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Teachers' Perceptions of the Use of AI in Developing Arabic Teaching Materials: *A Technology Acceptance Model* (TAM) *Perspective*

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ABSTRACT

Currently, teachers are faced with a heavy administrative workload and a packed teaching schedule, which hinder their ability to develop innovative teaching materials. Artificial Intelligence (AI) has emerged as a solution to assist educators in developing teaching materials. The purpose of this study is to describe the perceptions of Arabic teachers regarding the use of artificial intelligence (AI) in developing teaching materials at MTs Ar-Rohmah, MTsN 1 Bandung and SMP Miftahul Iman through the Technology Acceptance Model (TAM) framework, which includes Perceived Usefulness, Perceived Ease of Use, Attitude Toward Using, Behavioral Intention, Actual System Use, as well as the barriers teachers face in the process of utilizing AI. This study employed a descriptive qualitative approach using interviews and document analysis, which revealed that teachers who adopted AI had high Perceived Usefulness encompassing seven tangible benefits in the practice of developing teaching materials positive Perceived Ease of Use, albeit with varying levels of proficiency in using prompts, a positive Attitude Toward Using, a strong Behavioral Intention to continue using the technology, and active "Actual System Use" in their daily teaching practices. Meanwhile, teachers who do not adopt AI cite a lack of training, low technical skills, and a lack of support from fellow Arabic teachers as reasons for their low Perceived Ease of Use, which ultimately results in a negative Attitude Toward Using and a deferred Behavioral Intention contingent on specific prerequisites.

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PENDAHULUAN

Teachers are professional educators whose duties include educating, teaching, guiding, directing, training, assessing, and evaluating students at the early childhood, elementary, and secondary education level (Najmi, 2021). The competency standards that teachers must possess are stipulated in Law No. 14 of 2005 concerning teachers and lecturers. This article explains that teacher competencies are divided into four categories: pedagogical, personal,

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professional, and social. In the learning process, the way teachers deliver instructional material has a significant impact on students' understanding and engagement (Mea dkk., 2024). Conditions in the field indicate that, although the government has provided standards for instructional materials, these materials often do not fully meet students' needs, so teachers are required to develop and adapt the existing materials (Rosida & Sofa, 2025). At the same time, teachers also bear a heavy administrative burden and face a packed teaching schedule, which hinders the process of developing innovative teaching materials (Putra, 2024). These conditions have driven the need for teachers to have access to technological tools capable of optimizing their work efficiency (Ardila & Rigianti, 2023).

Artificial Intelligence (AI) has emerged as one solution to these challenges. Since 2024, UNESCO has supported 58 countries in developing digital and AI competency frameworks for their education systems (UNESCO, 2025). In Indonesia, the demand for technological proficiency is actually nothing new. Ministry of Education Regulation No. 16 of 2007 stipulates that teachers are required to utilize information and communication technology for both learning and professional development. Now, these requirements have evolved, and teachers are expected to be able to integrate AI into the learning process (Mambu et al., 2023).

The potential of AI is particularly relevant in Arabic language learning, which has complex linguistic characteristics, including phonology, morphology, syntax, and semantics (Syafei, 2025). AI can offer personalized and adaptive solutions, help identify difficulties in pronunciation and grammar, and provide immediate feedback (Supriyanto & Toifah, 2024). The use of technology has been proven to improve the quality of learning while supporting effective and efficient learning (Kodir, 2025). The use of technology can also help reduce teachers' administrative workload, such as managing assignments, grading, and interacting with students (Rosita et al., 2024). Research by Alam (2023) This also confirms that AI has a positive impact on teaching quality and student learning outcomes. Therefore, the use of AI in Arabic language learning should play a role in addressing the various learning challenges that arise.

However, the use of AI for Arabic language learning faces serious technical obstacles. A study by Abed (2025) shows that approximately 45.5% of the results generated by AI do not fully conform to the rules of the Arabic language, particularly nahwu and sharaf (morphology and syntax). Cronjé (2024) also notes that AI-generated content does not always align with learning objectives. Therefore, teachers need to review AI generated content (Selwyn et al., 2025). The main obstacle at present is teachers' low digital literacy, as many teachers still do not know or understand how to integrate technology into learning (Ahmad et al., 2021). This is due to a lack of training for teachers on the use of technology in learning (Wahyudinarti et al., 2025). This statement highlights a gap between the potential of AI to support learning and the reality of its use by teachers in the field.

