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Authentic Assessment of Maharah Kalam Based on STEAM Assisted by Artificial Intelligence in the Arabic Language Competency Test at MTs 2 Nurul Islam Mojokerto

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Abstract:

Digital transformation and advancements in Artificial Intelligence (AI) call for Arabic language assessments that measure not only linguistic proficiency but also communication skills, creativity, critical thinking, and digital literacy. However, *Maharah Kalam* assessments still tend to rely on memorized dialogues, question-and-answer sessions, and conventional presentations. This study aims to: (1) to analyze the implementation of STEAM-based authentic *Maharah Kalam* assessment through an AI-assisted comic project; and (2) to analyze the project's contribution to the development of future-oriented learning competencies. This study employed a qualitative approach using a case study design involving 20 eighth-grade students in the International Class Program at MTs 2 Nurul Islam Mojokerto. Data were collected through observation, interviews, and documentation, and then analyzed using the Miles, Huberman, and Saldaña model. The results of the study show that an authentic STEAM-based *Maharah Kalam* assessment using an AI-assisted comic book project is capable of providing a contextual and meaningful evaluation of Arabic language proficiency. A total of 14 out of 20 students (70%) achieved a score of ≥ 70 , with an average of 74.75. This project also develops future-oriented learning competencies, particularly creativity (80%), digital literacy (75%), communication (70%), confidence (65%), critical thinking (60%), and problem-solving (55%). Thus, the integration of STEAM and AI has the potential to serve as an innovative and future-oriented alternative for Arabic language assessment. This study contributes by proposing an authentic assessment model that integrates Arabic, STEAM, and AI, with AI serving as a cognitive tool and the teacher acting as a facilitator.

Keywords: Authentic Assessment; Maharah Kalam; STEAM Education; Artificial Intelligence; Future-Oriented Learning

Introduction

Digital transformation and the development of Artificial Intelligence (AI) are driving education toward future-oriented learning that emphasizes creativity, communication, collaboration, critical thinking, problem-solving, and digital literacy. In Islamic education, Arabic language learning needs to go beyond linguistic mastery to communicative, creative, and contextual language skills (Al Momani, 2024). The STEAM (Science, Technology, Engineering, Arts, and Mathematics) approach can support this goal through learning that integrates technology, creativity, problem-solving, and communication. The integration of STEAM and AI also allows students to produce work and be assessed authentically through process, product, and performance, thus making Arabic language learning more innovative and oriented toward future competencies (Alsaied, 2024).

The *Maharah Kalam* competency exam in various Islamic schools still tends to use conventional assessment methods, such as dialogue memorization, simple question-and-answer sessions, and presentations (Mardhotillah & Syarifah, 2025). While these methods can provide a snapshot of basic speaking skills, their implementation does not fully reflect students' authentic communication skills in meaningful situations. Assessments that focus on material reproduction also have limitations in revealing creativity, critical thinking, collaboration, and digital literacy, which are increasingly necessary for language learning in the technological era (Sa'adah, Armadani, & Kholilurrahman, 2026).

At the same time, the use of Artificial Intelligence (AI) in Arabic language learning continues to grow, but its use is still mostly positioned as a medium or learning aid, for example to generate materials, exercises, translations, or feedback (Muharom, 2025). The use of AI as part of authentic assessment is still underdeveloped, particularly for assessing *Maharah Kalam* abilities through tasks that require students to produce work while demonstrating communication performance (Badawi, Takruri, & Salameh, 2026). This condition indicates the need to design a form of assessment that not only measures language proficiency but also is able to provide authentic communication experiences and integrate creativity, technology, and future competencies.

This research is based on five interrelated concepts in building a framework for Arabic language learning and assessment relevant to the demands of future education. Islamic Education, which refers to the thoughts of Syed Muhammad Naquib al-Attas, serves as a value foundation that emphasizes the integration of knowledge, manners, and Islamic values in the educational process (Yuwono & Nurhuda, 2024). This foundation is combined with Authentic Assessment developed by Grant Wiggins, an assessment approach that measures students' abilities through tasks and performance that represent the use of knowledge in real situations (Rahmadani, 2024). Furthermore, STEAM Education, developed by Georgette Yakman, provides an integrative approach by connecting Science, Technology, Engineering, Arts, And Mathematics to encourage creativity, problem-solving, collaboration, and the creation of meaningful work (Setiani, Widiasih, Suparti, & Dwikoranto, 2025). These three concepts form the basis for designing Arabic language learning that is oriented not only toward mastery of the material but also toward the contextual and productive application of knowledge.

The entire concept is directed at Future-Oriented Learning, which is in line with the OECD Learning Compass 2030 framework in preparing students to face changes and future needs through the development of knowledge, skills, attitudes, values, and student agency (Zaimarni, Asyhar, Asrial, & Syaiful, 2025). In this framework, *Maharah Kalam* is positioned as a core competency that is developed and measured through students' ability to use Arabic orally in meaningful and authentic situations, in line with the

communicative learning perspective developed by Jack C. Richards (Syafei, Ardiansyah, & Nugraha, 2025). Thus, the five concepts form a unified conceptual framework, namely Islamic Education as the foundation of values, Authentic Assessment as the orientation of assessment, STEAM Education as an integrative approach, Future-Oriented Learning as the direction of competency development, and *Maharah Kalam* as the language competency that is developed and measured.

In a study by Siregar and Baroroh, they examined authentic assessment of Arabic speaking skills through a video dialogue project for ninth-grade MTs students. The results showed that project-based assessment can assess communicative competence through project task, performance rubric, observation, self-assessment, and portfolios. This research is relevant because it both develops authentic, project-based assessments of *maharah kalam*, while the research to be conducted has the novelty of integrating STEAM and Artificial Intelligence through comic projects in Arabic language competency tests (Prasetyo & Baroroh, 2025). Research by Sumardi, 'Adzima, and Wijaya examines digital video projects as authentic assessments for assessing speaking skills. The assessment is conducted through aspects content, delivery, and creativity, and the results showed that the video project helped improve speaking fluency, vocabulary mastery, self-confidence, creativity, and reduce student anxiety (Sumardi, 'Adzima, & Wijaya, 2020). As for studied the use of comic media in Arabic language learning through systematic literature review the results show that comics can improve motivation, comprehension, and Arabic language skills, including reading, writing, and vocabulary mastery (Solihah, Mu'izzuddin, Aspandi, & Nurislamiah, 2025). STEAM-based Project-Based Learning (PjBL) model to improve students' critical thinking skills. The results showed that the integration of STEAM in the project significantly improved students' critical thinking skills (Purnamasari, Maftuh, & Hakam, 2026).

