to time constraints and teachers' digital literacy skills. As Mrs. Mira stated, *"Using the previous test results, such as last semester's summative results saves time rather than create a new diagnostic test."* Another teacher added, *"I want to try using technology like ChatGPT, but I don't know*

where to start. Time constraints and digital literacy are significant barriers to establishing diagnostic assessments in schools, mainly due to the pressure they put on educators and students. Time constraints and digital literacy constraints can lead to rushed assessments, negatively impacting diagnostic accuracy and evaluation quality (Cruz et al., 2024; Hooftman et al., 2024). In addition, the lack of digital literacy among teachers and students hinders the effective implementation of technology-based assessments, which are increasingly necessary in modern education (Abidah & Hartono, 2023).

As a growing educational institution, Widiatmika Junior High School needs to strengthen the capacity of teachers in utilizing new technology, especially the use of artificial intelligence such as ChatGPT. The time constraint of the first problem can be overcome by using GPT in various types of tests, including multiple choice, essay, fill-in-the-blank, and so on. To maximize the use of ChatGPT, teachers must understand the function of GPT to process natural language input (prompts) and generate coherent and purposeful responses through a process of iteration. This means that ChatGPT relies heavily

on how prompts are formulated specific, clear, and goal-oriented prompts will yield more accurate and useful outputs. (Shin et al., 2020; Zamfirescu-Pereira et al., 2023; Zhou et al., 2023).

For this reason, workshops on the use of GPT are needed as training for teachers. The school expects an AI training workshop using ChatGPT to develop diagnostic assessments in differentiated learning. This training workshop is designed to teach teachers how to use ChatGPT to develop diagnostic assessments that are aligned with differentiated learning principles. With the help of ChatGPT, teachers can develop questions that are more focused and appropriate to the students' ability levels so that the assessment results can more accurately identify the learning needs of each student. This session will make it easier for teachers to adjust effective learning strategies.

2. METHOD

The implementation method of the workshop and training using AI ChatGPT in developing diagnostic assessments in differentiated learning at Widiatmika Junior High School consists of 2 main stages, namely initial observation and training workshop.

Initial observation. Before the training began, data was collected related to diagnostic assessment practices currently used by teachers at Widiatmika Junior High School. This data was obtained through interviews and questionnaires to determine the level of teachers' understanding of differentiated learning and the use of technology in learning. Teachers were asked to complete a questionnaire to identify the difficulties and challenges they face in developing diagnostic assessments. This will provide an overview of more specific training needs.

A review of recent literature covering diagnostic assessment and AI adoption in education was conducted to ensure the reliability and relevance of the developed questionnaire. The questionnaire was developed based on 4 relevant articles as shown in Table 1 below. This questionnaire was used to measure the improvement in the pretest and posttest scores of the 27 teachers who participated in the workshop training session. The pretest was conducted shortly before the workshop training session began, and the posttest was conducted after the workshop training was completed.

Table 1. Key Articles Supporting Questionnaire Development

No	Author(s) & Year	Title	Contribution to Questionnaire Design
1	Alfiana et al. (2024)	Penggunaan Tes Diagnostik dalam Model Pembelajaran Berdiferensiasi	Clarified indicators for teacher understanding of diagnostic tools.
2	Putra et al. (2023)	Pengaruh Literasi Digital terhadap Kompetensi Pedagogik Guru	Provided constructs on digital readiness and barriers.
3	Thanh & Thanh Loan (2024)	Positive Impacts of ChatGPT on English Teachers	Offered perspectives on teachers' attitudes toward AI tools.
4	Junaidah et al. (2023)	Evaluasi Assessment Diagnostik dalam Perencanaan Pembelajaran	Informed practical challenges and implementation experiences.