These circumstances make research on the use of AI in Arabic language learning important, as Arabic demands precision in the areas of nahwu, sharaf, and linguistic meaning;

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thus, errors generated by AI have the potential to affect the quality of instructional materials. Therefore, it is important to understand how Arabic language teachers view the use of AI in their professional practice. Abdulayeva et al., (2025) emphasize that perception is one of the key determinants of technology acceptance or rejection: positive perceptions drive higher usage intentions, while negative perceptions can act as barriers even when the infrastructure is available. This means that understanding how teachers view AI is far more important than simply providing access to it. Unfortunately, studies on Arabic language teachers' perceptions of AI are still very rare. Research on teachers' perceptions at the junior high school level remains limited to general subjects such as Mathematics, Science, and Indonesian (Susilo et al., 2026; Nugroho et al., 2024; Baadilla et al., 2025). Meanwhile, research on AI in Arabic language learning is almost entirely conducted at the university level (Amadi & Hikmah 2025; Usof et al., 2025) view AI as an effective tool for learning Arabic, although academic guidance remains necessary. Research by Akinsemolu & Onyeaka (2025) and Fitri (2025) reveals that AI has a positive effect on the quality of teaching, although studies show that foreign language teachers have complex attitudes toward AI that are not entirely consistent.

Given this research gap, this study is the first to specifically examine the perceptions of Arabic teachers at the junior high school/MTs level regarding the use of AI in the development of teaching materials, using a descriptive qualitative approach. To systematically frame the analysis, this study employs the Technology Acceptance Model (TAM) developed by Davis (1989). TAM was chosen because it explains the factors influencing technology acceptance through five main constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATU), Behavioral Intention to Use (BU), and Actual System Use (ASU). These five constructs were fully utilized to describe why Arabic language teachers chose to accept or reject AI in their professional practice. In addition to TAM, this study also draws on the TPACK framework developed by Mishra and Koehler (2006) as a supporting perspective to understand why teachers with equal access to technology may exhibit vastly different adoption patterns, depending on the extent to which they are able to integrate technological, pedagogical, and content knowledge simultaneously into their teaching practices. This study aims to provide an in depth description of Arabic language teachers' perceptions regarding the use of AI in developing instructional materials through the five constructs of TAM, as well as to identify the barriers they face in the adoption process. The focus of this study is not on the technical effectiveness of AI but rather on how teachers, as direct users, view, respond to, and decide to use or avoid AI in their daily professional practice.

RESEARCH METHOD

This study employs a descriptive qualitative approach aimed at gaining an in-depth understanding and describing Arabic teachers' perceptions of using AI to develop teaching materials. The descriptive approach was chosen because it does not seek to produce statistical

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generalizations, but rather a detailed explanation of how teachers understand, adopt, and apply AI technology within a specific institutional context (Iskandar, 2009). This approach allows the researcher to capture the complexity of teachers' experiences as they are, in accordance with the realities observed in the field.

This study was conducted in Bandung, West Java, involving three junior high schools representing the institutional contexts of SMP/MTs. The three research sites were MTsN 1 Bandung, MTs Ar Rohmah Bandung, and SMP Miftahul Iman Bandung. The selection of these three distinct locations was intended to capture teachers' perspectives and experiences from diverse institutional contexts, thereby providing a comprehensive picture of teachers' perceptions regarding the use of AI in various types of junior high schools.

Participants were selected using purposive sampling because descriptive qualitative research does not aim for generalization but rather to gain an in-depth understanding of cases that are rich in information and relevant to the research questions (Patton, 2015). Three Arabic teachers were selected based on the following criteria: teaching at the junior high school (SMP) or Islamic junior high school (MTs) level in the city of Bandung; having at least two years of teaching experience; being willing to participate in in-depth interviews and document analysis; and having access to or having considered the use of AI in instruction whether they had already adopted it or not.