Previous research has shown that authentic assessment of the Arabic language through video projects, comic media, and STEAM-based PjBL has yielded positive results for speaking, creativity, and critical thinking skills. However, these studies have not integrated authentic assessment of the Arabic language, STEAM, Artificial Intelligence, and comic projects in the context of an Arabic language competency test. Therefore, this study fills this gap by developing an AI-assisted comic project-based assessment that integrates communication, creativity, critical thinking, and technological literacy competencies.

Based on the background and research gap as has been described, this research is directed to answer two main questions. *First*, how is the implementation of authentic STEAM-based *Maharah Kalam* assessment through an AI-assisted comic project in the Arabic language competency test? This question focuses on the project implementation process, the use of AI, the integration of STEAM elements, and the form of assessment of students' speaking skills. *Second*, how Artificial Intelligence-assisted comic projects support competency development future-oriented learning in the *Maharah Kalam* assessment? This question examines the extent to which the project process and product can provide space for students to develop communication, creativity, collaboration, critical thinking, and digital literacy.

Theoretically, this research contributes to the development of authentic assessment studies in Arabic language learning by broadening the understanding of the *Maharah Kalam* assessment, which is not only oriented towards conventional speaking performance, but also involves the process of creating works and utilizing technology. This research also offers an integration between STEAM, Artificial Intelligence, future-oriented learning, and Islamic educational values within a single Arabic language

assessment framework. Practically, this research provides an alternative model for the *Maharah Kalam* competency test through an AI-assisted comic project that is more contextual, creative, and performance-oriented. This model is expected to serve as a reference for Arabic language teachers and madrasahs in designing assessments that are able to measure communication skills while developing student competencies relevant to the demands of future education.

Methods

This study uses a qualitative approach with a case study design to gain an in-depth understanding of the implementation of authentic assessment *Maharah Kalam* STEAM-based through a comic book project Artificial Intelligence (AI) in the Arabic language competency test. The study was conducted at MTs 2 Nurul Islam Mojokerto, with 20 eighth-grade International Class Program (ICP) students taking the Arabic language competency test as subjects, as well as Arabic language teachers involved in the planning and implementation of the assessment. A case study design was chosen because the research focuses on real-life phenomena in a specific context, specifically how an AI-assisted comic project is implemented as part of the assessment *Maharah Kalam* and how students demonstrate oral communication skills through their products and performances (Poltak & Widjaja, 2024).

Data collection was conducted through observation, interviews, and documentation. Observations were used to directly observe the exam process, from comic book project development, AI utilization, student interactions, to presentations and performance *Maharah Kalam* (Septiana, Khoiriyah, & Shaleh, 2024). Interviews were conducted with Arabic language teachers to obtain information on the planning, objectives, procedures, and considerations in implementing project-based assessment. Interviews with students were used to explore their experiences in developing ideas, using AI, composing Arabic dialogues, and presenting project results. Documentation included AI-assisted comic products, presentation scripts, assessment rubrics, activity photos, and presentation videos. These data were used in an integrated manner to describe the process, products, and student performance in implementing authentic assessment.

Data analysis included data condensation, data presentation, and drawing and verifying conclusions (Septiana et al., 2024). In the condensation stage, data from observations, interviews, and documentation were selected and categorized based on research focus, such as STEAM implementation, AI utilization patterns, creativity in comic creation, Arabic language use processes, and performance *Maharah Kalam*. Next, the data is presented narratively and thematically to identify patterns, relationships, and trends that emerged during project implementation. Conclusions are then drawn based on the findings, which have been continuously analyzed and verified by comparing various data sources.

Data validity is maintained through technical triangulation, namely by comparing data from observations, interviews, and documentation (Nurfajriani, Ilhami, Mahendra, Sirodj, & Afgani, 2024). Information regarding the use of AI in the implementation of competency exams *Maharah Kalam* data was not only obtained through interviews but also confirmed through observations of the production process and examination of the comic products and student presentation videos. This way, the accuracy of the information can be verified through various data collection techniques, thereby strengthening the credibility of the research findings.

Results and Discussion

A. Implementation of STEAM-Based Authentic Maharah Kalam Assessment through AI-Assisted Comic Project

1. Implementation of Authentic Assessment *Maharah Kalam*

The implementation of authentic assessment of *maharah kalam* was carried out through a comic project assisted by Artificial Intelligence (AI) in the Arabic language competency test of eighth-grade International Class Program (ICP) students at MTs 2 Nurul Islam Mojokerto, involving 20 students. Comics were positioned as a stimulus and context for communication, not as the main object of assessment. The assessment was directed at obtaining evidence of students' ability to use Arabic orally through the process of script writing, comic development, presentation, and spontaneous responses.

a. Planning and implementing authentic tasks

Assessment design using the theme *الهواية* (*al-hiwāyah* (hobbies) that are close to the students' experiences. Students choose a hobby, develop a story idea, compose an Arabic dialogue, receive teacher feedback on vocabulary and sentence structure, and then develop the script into an AI-assisted comic. All 20 students follow these steps, including presentations and spontaneous responses. This series produces several pieces of assessment evidence: the script as evidence of linguistic readiness, the comic as a visual context, and the presentation and spontaneous responses as evidence of oral performance.

This condition is in accordance with the concept authentic assessment assesses abilities through meaningful tasks and the application of competencies in their intended context (Sumardi et al., 2020). Thus, students not only demonstrate theoretical mastery of vocabulary and structures but also use them to construct and convey messages. Furthermore, authentic assessment provides opportunities for students to apply knowledge and skills in relevant contexts (Rahmadani, 2024).

b. AI-assisted comics as a communication stimulus

The scripts were then visualized into comics with the help of AI. The results showed that the comics helped students remember characters, story sequences, activities, and dialogue during presentations. However, image quality, aesthetics, and AI sophistication were not used as the basis for assessment. The focus remained on students' ability to pronounce Arabic, use vocabulary and structure, and convey messages communicatively.