Based on Table 1, the questionnaire in this research survey was further organized based on three main aspects, namely (1) understanding of differentiated learning, (2) utilization of technology in developing assessments, and (3) teachers' ability to use ChatGPT. Sequentially, each aspect presents 4 statement items related to aspect number

1, 4 items in aspect number 2, and 5 items in aspect number 3. So pretest there are a total of 13 statement items, which are used as pretests and posttests to evaluate the extent of teacher improvement in workshop implementation. Table 2 presents some sample statements used. Table 2 presents some sample statements used.

Table 2. Sample Questionnaire Items Based on Key Aspects and Supporting Literature

No.	Item Statement	Aspect Assessed
1	I have implemented principles of differentiated instruction in my teaching practice.	Understanding of Differentiated Learning
2	I feel the need for further training in using technology for assessment development.	Utilization of Technology in Assessment
3	I know what ChatGPT is and how it functions in an educational context.	Ability to Use AI Tools (ChatGPT)
4	I feel confident creating effective prompts when using ChatGPT.	Ability to Use AI Tools (ChatGPT)

Based on the observation and data collection, a training needs analysis was conducted. This aims to identify areas that need to be improved or strengthened, such as understanding of differentiated learning, utilization of technology in developing assessments, and teachers' ability to use AI tools.

Teacher's ability to use AI tools.

Training workshop on the use of chatGPT.

The workshop began with an introduction to the importance of diagnostic assessment in differentiated learning.

Traning Workshop. The speaker explained the basic concepts of diagnostic assessment, its benefits, and how technology, especially ChatGPT, can assist teachers in developing more effective assessments. A discussion on differentiated learning was also delivered to strengthen teachers' understanding of the need for this approach in the context of Merdeka Curriculum.

Teachers were given a basic introduction to artificial intelligence (AI) technology and how ChatGPT works. The presenters explained how ChatGPT can be used in an educational context, specifically to develop questions needed to develop diagnostic assessments. In this

session, teachers explored concrete examples of diagnostic questions at various cognitive levels (recall, conceptual, and application), and were guided to analyze the characteristics of effective assessment prompts. The method of creating an effective prompt refers to Ekin's method as follows (Ekin, 2023):

- a. Provide clear and specific instructions.
- b. Provide explicit limitations.
- c. Providing context and examples.
- d. Understand the question types on the GPT chat, i.e.. type 1 is for quick and factual questions, while type 2 is for questions that require analysis and reasoning.
- e. Setting the level of detail or length of an answer according to user needs

Based on this technique, the trainer provided best practice by demonstrating how the participants' questions were organized with or without the ekin's method. Teachers were asked to compile diagnostic assessment questions according to the needs of the teacher, in this case it can be a diagnostic assessment based on competence, motivation, and student learning styles.

3. RESULTS AND DISCUSSION

The AI training workshop activity using chatGPT which aims to improve teachers' understanding and ability to develop diagnostic assessments in differentiated learning has been carried out very well based on the following two indicators, those are 1) teacher enthusiasm and active participation, and 2) improving teachers' ability to develop diagnostic assessments using ChatGPT. This second indicator is based on the increase in pretest and posttest scores from the questionnaire, which consists of three main components, namely: 1) Understanding of Differentiated Learning, 2) Utilization of Technology in Developing Assessments, and 3) Teachers' Ability to use ChatGPT.

Teacher Enthusiasm and Active Participation.

Teachers' enthusiasm was seen not only in the practical session, but also during the theoretical presentation. Teachers showed great curiosity about how AI technology, especially ChatGPT, works. The questions asked covered various aspects, from the technical use of ChatGPT to how AI can help in diagnosing students' different needs. This participation not only shows the interest, but also the readiness of teachers to

innovate and adopt technology in learning.



Figure 1. Theory session (discussion)

In Figure 1, it can be seen that one of the teachers, Mr. Adi Susanta, who serves as a sports teacher at Widiatmika Junior High School, gave an excellent question, such as “How can I use ChatGPT to assess students' understanding of game rules or strategies in sports?” Furthermore, Mrs. Mirah, a teacher who is assigned to teach English and is currently participating in the teacher mobilizer program, also enthusiastically asked questions in the discussion session. The question asked was “How do we as teachers detect essays written by students with or without the help of ChatGPT?”