These three informants were deliberately selected because they possess relevant and diverse firsthand experience. Together, they represent the full spectrum of AI adoption—ranging from active adoption, limited adoption, to non-adoption with openness to future adoption. The methodological differences in the profiles of these three informants strengthen the quality of the data obtained. Teacher 1 is a young teacher at MTs Ar Rohmah, a private school following the Ministry of Religious Affairs (Kemenag) curriculum, who has participated in AI training organized by an independent educational institution (Darrut Tauhid). As a result, they are proficient in prompt engineering techniques and the use of AI tools such as Gemini and ChatGPT to develop various teaching materials. Teacher 2, on the other hand, is a senior teacher with 16 years of teaching experience at SMP Miftahul Iman, which uses the Local Content (Mulok) curriculum. Teacher 2 has never directly participated in AI training but acquired this knowledge through internal sessions led by an ICT teacher who had previously received training from the Department of Education. Teacher 2 actively uses AI tools such as ChatGPT and Gemini to assist with their work, including the development of teaching materials. However, they do not employ prompt engineering techniques in their use of these tools. This is due to limited knowledge of these techniques, stemming from a lack of direct guidance or training on the proper and effective use of prompts. Finally, Teacher 3 is a senior teacher at MTsN 1 Bandung, which follows the Ministry of Religious Affairs (Kemenag) curriculum, and has been teaching for 23 years. They have chosen not to adopt AI in the development of teaching materials. His consideration was to maintain the quality of Arabic language instruction. However, he remains open to learning

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about and using AI in the future if adequate support is available.

The methodological differences in the profiles of these three informants strengthen the quality of the data obtained. This heterogeneity allows the researcher to capture a variety of teachers' perspectives and experiences regarding AI, so that the analysis can reflect the complexity of teachers' perceptions in the field. Although there were only three informants, this number is considered adequate in the context of descriptive qualitative research with a clearly defined focus. Data saturation in qualitative research is achieved when there is sufficient information to replicate the study, the ability to obtain additional new information has been exhausted, and further coding no longer yields new themes (Fusch & Ness, 2015). In this study, data saturation was reached during the third interview because no new themes or information emerged from the third informant beyond what had already been identified. This aligns with the principle that thematic saturation is marked by a high degree of consensus among informants, indicating that information from the interviews has begun to repeat (Saunders et al., 2018). Thus, the three informants in this study do not represent a limitation due to access constraints but rather a number that meets the standard for data *adequacy* in descriptive qualitative research.

In depth interviews and a document analysis were used to collect data for this study. In-depth interviews served as the primary instrument to directly explore how teachers interpret the use of AI and to delve into their experiences, processes, and real world challenges when designing Arabic teaching materials. Meanwhile, the document analysis was used to supplement and validate the interview data. This documentation process focused on collecting physical or digital evidence in the form of teaching material designs, lesson plans, and prompts developed by teachers using AI platforms. In qualitative research, the primary instrument is the researcher themselves, who goes directly into the field to explore participants' experiences. To guide the data collection process so that it remains focused and directed, supporting instruments were provided in the form of in-depth interview guidelines and documentation study guidelines. The interview guidelines consisted of a list of open ended questions designed to be flexible. These questions aimed to explore in depth how teachers' perceptions align with the Technology Acceptance Model (TAM) framework.

In this study, data were collected in six stages. First, the researcher developed the interview instrument based on the established indicators of the Technology Acceptance Model (TAM). Second, the instrument underwent construct validation to ensure alignment with the study's focus. Third, the researcher conducted in-depth interviews with three teachers as research informants. Fourth, the entire interview process was recorded. Fifth, in addition to the interviews, the researcher also conducted a documentary study to collect relevant documents. Sixth, all interview recordings were transcribed verbatim into complete text data, ready for analysis in the next stage.

This study then employed the interactive data analysis model proposed by Miles, Huberman, and Saldaña (2014), which consists of three main stages: data condensation, in

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which the researcher selected, simplified, and abstracted the raw data from the interview recordings of the three Arabic language teachers. In this stage, coding was performed to group the data based on the TAM constructs namely, Perceived Usefulness, Perceived Ease of Use, Attitude toward using, Behavioral Intention, and Actual System Use as well as other themes emerging from the data, including barriers. Next, the condensed data were presented in a narrative and descriptive format during the data display stage. Finally, the researcher drew in-depth conclusions regarding teachers' perceptions of AI use in developing Arabic teaching materials. This study then applied data validity testing through data triangulation, as described by Sugiyono (2016), two types of triangulation were used: methodological triangulation and source triangulation.

RESULTS AND DISCUSSION

This study explores Arabic teachers' perceptions of the use of AI in developing teaching materials through the Technology Acceptance Model (TAM) framework proposed by Davis (1989), which encompasses five main constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Using (ATU), Behavioral Intention (BI), and Actual System Use (ASU), as well as the barriers experienced by teachers. These five constructs do not stand alone but influence one another in a sequential manner. PU and PEOU shape ATU, ATU drives the formation of BI, and BI ultimately determines ASU as the tangible manifestation of technology use in teaching practice (Wicaksono, 2022, p. 32).