Theoretically, this position reinforces the principle of authentic assessment, which assesses competencies that are the learning objectives, not additional abilities that emerge through media use (Aisyah, 2025). The authenticity of the assessment lies not in AI technology, but in the task demands that require students to use Arabic to convey meaning. AI functions as enabler which strengthens the visual context and helps students organize ideas before communicating orally.

c. Presentation and spontaneous response as evidence *Maharah Kalam*

The main stage of the assessment is carried out through presentations of comic content and spontaneous questions, such as *مَتَى تُمَارِسُ هَوَايَتَكَ؟* and *مَا هَوَايَتُكَ؟*. The presentation measures the ability to use prepared language, while spontaneous responses measure the ability to understand questions and produce speech directly. Performance is assessed based on five aspects: pronunciation, fluency, vocabulary, grammar, and communication.

Table 1. Distribution of Authentic Assessment Results *Maharah Kalam*

Category	Value Range	Number of Students	Percentage
Very good	90–100	1	5%
Good	80–89	5	25%
Enough	70–79	8	40%
Need Guidance	<70	6	30%
Total		20	100%

The assessment results show a value *maharah kalam* was in the range of 59–92, with an average of 74.75. A total of 14 students (70%) obtained a score of ≥ 70 , while 6 students (30%) obtained a score of < 70 . The largest distribution was in the sufficient category with 8 students (40%), followed by the good category with 5 students (25%), very good with 1 student (5%), and needing guidance with 6 students (30%).

The data shows that the majority of students are able to use Arabic orally in the context of assigned tasks, but their abilities are not yet fully distributed. Students with higher scores are relatively able to maintain fluency, choose appropriate vocabulary, and convey stories coherently. Conversely, students with scores below 70 still show limited vocabulary, structural inaccuracies, and difficulty responding to situations that are not fully contained in the script.

The findings are relevant to the theory *Maharah Kalam* which views speaking as a productive skill that integrates vocabulary, structure, pronunciation, fluency, and the ability to convey meaning (Abdullah, Tarihoran, & Supardi, 2026). The difference between structured presentations and spontaneous responses also suggests that speaking ability is not solely measured through memorization. When questions are given spontaneously, students must comprehend the message, select vocabulary, construct a response, and deliver it directly. Therefore, spontaneous responses provide stronger evidence of students' actual communication abilities.

Overall, the average data of 74.75 and 70% of students achieving a score of ≥ 70 indicates that the AI-assisted comic project is capable of being a context that enables competency *maharah kalam* observed through actual performance. At the same time, the 30% of students who scored below 70 provided diagnostic information regarding areas that still need improvement, particularly fluency, vocabulary mastery, and spontaneous response skills. Thus, this assessment not only produces a score but also provides a picture of how students use Arabic in meaningful communication situations, which is a key characteristic authentic assessment.

2. STEAM Integration in Assisted Comic Projects Artificial Intelligence

The integration of Science, Technology, Engineering, Arts, and Mathematics (STEAM) in a comic project on the Arabic language competency test of eighth grade students of the International Class Program (ICP) of MTs 2 Nurul Islam Mojokerto is seen through the process of connecting student experiences, utilizing AI technology, story design, visual creativity, and organizing panels. Based on the results of observations, documentation of four comic products, and interviews with students,

the theme of الهواية (*al-hiwāyah*/hobbies) are developed into activities that are close to students' lives, such as football, shot put, volleyball, and watching football.

Interview results showed that students tended to choose hobbies they were familiar with or enjoyed because they were easier to develop into story ideas and Arabic dialogue. Students also explained that AI helped them visualize characters, settings, and activities they had previously imagined. However, when the resulting images didn't match their plans, students made changes or added words to their stories. Prompt observational findings show that students do not simply accept the AI's results, but compare the output with their initial ideas, find discrepancies in characters, settings, activities, or expressions, and then revise the instructions to achieve more appropriate results.

In the Science aspect, students utilize their experience and knowledge of sports activities as sources for story content. This aligns with the STEAM concept, which places empirical knowledge and experience as the basis for understanding phenomena and developing ideas (Purnamasari et al., 2026). Technology is evident through the use of AI to generate characters, settings, expressions, and scenes. Interviews indicate that AI helps students visualize their predetermined ideas, while observations show that students continue to make adjustments when the AI output does not match the design. Engineering is evident in the process of compiling, testing, evaluating, and revising prompt. Based on documentation and observation, the process takes place iteratively through the following stages:

Compiling instructions → generating output → identifying discrepancies → revising prompt → generate output again.

This pattern aligns with the engineering design process concept, which emphasizes iterative design, testing, evaluation, and refinement of solutions (Zhou, Xiong, & Obata, 2022). Interview results also showed that students added or changed words in prompt when the characters, settings, activities, or expressions generated by AI do not match the initial idea, so that the use of AI involves the process of thinking and problem solving, not just accepting the results of technology.

Next, Arts is realized through character design, facial expressions, movements, sports settings, speech bubble, and panel composition. This application is in accordance with the concept arts in STEAM, which emphasizes creativity, expression, aesthetics, and the delivery of ideas through visual representation (Lage-Gómez & Ros, 2024). In the comic project, artistic elements serve not only as decoration but also help students build atmosphere, clarify meaning, and support communication in Arabic. Meanwhile, mathematics is seen in the arrangement of the number of panels, the division of image and text space, and the systematic sequencing of scenes. This is in accordance with the STEAM principles that utilize the concepts of quantity, pattern, structure, and regularity in producing a product (Sari, Hasanah, & Barriyah, 2023). Thus, the five elements of STEAM are integrated in one process: science as a source of knowledge and experience, technology as a means of visualization, Engineering as a design and revision process, Arts as a medium of expression and storytelling, whereas Mathematics provide structure and order to comic products.