The discussion of questions by the speaker related to these two questions is as follows.

- a) The use of chatGPT can be widely utilized including in physical education or sports. The use of chatGPT in the field of sports, for

example, can be used to develop questions in the form of case studies that require students to analyze team strategies or make decisions in certain match situations, develop theories about physical fitness and assist reflection and independent learning.

- b) Concerns regarding the use of ChatGPT in writing assignments, such as in English lessons by students can be anticipated by using AI detection tools such as Turnitin with its AI-detection feature or GPTZero. In addition, teachers can also recognize students' writing styles and abilities. This is because students have unique writing styles, including the way they organize sentences, word choice, and the ability to convey arguments. The strategy of giving oral follow-up questions can also help teachers confirm the writing produced by students if the teacher still has doubts about the students' work. In the results and discussion, the author outlines the findings of the service activities that have changed the students' writing.

Improving Teachers' Ability to Develop Diagnostic Assessments Using ChatGPT.

The implementation of this workshop succeeded in increasing the

understanding and skills of teachers at Widiatmika Junior High School in developing diagnostic assessments with the help of ChatGPT. During the workshop, participants gained new knowledge about how artificial intelligence technology, such as ChatGPT, can help simplify and speed up the process of creating effective diagnostic questions that meet student needs. The presenters explained the concept of AI in depth, including the basic principles underlying ChatGPT's operation. This included how ChatGPT processes natural language, how it generates responses based on learned data, and its potential use to support various aspects of learning.

After a basic understanding of ChatGPT, the presenters continued with a practical explanation of the application of ChatGPT in education. Teachers were introduced to how ChatGPT can be used to construct relevant and effective diagnostic assessment questions. The presenters showed various examples of using ChatGPT to generate different types of questions, including questions based on students' competencies, motivation, and learning styles. These explanations aim to demonstrate the flexibility and effectiveness of ChatGPT

in generating questions that can measure different aspects of students' understanding and skills.



Figure 2. Practical session

In the practical session, teachers were asked to develop diagnostic assessment questions using ChatGPT. They were given guidance and instructions on how to write effective prompts to get results that suit their assessment needs. Teachers are taught to design clear and specific prompts so that ChatGPT can generate questions that are appropriate for the purpose of the assessment, be it related to students' competencies, motivation, or their

learning styles. This exercise aims to improve teachers' skills in using this technology practically.

In addition to composing questions, teachers are also given the opportunity to modify and customize the results provided by ChatGPT. In this process, they learn how to edit and adapt questions to better suit the context and needs of the students in their classroom. Teachers are encouraged to apply their creativity in customizing questions to ensure that the resulting diagnostic assessments are truly effective in evaluating important aspects of student learning.

The pretest and posttest design was used to measure changes in teacher scores in three aspects, namely (1) understanding of differentiated learning, (2) utilization of technology in developing assessments, and (3) teachers' ability to use ChatGPT.

Table 3. Pretest and Posttest Result

Item	Aspect	Pretest	Posttest	Gain Score	Gain (%)
1—4	understanding of differentiated learning	2,78	4,03	1,2325	44,03%
5—8	utilization of technology in developing assessments	2,81	3,99	1,19	42,2%
9—13	teachers' Ability to use ChatGPT	2,79	4,01	1,23	44%
1—13	all aspects	2,80	4,01	1,22	43,5%

Table 3 explains that overall, teachers' skills in the three aspects measured improved by 43.5%. The biggest improvement is shown in the aspect of understanding differentiated learning and teachers' ability to use ChatGPT. Although the increase seems to be slightly different between these two aspects. However, in general, based on the pretest data, it can be seen that teachers' abilities in these three aspects are still limited. Further discussion will be described as follows.