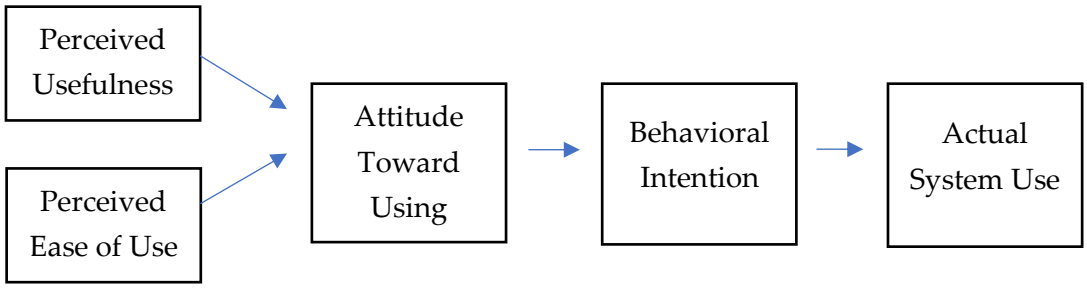

Figure 1. Technology Acceptance Model (Wicaksono, 2022, hlm. 32)

The following are the results of the coding of in-depth interview transcripts based on the five main constructs of the Technology Acceptance Model (TAM) along with the subthemes derived from each construct.

Table 1. Coding Results Based on TAM Constructs

TAM Constructs	Subthemes	Informant
Perceived Usefulness	Time Efficiency	G1, G2
	Reduction of administrative burden	G1, G2
	Providing a wide range of resources	G1, G2
	Personalized learning	G1
	Brainstorming partners	G1, G2

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	Translation skills	G1, G2
	Digital content development	G1
Perceived Ease of Use	Access Flexibility	G1, G2
	AI Response Speed	G1, G2
	Ease of giving instructions	G1, G2
	Availability of institutional training	G1, G2
	Affordability	G1, G2
Attitude toward using	Positive / enthusiastic	G1, G2
	Helps in developing teaching materials	G1, G2
	AI Anxiety	G3
	Ethical concerns	G1, G2, G3
	Trust Issues	G3
	Threats to professional identity	G3
	Low self-confidence	G3
	Low technical proficiency	G3
	Lack of school and social support	G3
Behavioral Intention	Intention to continue using	G1, G2
	Conditional intention	G3
Actual System Use	Active use	G1, G2
	Not in use	G3

A. Perceived Usefulness (PU): Perceived Benefits of AI in Developing Teaching Materials

The table above shows that the Perceived Usefulness construct consists of 7 points or subthemes. PU, or perceived usefulness, is defined as the user's level of confidence that using the technology will help them achieve their work goals and improve their performance (Davis, 1989). PU is also defined as a person's perception of the extent to which technology can help them perform tasks or achieve goals.

The large number of subthemes in this construct indicates that the benefits of AI are truly felt by Arabic language teachers, particularly teacher 1 and teacher 2. However, even though Teacher 3 did not adopt AI, he still indicated that time efficiency is a benefit genuinely felt by teachers. Based on Teacher 3's statement, preparing teaching materials used to take several hours or even one or two days. In contrast, when using AI, answers are generated in a matter of minutes or even seconds. Teacher 1 stated: *"AI has been a huge help to me; by using it, I don't need to spend much time preparing teaching materials*." Teacher 2 echoed this sentiment, noting that time efficiency is a tangible benefit. Thus, the first benefit experienced by the teachers is time efficiency.

Next, the second benefit experienced by teacher 1 and teacher 2 is a reduction in teachers' administrative workload when using AI. Teacher 1 stated: *"With this AI, I can make better use of my time by completing other tasks. So I feel that AI can also reduce the administrative burden*." Teacher 1 added that since the introduction of AI, many administrative tasks such as preparing lesson plans, worksheets, and assessment questions

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can be handled by AI, significantly reducing the workload. This statement indicates that, in addition to experiencing time efficiency, teachers also feel that AI reduces their administrative burden.

Providing a wide range of teaching materials is the third benefit that teachers greatly need. Initially, teachers gathered teaching materials by searching for references in various dictionaries and books. However, since the introduction of AI, teachers have been able to find resources more conveniently. As teacher 1 explained: "*Since AI became available, I no longer need to look for references in various books, because AI can provide comprehensive materials. Thus, I only need to verify the accuracy of the AI's output.*" Furthermore, with the extensive teaching materials generated by AI, Teacher 1 also noted that AI can supplement the limitations of the teaching materials already provided by the school. Teacher 1 explained: "*At school, every student has a workbook, but these workbooks do not yet align with learning needs and objectives, so I have to supplement the teaching materials with the help of AI*." Thus, teachers can enrich materials that are deemed insufficient, ensuring that the quality of learning is maintained even when students' textbooks have limitations.