Table 2. The implementation of these five elements in four comic products



Comic 1



Comic 2



Comic 3



Comic 4

Table 3. Implementation of STEAM Elements in Comic Projects

Product	His/Her Hobby	Science	Technology	Engineering	Arts	Mathematics
Comic 1	Football	Knowledge of the match and teams	AI-assisted player and stadium visuals	Conversation flow → match → result	Character, expression, stadium speech bubble	6 panels and scene sequence
Comic 2	Bulletproof vest	Experience of training and sports activities	Field and character visuals	Training scene plan	Expression, movement, sports background	6 panel
Comic 3	Volleyball	Basic information about volleyball games and activities	Visuals of the field, players and ball	Order of service → attack → receive the ball → goal of the game	Game visuals and player expressions	6 panel
Comic 4	Watching football	Watching football and the experience of following the match	Visuals of sports characters and environments	Arranging the flow of conversation and activities	Characters, settings, panels, and storytelling	8 panel

Based on the table, the four products demonstrate that the five STEAM elements are not implemented separately, but rather integrated within a single comic creation process. Comic 1 utilizes students' knowledge of soccer matches, then visualizes it with AI and organizes it into a conversational flow leading up to the match's outcome. Comic 2 builds on the experience of shot put practice and develops it through the design of practice scenes. Comic 3 organizes volleyball knowledge into the sequence of serving, attacking, receiving, and the game's objectives. Meanwhile, Comic 4 develops the experience of watching soccer into a conversational flow and activities with eight panels.

The findings show that Science is a source of knowledge and experience, Technology is a means of visualization and exploration, Engineering is a process of design, testing, and revision, Arts is a medium of expression and storytelling, while Mathematics provides structure to the panels, proportions, and sequence of the story. This division of functions demonstrates the main characteristics of STEAM learning, which is interdisciplinary, namely integrating various fields of knowledge in one process to produce a specific solution or product. From a STEAM perspective, students do not study each discipline separately, but use concepts from various fields in an integrated manner when facing a task or problem (Barkah, Awaludin, & Bahtiar, 2024). Therefore, the comic creation process in this study can be seen as a STEAM activity because students use knowledge, technology, design processes, creativity,

and mathematical structures simultaneously to produce an Arabic-language communication product.

In the context of this research, this integration is strengthened by the use of Artificial Intelligence (AI), which functions as a cognitive and creative tool to help students transform abstract ideas into concrete visual representations (K., Vsudevan, & K.R., 2025). However, based on observations and interviews, students still play a role in determining ideas, developing prompts, evaluating AI output, and making revisions so that technology does not replace students' thinking processes. This condition aligns with the principles of project-based learning, which positions students as designers and creators of products through a process of exploration, problem-solving, evaluation, and refinement (Günzel & Brehm, 2024). Thus, the comic project not only produces an Arabic-language product but also demonstrates the integration of scientific thinking, technological literacy, design and problem-solving, artistic creativity, and the ability to organize information systematically. This integration makes Arabic language learning more contextual and meaningful because language skills are developed through product-creating activities that are close to students' experiences and interests.

3. Role Artificial Intelligence as Cognitive Tool in Arabic Language Assessment

Based on the results of observations, documentation, and interviews, Artificial Intelligence (AI) was used by students to develop characters, settings, expressions, activities, and storylines in comic projects with the theme *al-hiwāyah* students first define a story idea, then use AI to visualize it. Observations show that students compare the AI output with their initial design and make adjustments when characters, settings, activities, or situations don't quite match. In an interview, one student stated, "*AI helps create images that fit the story I have in mind*", while other students said that pictures helped them remember the content and sequence of the story when giving a presentation *Maharah Kalam*. Teachers also observed that students were more enthusiastic about developing assignments because they could see their ideas in visual form.

The use of AI also demonstrates a revision process. Observations show that when the AI output is not satisfactory, students change or add information to it prompt, especially regarding the characters, activities, settings, and situations of the story. One student stated, "*If the image doesn't fit, I change the prompt until the result fits the story better*". The teacher confirmed that students began comparing AI results with their intended goals and determining whether to use, improve, or reproduce them. Thus, the use of AI in projects is not straightforward or passive, but involves experimenting, comparing, evaluating, making decisions, and refining results.

However, the results of observations at the presentation stage showed that the use of AI had not automatically eliminated students' difficulties in *Maharah Kalam* some students still experience pauses when searching for vocabulary, using dialogue texts as a reference, and have difficulty developing stories spontaneously. The teacher explained that comics provide visual support for students, but speaking ability is still influenced by vocabulary mastery, language structure, pronunciation, fluency, and the ability to develop ideas verbally. Student interviews also indicated that images help remember story content, but do not completely overcome the difficulty in conveying messages spontaneously in Arabic.

The following is documentation of the presentation activities presented in the following image.

Figure 1. Documentation of the presentation activities presented



The image shows students presenting the results of their AI-assisted comic project to their teacher and other students. In this activity, comics are used as a visual medium to help students remember the plot, characters, and dialogue they have created. This documentation reinforces the observation that comic products don't stop at the creation stage but are used to support student performance in assessments *Maharah Kalam*.

As evidence of students' oral performance in the presentation stage, the following is an excerpt of the Arabic text used by students when presenting comics on the theme *al-hiwāyah*:

مَا هَوَايَتِي لَعِبُ كُرَةِ الْقَدَمِ. أَلْعَبُ مَعَ أَصْدِقَائِي فِي الْمَلْعَبِ بَعْدَ الْمَدْرَسَةِ. أَحِبُّ كُرَةَ الْقَدَمِ لِأَنَّهَا رِيَاضَةٌ مُفْتِئَةٌ. نَلْعَبُ مَعًا وَنَسْعُدُ عِنْدَمَا نَفُوزُ فِي الْمُبَارَاةِ.

أَحِبُّ رَمِي الْجُلَّةِ وَهِيَ هَوَايَتِي الْمَفْضَلَةُ. أَتَدْرَبُ فِي الْمَلْعَبِ مَعَ زُمَلَائِي. أَحَاوِلُ أَنْ أَرْمِيَ الْجُلَّةَ بَعِيدًا. هَذِهِ الرِّيَاضَةُ تُعَلِّمُنِي الصَّبْرَ وَالْقُوَّةَ.

هَوَايَتِي لَعِبُ كُرَةِ الطَّاوِرَةِ. أَلْعَبُ الْكُرَةَ مَعَ فَرِيقِي فِي الْمَلْعَبِ. أَحِبُّ الْمُبَارَاةَ لِأَنَّهَا تَحْتَاجُ إِلَى التَّعَاوُنِ بَيْنَ أَعْضَاءِ الْفَرِيقِ. أَشْعُرُ بِالْفَرَحِ عِنْدَمَا نَفُوزُ.