First, in terms of teachers' understanding of differentiated learning, the increase was the highest and can be said to have the same improvement as the ability of teachers to use ChatGPT. This is because after the training teachers feel that differentiated learning approaches are not always complicated to implement, especially with the use of technology. Especially in determining the initial diagnostic to implement differentiated learning. Through the utilization of ChatGPT, teachers can quickly develop assessments tailored to students' readiness levels, interests, and learning styles. This clearly helps to overcome the time constraints, which are the main issue in differentiated learning (Irzawati et al., 2024). Thus, technology not only

supports efficiency, but also opens up new possibilities to tailor learning to students' individual needs in a practical way. With training that integrates AI technology such as ChatGPT, this perception is starting to change. Teachers realize that preparing differentiated assessments does not have to be done manually and can be assisted by smart and adaptive technology.

Tomlinson (2011) stated that learning must be tailored to three main dimensions: student readiness, interest, and learning profile. To achieve this, teachers need accurate initial data obtained through diagnostic assessments. In this context, ChatGPT can serve as a tool to generate various types of questions that quickly and relevantly assess these dimensions (Irzawati et al., 2024; Jitpaisarnwattana, 2024). Furthermore, findings by Zhai (2023) indicate that ChatGPT has the potential to address some of the most challenging issues in science education through the development of automated assessments, automated feedback, automated tutoring, and automated learning material recommendations.

Second, from the aspect of technology utilization in assessment development, it shows a significant

increase of 42.2%. This reflects a paradigm shift in teachers from the conventional assessment approach to technology-based assessment. The utilization of technology in assessment also increases the efficiency of teachers' work. Based on post-training reflections, some teachers stated that they were able to develop questions with a wider scope and cognitive level in a shorter time.

This is in line with Liao's findings (2024), which stated that AI technology can accelerate the process of developing formative and diagnostic assessments, while maintaining the quality of the questions produced. In addition, this increase indicates an increase in teacher self-efficacy or confidence in using technology. Within the framework of the Technology Acceptance Model (TAM) theory, teachers' attitudes towards technology are greatly influenced by perceived ease of use and perceived benefits (Davis & Davis, 1989; Venkatesh & Davis, 2000). In Technological Pedagogical Content Knowledge (TPACK) approach effective technology integration must involve simultaneous pedagogical and content understanding (Celik, 2023; Koehler et al., 2017; Punya & Koehler, 2006; Santos & Castro, 2021).

Third, the aspect of teachers' ability to use ChatGPT showed the most significant improvement after training, with an increase of 44%. This shows that teachers not only understand the potential of ChatGPT theoretically, but also begin to master technical skills such as composing appropriate prompts and interpreting AI output results. This is certainly due to the clear directions on how to adjust prompts as explained in the previous method section. This is in line with Walter's statement (2024) who emphasized that the success of using AI in education is largely determined by the teacher's ability to design prompts that are effective and in accordance with learning objectives. This finding explains that ChatGPT is not a passive tool, but rather a collaborative system that requires natural language skills and contextual understanding from its users to produce optimal results.

4. CONCLUSION

The AI training workshop using ChatGPT to develop diagnostic assessments at Widiatmika Junior High School has successfully improved teachers' understanding and skills in designing assessments in accordance with the principles of differentiated learning.

Through this training, teachers not only learned how to use artificial intelligence technology, but also gained insight into the importance of diagnostic assessments in identifying students' learning needs. The results of the study showed that there was an increase in teacher abilities of 43.5% overall in the following 3 aspects, namely; 1) understanding of differentiated learning, 2) utilization of technology in developing assessments, and 3) teachers' ability to use chatgpt. This increase is also supported by findings that show the enthusiasm and active involvement of participants supporting these quantitative results. This means that after training, teachers become more confident in developing relevant and targeted questions, which is expected to increase the effectiveness of classroom learning.

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