Personalized learning is the fourth benefit experienced by teachers. Teacher 1 explained: "*I use AI to tailor learning materials to students' interests or current trends. And I find that when learning is aligned with students' interests, they become enthusiastic and actively engaged*." Teacher 1 also noted that AI can serve as a *brainstorming* partner. This is the fifth benefit experienced by teachers. AI can generate creative ideas that would not have been thought of otherwise, such as group-based learning strategies integrated with visual media through Canva. This statement is further supported by teacher 1, who noted that AI can provide creative ideas.

The sixth benefit is the ability to translate Arabic text or vice versa. For Arabic teachers, this process is very helpful in developing teaching materials; if errors are found in the translation, teachers can immediately re-instruct and validate the translation. This is a tangible benefit experienced by teacher 1 and teacher 2. The seventh benefit is the development of teaching materials in digital formats, as experienced by teacher 1 such as e-vocabulary, which has proven to be more engaging for students.

Overall, these seven benefits of PU that teacher 1 and teacher 2 have a high PU toward AI, consistent with Davis's Technology Acceptance Model (TAM, 1989), which states that PU is the primary determinant of users' attitudes and intentions toward adopting technology.

B. Perceived Ease of Use (PEOU): Perception of the Ease of Using AI

This study identifies five subthemes of the PEOU construct. PEOU refers to the degree of confidence that using technology does not require excessive effort (Davis, 1989). Wicaksono, (2022, p. 30) supplements this definition by stating that the operational ease of

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technology, the availability of technical support, and the availability of supporting resources influence perceptions of ease of use.

The first subtheme is the flexibility of AI access. Teacher 1 and teacher 2 noted that AI can be accessed anywhere and anytime as long as there is an internet connection whether while planning lessons, preparing for class, or when students ask questions in class. The second subtheme is the speed of AI's responses. Teacher 2 stated: *"I enjoy using AI assistance because I don't have to wait long for the AI's responses. The time spent revalidating instructional materials is much shorter than when I create them manually."* Teacher 1 also echoed this sentiment, saying: *"AI has been a great help to me; by using it, I don't need much time to prepare instructional materials*."

The third subtheme is the ease of giving instructions. A significant difference emerged between Teacher 1 and Teacher 2. Teacher 2 used their own language when giving instructions to the AI, while teacher 1 used prompt engineering techniques learned through formal training. This difference is directly related to the fourth subtheme, namely the availability of institutional training. Teacher 1 received training from Daarut Tauhid on prompt engineering, while teacher 2 received indirect guidance through an ICT teacher from BBPNPT. These differences in training quality directly influence the teachers' ability to optimize AI usage. However, both direct and indirect AI training at least help teachers adopt AI. The final subtheme is cost accessibility: Teacher 1 uses the free public version, while teacher 2 accesses premium tools through a government provided belajar.id account. However, this difference does not prevent the teachers from continuing to use AI.

Unlike teacher 1 and teacher 2, teacher 3 expressed a low perception of ease regarding AI. He admitted that he had not yet mastered how to use AI and found it difficult to do so. Additionally, the absence of a colleague teaching the same subject was a primary factor contributing to his low PEOU. As teacher 3 stated: *"I haven't mastered AI in other words, I'm technologically illiterate and I don't know how to use it properly, plus there are no colleagues teaching the same subject who can use AI*." Thus, the low PEOU experienced by teacher 3 ultimately contributes to their negative attitude toward AI, as will be discussed in the following ATU construct.

C. Attitude Toward Using (ATU): Teachers' Attitudes Toward AI

The table above lists seven subthemes that illustrate the significantly different responses of the three teachers. Within the TAM framework, ATU is a construct that describes users' attitudes toward technology. These attitudes can take the form of either rejection or acceptance.

This study shows that Teacher 1 and Teacher 2 have positive attitudes toward AI in the sense of acceptance. They feel that the use of AI greatly assists in the process of developing teaching materials and generates enthusiasm for exploring AI. Although teacher 1 and teacher 2 demonstrate positive attitudes toward AI, both still have *ethical*

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concerns regarding the risk of dependence on AI. Teacher 1 stated: *"I limit my use of AI because I'm afraid of becoming dependent on it."* Teacher 2 stated: *"Use AI only when needed, so as not to become dependent on it."* These statements indicate that a positive attitude toward AI does not imply unlimited acceptance.