مِنْ هَوَايَاتِي مُشَاهَدَةُ كُرَةِ الْقَدَمِ. اسْتَمْتَعْتُ بِمُشَاهَدَةِ الْمُبَارَاةِ مَعَ أَسْرَتِي فِي الْبَيْتِ. أَشَجَّعُ فَرِيقِي الْمُفَضَّلَ وَأَفْرَحُ عِنْدَمَا يَفُوزُ. أَحْيَانًا أَشَاهِدُ الْمُبَارَاةَ مَعَ أَصْدِقَائِي.

The excerpt shows that students use comics as a visual context to convey experiences and ideas about hobbies in Arabic. The visuals of comics help students maintain the story's sequence, while their ability to convey messages verbally still relies on mastery of vocabulary, structure, pronunciation, and fluency.

These findings can be understood through the concept of AI as cognitive tool, namely technology used to support the thinking process, not replace students' cognitive activities (Pratama, Kharisma, & Nuryono, 2026). In AI-assisted learning, technology can provide representations, alternatives, and stimuli that help students explore ideas, while decisions regarding content, relevance, and product quality remain with the students. This is evident in this study when AI was used to visualize ideas about *al-hiwāyah*, while students still determine the theme, characters, plot, prompt, and evaluate and revise AI output. Thus, the use of AI not only produces images but also creates space for students to engage in cognitive processes such as planning, evaluation, decision-making, and problem-solving.

These findings also align with the AI-Assisted Learning perspective, which views AI as a technology that supports learning through personalization, idea exploration, visualization, and production (Gyonyoru & Katona, 2025). In the context of the comic project, AI's ability to generate visual representations helps bridge students' abstract ideas with concrete forms that can be used as learning aids visual support in presentation *Maharah Kalam*. However, research findings show that technological support is not synonymous with automatic improvement in linguistic competence. Pauses in speaking, reliance on dialogue text, and difficulty developing stories spontaneously indicate that the ability *Maharah Kalam* it still requires mastery of vocabulary, structure, pronunciation, fluency, and communication practice. Thus, AI serves as scaffolding, assisting with message preparation and organization, but it does not replace the need for students to actively practice using Arabic.

From a constructivist learning perspective, this process also demonstrates that students construct knowledge through the interaction of experience, technology, and product-creation activities (Adilah, Utaya, & Suharto, 2025). Students do not simply receive AI-generated images but connect these results to initial ideas, identify discrepancies, and then make revisions. This pattern demonstrates a reflective process in learning, as students evaluate the results based on established objectives. Therefore, AI's position in this study is more accurately understood as a cognitive tool and instructional support, while students remain the primary actors in determining the content and quality of the product and in communicating the results.

Thus, pedagogically, AI provides added value especially at the stages of idea development, visualization, story organization, and product evaluation, while competence *Maharah Kalam* still relies on students' active engagement in language practice. The teacher's role is crucial as a facilitator, guiding the use of AI to ensure it supports assessment objectives, rather than replacing the skills being measured. These findings confirm that the effectiveness of AI in Arabic language assessment lies not in the technology's ability to automatically generate results, but in how it is used to strengthen students' thinking and communication processes while maintaining the authenticity of the language skills being assessed.

B. Contribution of AI-Assisted Comic Projects to the Development of Future-Oriented Learning Competencies

1. Competency Development Future-Oriented Learning through assessment *Maharah Kalam*

Research findings show that the Artificial Intelligence (AI)-assisted comic project not only serves as a medium to assess the ability of *Maharah Kalam*, but also becomes a space to develop competencies needed in future-oriented learning. In the implementation of the Arabic language competency test for 20 eighth grade students of the International Class Program (ICP) MTs 2 Nurul Islam Mojokerto, students were involved in a series of activities that required them to develop ideas, compose stories, use Arabic, utilize AI, evaluate technological results, and present the products they had created. Thus, the competencies that emerged were not limited to mastery of linguistic elements, but developed into the ability to use language, technology, and creativity to produce a meaningful product.

Interviews with students further supported these findings. Students stated that using comics made it easier for them to develop ideas and provided visuals when telling stories in Arabic. Several students also noted that AI helped generate characters and settings they previously struggled to imagine, although they still needed improvement prompt when the results obtained are not as desired. These findings suggest that AI should not be viewed solely as a tool for generating images, but as a tool that aids in idea development, visualization, and problem-solving during product development.

Observations during the comic development process reinforced the interview findings. Students did not immediately receive the AI results, but compared the visual output with the initial design and made changes to the prompts when characters, settings, activities, or expressions were not appropriate. Students also arranged the sequence of scenes, matched images to dialogue, determined the position of speech bubbles, and divided the story into six to eight panels. These activities demonstrated the process of designing, testing, evaluating, and refining a product, reflecting the elements of Engineering. While the use of AI, visual development, and panel organization demonstrated the integration of Technology, Arts, and Mathematics elements. These findings reinforce the STEAM concept, which emphasizes cross-disciplinary integration through product creation, problem-solving, creativity, and the use of technology in meaningful contexts.

Communication competencies are developed through the presentation stage of comics in Arabic. Comics function as visual support which helps students organize ideas before conveying them verbally (Jannah, 2023). Students not only read dialogue but also explain characters, activities, plot, and story content based on the products they create. This provides a more meaningful communication context because students speak based on their own ideas and work. Meanwhile, creativity is seen in the diversity of ways students develop themes *al-hiwāyah* into characters, settings, situations, and storylines. The same theme can be realized in different stories based on each student's experience and imagination. Creativity is thus seen not only in the aesthetic aspects of comics, but also in students' ability to develop initial ideas into communication products with their own characteristics.

Critical thinking and problem-solving competencies are particularly evident in students' interactions with AI (Siregar, Pakpahan, & Ambarita, 2026). Students need to determine whether the AI's output aligns with the planned ideas, characters, settings, activities, and plot. When the results are not as expected, students make

adjustments prompt or repairing specific parts of a product. This process demonstrates the activity of evaluating, making decisions, and improving results based on predetermined objectives. Digital literacy develops through students' ability to use AI as a production tool, develop instructions that the system can understand, and critically select technological results (Siregar et al., 2026). Thus, students are positioned not as passive recipients of AI results, but as users who determine how technology is utilized to achieve learning objectives.

The findings can be summarized based on the evidence obtained during the assessment process as follows.

Table 4. Future-Oriented Learning Competency Achievements

Competence Research Findings		Number of Percentage Students	
Communicati on	Students are able to explain the contents of the comic, characters, activities, and storyline orally using Arabic.	14	70%
Creativity	Students develop themes <i>al-hiwāyah</i> into diverse characters, settings, dialogues, and visual plots.	16	80%
Critical Thinking	Students evaluate the suitability of the AI output to the ideas, characters, setting, and storyline before deciding which output to use.	12	60%
Digital Literacy	Students use AI as a visual production tool and select and adjust the technology's output.	15	75%
Problem Solving	Students make revisions prompt or products when the AI results do not match the initial design.	11	55%
Confidence	Comics as visual support help students be more prepared to convey stories in front of teachers or audiences.	13	65%

Based on the assessment results of 20 eighth-grade International Class Program (ICP) students, the Artificial Intelligence (AI)-assisted comic project demonstrated a contribution to the development of future-oriented learning competencies with varying levels of achievement. Creativity was the competency with the highest achievement, namely 16 students (80%), followed by digital literacy with 15 students (75%), communication with 14 students (70%), confidence with 13 students (65%), critical thinking with 12 students (60%), and problem solving with 11 students (55%). These achievements indicate that students are relatively more capable of developing creative ideas and utilizing technology compared to conducting critical evaluations and solving obstacles independently. In the aspect of creativity, students are able to transform themes *al-hiwāyah* into diverse characters, settings, dialogues, and visual plots, while in the digital literacy aspect, students are able to utilize AI through the compilation prompt, output selection, and product customization as needed.

Based on this data, the comic project not only functions as an assessment product *Maharah Kalam*, but also creates a learning process that demands cognitive engagement and broader skills. Communication develops through comic

presentations in Arabic, as students explain the characters, activities, and storylines based on the products they develop. Confidence is supported by the presence of comics as a learning tool visual support which provides a reference when students convey ideas orally. Meanwhile, critical thinking and problem solving emerge when students evaluate AI output and make revisions to it prompt or products that do not conform to the initial design. Lower achievement in both competencies indicates that the ability to use technology is not always accompanied by the ability to independently evaluate and control the technology's results. Therefore, interaction with AI in learning requires scaffolding teachers so that students are not only technology users, but also able to make decisions based on logical considerations and learning objectives.

Furthermore, this aligns with the Future-Oriented Learning perspective, which positions learning as a process of preparing students to face change, complexity, and uncertainty in the future through developing the ability to create, communicate, think critically, solve problems, and use technology meaningfully (Muliadi & Nasri, 2023). In this project, students experience a series of activities: developing ideas, creating products, using AI, evaluating outputs, revising, and presenting results, making the assessment process a future-oriented learning experience. Therefore, the integration of AI in assessment *Maharah Kalam* it doesn't merely enhance the technological aspects of learning, but rather expands the assessment function into a space for developing competencies relevant to students' future needs. However, the variation in achievement across competencies confirms that the success of Future-Oriented Learning is not determined solely by the use of AI, but rather by a pedagogical design that positions students as creators, evaluators, decision-makers, and problem-solvers in the learning process.

2. Implications for the Transformation of Islamic Education and Future-Oriented Learning

The research results show that the implementation of authentic STEAM-based assessment and Artificial Intelligence (AI) has several important implications for the transformation of Islamic education and the development of future-oriented learning. These implications can be formulated as follows:

a. Transforming exams from memorization to authentic performance

Arabic language assessments have shifted from a predominantly vocabulary memorization, structure, and question-answering skills to authentic performance that places students in more meaningful communication situations. Through the comic project, students are not only asked to produce answers but also to determine themes *al-hiwāyah*, developing ideas, constructing dialogue, designing a flow, using AI, making revisions, and presenting results in Arabic. Thus, the assessment demonstrates how students apply language knowledge and skills to produce a directly observable product.

b. Strengthening student-centered learning

The comic project provides more space for students to be active subjects in the learning process. Based on observations and interviews, students are involved in determining the topic, selecting experiences to develop, designing characters and stories, and composing prompt, evaluating AI output, and determining the final form of the product. Teachers are no longer the sole source of information, but rather act as facilitators, providing direction, guidance, and feedback. This approach encourages student independence, creativity, and responsibility for the learning process and outcomes.

c. Responsible integration of technology in Islamic education

The use of AI in this study demonstrates that technology can be integrated into learning without diminishing the value and goals of Islamic education. AI is used as a tool, not a substitute for students' thinking or language skills. Students are still guided to evaluate the AI's results and improve them prompt, selecting appropriate outputs, and being responsible for the resulting products. In the context of Islamic education, this pattern is crucial because digital transformation requires not only technological proficiency but also ethical awareness, responsibility, and the ability to control the use of technology in accordance with educational goals.

d. Developing 21st century competencies without shifting the objectives of Arabic language learning

The integration of STEAM and AI allows students to develop various competencies such as creativity, communication, critical thinking, problem solving, digital literacy, and confidence simultaneously with the ability *Maharah Kalam* although students use technology to produce visuals and develop products, assessment success remains tied to their ability to use Arabic appropriately, including vocabulary mastery, structure, pronunciation, fluency, and the ability to convey ideas. Thus, technology serves to expand the learning experience, not replace the substance of Arabic language learning.

e. Strengthening principles Future-Oriented Learning

The comic book project demonstrates a learning style that prepares students for future needs through a series of processes: developing ideas, designing products, utilizing technology, evaluating information, solving problems, making improvements, and communicating results. This process provides students with experience in confronting discrepancies and making decisions based on established goals. Therefore, learning is not only oriented toward achieving final results but also toward developing students' capacity to adapt and generate solutions in dynamic situations.

f. Development of an innovative assessment model for the transformation of Islamic education in the AI era

Overall, authentic STEAM and AI-based assessments have the potential to become innovative evaluation models that integrate language, technology, creativity, problem-solving, and communication skills into a single learning experience. This model demonstrates that transforming Islamic education in the AI era does not mean replacing values, the role of teachers, or learning objectives with technology, but rather using technology pedagogically to strengthen students' capacities. With this approach, assessment can evolve from a mere measurement instrument to become part of the educational process that prepares students to become creative, critical, communicative, adaptive, and responsible learners in the face of technological change and future demands.