In contrast, Teacher 3, who does not use AI, exhibits a negative attitude or resistance toward the use of AI for developing teaching materials. This positive attitude aligns with the findings Collie et al., (2024) which state that teachers' acceptance of AI is influenced by their perception of leadership support and personal interest in professional growth. Furthermore, the negative attitude or resistance exhibited by teacher 3 is influenced by several factors.

The first factor is *AI* anxiety about using AI. Teacher 3 explained: *"Since I've never attended any training, I'm afraid of making mistakes when using AI, so I'm hesitant to try it again*." The second factor is a trust issue specifically, a lack of confidence in the accuracy of AI outputs. This *trust issue* stems from Teacher 3 experience experimenting with AI, during which they encountered errors in Arabic grammar and found that the provided answers did not meet their intended needs. Teacher 3 explained: *"One reason I don't use AI is that the answers generated by AI aren't what I want, and most importantly, the Arabic produced by AI doesn't match the instructions I gave*." The third factor is a lack of technical proficiency in using AI. This factor has been explained in the PEOU construct, indicating that Teacher 3 does not yet know how to use AI correctly. The next factor is the lack of support from the school and colleagues. This is evidenced by the lack of training provided at the school and Teacher 3 statement that they do not have a colleague teaching the same subject with whom they can discuss or share experiences regarding the use of AI in teaching.

Furthermore, although the three teachers differ in their attitudes toward AI, all three agree that AI will not be able to fully replace the role of teachers; they agree they do not have any Professional Identity Threats or concerns that the use of AI could threaten their professional identity as Arabic language teachers. This indicates that none of them have Professional Identity Threats or concerns that AI threatens their professional identity as Arabic language teachers. Teacher 1 emphasized that "*AI will not be able to replace teachers, because it is the teacher who actually teaches*." Teacher 3 also stated that *"AI is just a tool, so in my opinion, AI will never be able to replace the role of a teacher."* Meanwhile, teacher 2 offered a more critical perspective, stating that *"If the government does not consider students' character development, it is possible that teachers could be replaced by AI and vice versa*." This statement by Teacher 2 indicates that the issue of teachers being replaced by AI is not merely a technological matter but also concerns educational policy and a commitment to fostering students' character.

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D. Behavioral Intention (BI): Intention to Use AI

Within the TAM framework, BI refers to the user's intention to use technology, which is formed as a direct consequence of the previously established ATU (Davis, 1989). This study shows that while the three teachers have different intentions, they are all open to using AI in the future. Teacher 1 and Teacher 2 cited four factors driving their need to use AI: the need for administrative efficiency in teaching, the desire to improve the quality of learning, the limited availability of Arabic learning resources at the school, and the training opportunities provided by the school. Thus, Teacher 1 and Teacher 2 demonstrated a strong intention to continue using AI as a direct result of their positive ATU. Both stated that they would continue to use AI and wished to further develop their proficiency in its use. Teacher 1 emphasized the importance of a prudent approach to AI use that is, using it appropriately and only as needed to support learning. Teacher 2 hopes that in the future, all teachers will receive comprehensive training and anticipates the development of more advanced AI features to support the creation of learning materials. This strong intention is a logical consequence of the positive ATU and the actual usage experience that has already been established.

Teacher 3 expressed an intention to adopt AI in the future if there are guarantees regarding the quality of *the output* and adequate, language-specific training support for Arabic. Teacher 3 stated: *"One of the reasons I don't use AI is because I'm not tech-savvy and haven't been able to operate it properly yet. Therefore, if there were specialized training for Arabic teachers on using AI, I would try to use it*." Teacher 3 perception indicates that a negative ATU does not necessarily lead to rejection but can result in a deferred intention under certain conditions.

E. Actual System Use (ASU): Actual AI Use

Within the TAM framework, ASU is the tangible manifestation of all previously formed constructs, ranging from PU, PEOU, ATU, to BI. This construct serves as the point of confirmation as to whether the perceived benefits discussed earlier are truly realized in actual field practice. Based on the interview results, both teachers have actually used AI to develop various types of Arabic teaching materials, including vocabulary, lesson plans, practice questions, simple sentences, short stories, translations, and brainstorming learning ideas. In terms of usage context, Teacher 1 and Teacher 2 utilize AI not only outside the classroom while preparing materials but also inside the classroom during instruction. This indicates that the use of AI is already integrated into their daily teaching practices, rather than merely serving as an occasional tool.