Based on the overall findings, authentic STEAM-based assessment and Artificial Intelligence (AI) demonstrate that Arabic language evaluation can be transformed into a contextual, creative, and future-oriented learning experience. The comic project not only measures students' abilities, but also their ability to *Maharah Kalam*, but also provides space for students to develop creativity, communication, critical thinking, problem solving, digital literacy, and confidence through the process of designing, creating, evaluating, revising, and presenting products. AI functions as *cognitive tool* which helps visualize and develop ideas, while the STEAM approach strengthens the connection between technology, experience, creativity, and the design process (Pratama et al., 2026).

From a Future-Oriented Learning perspective, these findings confirm that assessment can function simultaneously as a learning experience that prepares students for future changes and demands (Muliadi & Nasri, 2023). Therefore, the integration of STEAM and AI can be an alternative, innovative assessment model in the transformation of Islamic education, while still prioritizing Arabic language skills, active student involvement, teacher mentoring, and the critical, ethical, and responsible use of technology as essential parts of the learning process.

Conclusion

Based on the research results, it can be concluded that the implementation of authentic assessment *Maharah Kalam* a STEAM-based learning project using Artificial Intelligence (AI) comics provided a contextual and meaningful Arabic language assessment. The assessment was conducted through script writing, comic development, presentations, and spontaneous responses. The results showed that 14 out of 20 students (70%) achieved a score of ≥ 70 with an average of 74.75, enabling the comic project to provide a context that allows for the observation of speaking skills through real-life performance. STEAM integration was evident through the integration of students' experiences and knowledge, the use of AI technology, and the design and revision process prompt, visual creativity, and the organization of panels and storylines. AI acts as cognitive tool which helps visualization, idea development, and story organization, but does not replace students' thinking processes or language skills. In addition, comic projects contribute to the development of competencies *future-oriented learning*, with the highest achievement at creativity (80%), digital literacy (75%), communication (70%), confidence (65%), critical thinking (60%), and problem solving (55%). These findings indicate that authentic STEAM and AI-based assessments not only serve to measure *Maharah Kalam*, but also a learning experience that develops creativity, communication, digital literacy, critical thinking, problem-solving, and self-confidence. Thus, the integration of STEAM and AI has the potential to become an alternative, innovative assessment model for transforming Islamic education in the AI era, while maintaining Arabic language proficiency as the primary objective, students as active actors, teachers as facilitators, and the critical, ethical, and responsible use of technology.

References

- Abdullah, W., Tarihoran, N., & Supardi. (2026). Advancing sustainable islamic management education through education for sustainable development. *Discover Sustainability*, 7(257). <https://doi.org/https://doi.org/10.1007/s43621-025-02571-1>
- Adilah, G. P., Utaya, S., & Suharto, Y. (2025). Pengaruh Model Resource Based Learning Berbantuan Microsite Terhadap Hasil Belajar Ditinjau Dari Motivasi Belajar Siswa. *Jayapangus Press Cetta: Jurnal Ilmu Pendidikan*, 8(1). <https://doi.org/https://doi.org/10.37329/cetta.v8i1.3859>
- Aisyah, N. R. (2025). Rekonstruksi Model Penelitian Tafsir: Metode dan Pendekatan dalam Memahami Makna Al-Qur'an. *Jurnal Semiotika-Q*, 5(1). <https://doi.org/https://doi.org/10.19109/jsq.v5i1.25815>
- Al Momani, H. A. (2024). Linguistic Communication and Its Effect on Teaching Arabic to Non-native Speakers. *Dirasat: Human and Social Sciences*, 51(5), 481. <https://doi.org/10.35516/hum.v51i5.4120>
- Alsaied, M. A. (2024). The Contribution of Artificial Intelligence Technologies in Refining the Arabic Language Skills of Its Native Speakers: Achieved and Possible. *Journal*

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of Ecohumanism, 3(8). <https://doi.org/10.62754/joe.v3i8.5126>
- Badawi, S. A., Takruri, M., & Salameh, K. (2026). AI-Based Framework for Arabic Language Proficiency Assessment: A Deep Learning ASR Model with Enhanced Similarity Measures. *Future Internet*, 18(5). <https://doi.org/10.3390/fi18050251>
- Barkah, E. S., Awaludin, D., & Bahtiar, M. I. E. A. (2024). Implementasi Model Pembelajaran STEAM (Science, Technology, Engineering, Art and Mathematics): Strategi Peningkatan Kecakapan Abad 21. *Jurnal Syntax Admiration*, 5(9). <https://doi.org/https://doi.org/10.46799/jsa.v5i9.1497>
- Günzel, H., & Brehm, L. (2024). A Roadbook for the Professionalization of Project-based Learning Courses. *10th International Conference on Higher Education Advances (HEAd'24)*. <https://doi.org/10.4995/HEAd24.2024.17194>
- Gyonyoru, K. I. K., & Katona, J. (2025). Comprehensive Overview of the Concept and Applications of AI-based Adaptive Learning. *Acta Polytechnica Hungarica*, 22(3). <https://doi.org/10.12700/APH.22.3.2025.3.9>
- Jannah, K. (2023). Problematika Pembelajaran Maharah Kalam Pada Program Pengembangan Bahasa Asing Pondok Pesantren Ngalah Purwosari. *Impressive: Journal of Education*, 1(2), 66. <https://doi.org/https://doi.org/10.61502/ijoe.v1i2.12>
- K., K., Vsudevan, A., & K.R., S. (2025). AI-Enabled Creativity: Effects on Divergent and Convergent Thinking among Higher Education Students. *International Journal of Engineering Pedagogy*, 15(7). <https://doi.org/10.3991/ijep.v15i7.59051>
- Lage-Gómez, C., & Ros, G. (2024). On the interrelationships between diverse creativities in primary education STEAM projects. *Thinking Skills and Creativity*, 51. <https://doi.org/10.1016/j.tsc.2023.101456>
- Mardhotillah, A. D., & Syarifah, A. (2025). Implementasi Pembelajaran Bahasa Arab Berbasis Digital pada Kurikulum Berbasis Kompetensi di Madrasah Tsanawiyah. *Tarbiyatuna: Jurnal Pendidikan Ilmiah*, 10(2). <https://doi.org/https://doi.org/10.55187/tarjpi.v10i2.6354>
- Muharom, A. (2025). Inovasi Pembelajaran Bahasa Arab Berbasis Artificial Intelligence: Analisis Platform NahwuAI dan Implikasinya Terhadap Tradisi Nahwu-Sharaf Pesantren. *Proceeding of International Conference on Islamic Education (ICIED)*, 10(1). <https://doi.org/https://doi.org/10.18860/icied.v10i1.3696>
- Muliadi, E., & Nasri, U. (2023). Future-Oriented Education: The Contribution of Educational Philosophy in Facing Global Challenges. *Jurnal Ilmiah Profesi Pendidikan*, 8(4). <https://doi.org/10.29303/jipp.v8i4.1807>
- Nurfajriani, W. V., Ilhami, M. W., Mahendra, A., Sirodj, R. A., & Afgani, M. W. (2024). Triangulasi Data Dalam Analisis Data Kualitatif. *Jurnal Ilmiah Wahana Pendidikan*, 10(17). <https://doi.org/10.5281/ZENODO.13929272>
- Poltak, H., & Widjaja, R. R. (2024). Pendekatan Metode Studi Kasus dalam Riset Kualitatif. *Local Engineering: Journal of Local Architecture and Civil Engineering*, 2(1). <https://doi.org/https://doi.org/10.59810/lejlace.v2i1.89>
- Prasetyo, A. A., & Baroroh, U. (2025). Authentic Assessment Tool For Speaking Skills Through A Ninth Grade Video Dialogue Project. *ARKHAS: Jurnal Bahasa Arab*, 5(2). <https://doi.org/https://doi.org/10.35719/arkhas.v5i2.2345>
- Pratama, G., Kharisma, & Nuryono, W. (2026). Pengaruh Adiksi AI Terhadap Kemampuan Berpikir Kritis Siswa. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, 12(2). <https://doi.org/https://doi.org/10.36989/didaktik.v12i02.15767>
- Purnamasari, R., Maftuh, B., & Hakam, K. A. (2026). Steam-Based PjBl (Project-Based Learning) Model to Improve Critical Thinking Character of Elementary School. *Journal of Educational Sciences*, 10(1).

- <https://doi.org/https://doi.org/10.31258/jes.10.1.p.602-616>
- Rahmadani, N. (2024). Meningkatkan Kualitas Pembelajaran Melalui Asesmen Efektif di Era Kurikulum 2013. *Perspektif: Jurnal Pendidikan Dan Ilmu Bahasa*, 2(3). <https://doi.org/https://doi.org/10.59059/perspektif.v2i3.1452>
- Sa'adah, N., Armadani, W. W., & Kholilurrahman, M. (2026). Problematika Evaluasi Pembelajaran Bahasa Arab Berbasis Digital. *Protasis: Jurnal Bahasa, Sastra, Budaya & Pengajarannya*, 5(1). <https://doi.org/https://doi.org/10.55606/protasis.v5i1.270>
- Sari, D. P., Hasanah, D., & Barriyah, I. Q. (2023). Model Pembelajaran Berbasis STEAM Proyek untuk Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Siswa. *Edukasi: Jurnal Penelitian Dan Artikel Pendidikan*, 15(2). <https://doi.org/10.31603/edukasi.v15i2.10489>
- Septiana, N. N., Khoiriyah, Z., & Shaleh. (2024). Metode Penelitian Studi Kasus Dalam Pendekatan Kualitatif. *Didaktik: Jurnal Ilmiah PGSD STKIP Subang*, 10(4). <https://doi.org/https://doi.org/10.36989/didaktik.v10i04.5181>
- Setiani, R., Widiasih, Suparti, & Dwikoranto. (2025). Analysis of Student Creativity Assessment Instruments: Supporting SDGs and MBKM in Higher Education. *IJORER: International Journal of Recent Education Research*, 6(1). <https://doi.org/https://doi.org/10.46245/ijorer.v6i1.746>
- Siregar, N., Pakpahan, R. A., & Ambarita, Y. (2026). Eksplorasi Makna Efektifitas Penggunaan AI Pada Pembelajaran Problem Solving: Perspektif Etika Siswa SMA. *Jejak Digital: Jurnal Ilmiah Multidisiplin*, 2(1). <https://doi.org/https://doi.org/10.63822/k2wqcg60>
- Solihah, S. N., Mu'izzuddin, Moch., Aspandi, & Nurislamiah, S. (2025). The Utilization of Comic Media for Arabic Language Learning in Indonesia. *Al-Muyassar: Journal of Arabic Education*, 4(2). <https://doi.org/https://doi.org/10.31000/al-muyassar.v4i2.13821>
- Sumardi, 'Adzima, R., & Wijaya, A. N. (2020). Digital Video Project: An Authentic Assessment to Assess Students' Speaking Skills. *Indonesian Journal of EFL and Linguistics*, 5(1). <https://doi.org/https://doi.org/10.21462/ijefl.v5i1.217>
- Syafei, I., Ardiansyah, A. A., & Nugraha, D. (2025). The Communicative Approach in Arabic Language Learning (Theoretical and Practical Perspectives). *International Conference on Language Learning and Literature (ICL3)*, 55(1). <https://doi.org/https://doi.org/10.15575/gdcs.v55i1.2906>
- Yuwono, A. A., & Nurhuda, A. (2024). Warisan Al-Attas: Menghidupkan Kembali Islamisasi Ilmu untuk Pendidikan Masa Depan. *At-Tarbawi: Jurnal Kajian Kependidikan Islam*, 9(2). <https://doi.org/https://doi.org/10.22515/attarbawi.v9i2.10261>
- Zaimarni, Asyhar, R., Asrial, & Syaiful. (2025). Analisis Kurikulum Sekolah Menghadapi Era Disrupsi. *Jurnal Perspektif Pendidikan*, 19(2). <https://doi.org/https://doi.org/10.31540/jpp.v19i2.3823>
- Zhou, T., Xiong, W., & Obata, Y. (2022). Digital product design and engineering analysis techniques. *Elsevier*. <https://doi.org/10.1016/B978-0-323-95062-6.00003-6>