Conversely, the absence of ASU in teacher 3 confirms a series of constructs that were hindered from the outset. AI anxiety, trust issues regarding the accuracy of Arabic language output, and the lack of training support and colleagues have shaped a negative ATU and a delayed BI, resulting in no actual use whatsoever. This situation reinforces the

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argument that, within the TAM framework, even a high perceived utility will not be sufficient to generate positive actual usage if the connecting constructs are hindered by unresolved structural and personal factors.

F. Barriers to AI Use in Developing Arabic Teaching Materials

Although AI offers many benefits and is perceived as easy to use, this study also identified a number of tangible barriers that teachers face in the process of utilizing it. It is important to understand that these barriers are not only experienced by teachers who choose not to adopt AI but are also felt by teachers who are already actively using it. What distinguishes the two is not the presence or absence of barriers but how each teacher responds to them.

The first barrier is that AI output does not always align with the instructions provided by teachers. Teacher 1 stated: *"Sometimes I feel that the results generated by AI do not match what I want."* This mismatch stems from AI's limitations in accurately understanding the context and specific needs of users, especially when the instructions provided are not sufficiently structured.

The second challenge, closely related to the first, is the lack of prompt literacy or the teacher's ability to formulate effective instructions for the AI. Teacher 2 stated*: "I feel like I have to instruct the AI repeatedly to get the results I want. Perhaps this is also because I don't know what kind of prompt is appropriate."* This challenge was also the main reason Teacher 3 decided not to adopt AI at all, as Teacher 3 realized that one of the causes of the mismatch in *output* was their lack of knowledge regarding how to use the right prompts. Many educators lack the necessary training to engage in prompt engineering, so their ability to design interactions that yield high quality AI output is limited. Thus, the lack of adequate prompt engineering skills is a key factor distinguishing teachers who can overcome these obstacles from those who cannot.

The third challenge is the accuracy of AI *output* regarding Arabic grammar rules. Arabic has linguistic complexities, particularly in the areas of nahwu and sharaf, so teachers are required to be more meticulous in verifying every piece of output generated. Teacher 1 noted that *"The Arabic generated by AI often contains errors, especially in nahwu and sharaf, so I always have to double-check the harakat, and sentence structure."* This finding was supported by an analysis of teaching materials created using AI. Several types of errors in Arabic grammar were identified, including mismatches between the verb (fi'il) and the subject (fa'il) in terms of part of speech, where the verb used did not align with the masculine (mudzakkar) or feminine (muannats) gender of the subject. Additionally, errors were found in the use of verbs with plural pronouns. In story based materials, the use of colloquial (ammiyah) vocabulary was found to be inappropriate for the context of teaching standard Arabic (fusha) at the junior high school level. These findings indicate that AI is not yet capable of accurately processing the grammatical consistency of the Arabic

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language. On the other hand, an analysis of the lesson plans (RPP) created with AI assistance revealed that teachers had made corrections and adjustments before the documents were used, indicating that teachers have positioned themselves as active validators of AI output.

The fourth challenge faced by teachers is that, when responding to statements, the AI uses language that is too formal and stilted, making it feel unfamiliar. Teachers noted that AI generated text often feels rigid and does not reflect natural communication in a classroom setting, requiring further adjustments before the material can be used directly. AI-generated text tends to use analytical and academic language to appear more sophisticated, which actually makes it feel too formal and impersonal

The four barriers identified in this study indicate that the challenges in utilizing AI are not only technical but also linguistic and pedagogical. Teachers need to position themselves as active editors and validators of every AI output, ensuring that the technology serves to enhance human potential rather than replace it. Teacher 1 and teacher 2 successfully overcame these barriers by implementing self validation strategies, while teacher 3, who did not yet have such a strategy, chose not to continue adopting AI in the learning process.

The findings of this study reveal that Arabic teachers' perceptions are influenced by both TAM constructs: PU and PEOU. When teachers perceive AI as highly beneficial or have a high PU it can be predicted that they will hold a positive attitude toward AI. The seven subthemes of PU perceived by the teachers illustrate that the benefits of AI have been tangibly felt in the practice of developing teaching materials. Meanwhile, the five aspects of PEOU perceived by the teachers indicate that using AI is not technically challenging.

Differences between teacher 1, teacher 2, and teacher 3 also highlight the role of training. Teacher 1 received hands on training, which not only covered how to adopt AI but also provided guidance on using AI by instructing them on how to use prompts. Teacher 2 received training facilitated by an ICT teacher; however, the Arabic language teachers did not fully benefit from the training. Ultimately, when adopting AI, the Arabic language teacher still relies on their own language. Meanwhile, teacher 3 never participated in or received training from the school, so they lack confidence in adopting AI to assist with their work. Teacher 3 considers themselves technologically illiterate regarding AI adoption and feels they have not yet mastered how to use it effectively. Teacher 3 did try using AI, but the results were not as expected. Furthermore, teacher 3 does not have any colleagues teaching the same subject who have also adopted AI, as none of them yet understand how to use it.

From the analysis of these three teachers, it becomes clear that the main barrier preventing teacher 3 from adopting AI is the lack of proficiency in using it effectively. This is not because teacher 3 is unaware of the benefits of AI or does not trust the technology,

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but rather due to the lack of formal training, lack of support from the school and colleagues, and low self efficacy. Meanwhile, teachers 1 and 2 have overcome these barriers and will continue to use AI.

Thus, these findings indicate that training is a critical requirement for ensuring technology adoption, as the quality and comprehensiveness of training indirectly influence teachers' self-confidence, their ability to optimize usage, their resilience in the face of obstacles, and the sustainability of adoption. Consequently, efforts to increase AI adoption in Arabic language learning must begin with a serious commitment to providing high-quality, context-specific training tailored to the Arabic language learning context not merely general orientation sessions. Teachers also acknowledge that AI often makes errors in nahwu and sharaf grammar, necessitating re-validation.

This study views the decision to adopt technology not merely as an individual decision, but as the result of individual factors (knowledge, self confidence), institutional factors (training, access), and content factors (accuracy of rules, pedagogical appropriateness). These findings are also consistent with the framework developed by Mishra and Koehler, namely TPACK (2013). TPACK emphasizes that success in adopting technology in learning is determined by teachers' ability to integrate three types of knowledge simultaneously: content knowledge, pedagogical knowledge, and technological knowledge (Koehler dkk., 2013). The findings of this study indicate the existence of a digital divide among Arabic language teachers, where not all teachers possess the same level of readiness to adopt AI for instructional purposes. Teachers who successfully integrate AI into their teaching practices are those who are able to integrate technological, pedagogical, and content knowledge simultaneously, as described in the TPACK framework and vice versa. This situation further underscores that the adoption of AI in Arabic language learning cannot be driven solely by the availability of technology but must also be accompanied by adequate pedagogical competence. This aligns with the view that to ensure high-quality Arabic language instruction and achieve established learning objectives, teachers as key stakeholders must have a clear foundation in Arabic language teaching (Nurbayan dkk., 2024).

CONCLUSION

This study concludes that Arabic teachers' perceptions of AI utilization in developing instructional materials can be systematically explained through the TAM framework. Teachers who have adopted AI (G1 and G2) exhibit a complete and positive TAM construct chain, ranging from high PU, positive PEOU, accepting ATU, strong BI, to active ASU in daily practice. Conversely, G3 exhibited a disrupted TAM chain starting from the PEOU construct due to a lack of training and peer support, leading to a negative ATU and a conditional BI. Nevertheless, G3 resistance is not absolute, as they expressed openness to adopting AI if adequate training were available. All three teachers agreed that AI would not replace the role

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of teachers, confirming the absence of Professional Identity Threats among all informants. Four main barriers were identified: mismatches between the AI's output and the teacher's instructions; limited prompt literacy; inaccuracies in Arabic grammar (nahwu) and morphology (sharaf) in the AI's output; and the AI's overly formal language register. These findings underscore that the effective and sustainable adoption of AI in Arabic language learning requires structured training specific to the Arabic language context, tangible institutional support, and adequate pedagogical competence on the part of each teacher.

For teachers, it is important to develop prompt writing skills and the habit of validating AI output. For institutions, providing training support and institutional access to AI directly contributes to effective adoption. For policymakers, structured AI competency development programs are needed for Arabic language teachers, particularly in schools where Arabic is taught as a local curriculum subject. Informants emphasized that AI is merely a tool that will never replace the teacher, as the teacher's role extends to shaping students' character. The teachers who will thrive in the future are those who can collaborate with AI rather than compete against it. This study is limited to three informants in a single city and therefore cannot be broadly generalized. Further research is recommended to expand the scope of informants across regions and educational levels or to integrate TPACK as the primary analytical framework to obtain a more comprehensive picture of Arabic teachers' readiness to adopt AI in Indonesia.

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