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Technology Integration in Arabic Language Curriculum from a TPACK Perspective: A Case Study in an Islamic State High School

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Abstract

This study aims to identify technology integration in the curriculum and analyze the Arabic language learning process within the TPACK framework. This research method uses a qualitative approach with a case study design, based on in-depth interviews with 21 informants, which are then strengthened by field observations and document analysis. The study was conducted at Madrasah Aliyah Negeri (MAN) 2, Malang City, Indonesia. The research results show that technology integration in the curriculum strengthens three main dimensions: learning planning, material management, and learning evaluation. Technology helps develop modules, map objectives, coordinate teachers, organize materials, update learning resources, and accelerate assignments, assessments, and feedback. The findings also demonstrate the use of digital platforms such as LMS and Edu-Panda, the Digital Madrasah Report, and the institutional commitment to the Digital Madrasah policy. In Arabic language learning, the TPACK framework illustrates the integration of content mastery, pedagogical strategies, and technology utilization in the delivery of materials, classroom interactions, and assignment management. The study emphasizes that technology integration is not only technical but also curricular, pedagogical, and institutional. The implications of this study emphasize the need for madrasas to strengthen teachers' competencies and continuously optimize their digital platforms to support current developments.

A. Introduction

Technological transformation in the educational curriculum is a strategic need to respond to changes in learning characteristics in the digital era, including in Islamic education (Fidayani & Ammar, 2023). In Arabic language learning, the use of technology is not sufficiently understood as a complement to teaching media; rather, it must be integrated harmoniously with curriculum objectives, language materials, and pedagogical approaches (Agung Heru Setiadi et al., 2024). The Technological Pedagogical Content Knowledge (TPACK) framework provides a foundation for understanding such integration more systematically (Santos & Castro, 2021). Therefore, strengthening the Arabic curriculum by integrating technology, pedagogy, and content is important to achieve effective, adaptive learning (Aziz et al., 2024).

Although technology is increasingly used in education, implementing the Arabic language curriculum in schools and madrassas continues to face various obstacles. In many cases, the use of technology tends to be technical-instrumental. It has not been systematically integrated with the curriculum objectives, language materials, and appropriate pedagogical approaches (Haddade et al., 2024). As a result, Arabic learning risks occurring without alignment among content, methods, and technology. This situation shows a fundamental problem with how technology is effectively integrated into the Arabic curriculum (Ahmadi & Saad, 2024).

The integration of technology in the curriculum is understood as the process of aligning its use with learning goals, content, and practices, so that technology is not merely an additional tool but part of pedagogical changes that encourage more meaningful, student-centered learning (Morehouse, 2020). Learning Arabic is the process of developing four language skills (listening, speaking, reading, and writing) to understand the Qur'an and hadith, and as a means of communication (Sya'diah et al., 2024). Meanwhile, the TPACK framework explains that effective learning with technology integration is built through the integration of technological knowledge, pedagogy, and content (Phillips et al., 2025).

Research on integrating technology into language learning has grown significantly, but there remains a significant gap in the context of the Arabic curriculum in high school. Theoretically, many studies address Arabic education or learning technology separately, without linking them in a comprehensive TPACK framework (Nisa et al., 2025). In addition, previous studies have more often used a general descriptive analysis approach and have not specifically examined the relationship between TPACK components in Arabic curriculum design, suggesting that the evidence remains relatively limited (Majid et al., 2023).

In addition, various studies on the effectiveness of technology integration in language learning provide a consistent picture for the optimal development of the Arabic curriculum. Some studies emphasize increased motivation to learn, which, in turn, makes the success of technology use in learning highly dependent on teacher readiness, facilities, and institutional support (Ritonga et al., 2024; Sarah et al., 2024). From a practical perspective, there are still few studies that produce operational recommendations for high schools in designing an Arabic curriculum that combines content knowledge, pedagogy, and technology in a balanced and sustainable manner (Siregar, 2025).

Overall, this study lies in an integrated analysis between the integration of curriculum technology and the implementation of TPACK in Arabic language learning in public Islamic schools. Unlike previous research, which generally separated aspects of curriculum, media, and teacher competence, this study shows the interconnectedness of planning, material management, digital evaluation, and institutional support in the Digital Madrasah.

This research aims to identify the integration of technology into the curriculum and to analyze the Arabic language learning process within the TPACK framework. The study was conducted at Madrasah Aliyah Negeri (MAN) 2, Malang City, East Java, Indonesia. The contribution of this research lies in presenting a technology integration model that not only explains the use of digital media in Arabic language learning but also shows the interconnectedness among planning, material management, evaluation, digital platforms, and institutional support through the TPACK framework at the high school level. This research expands understanding of the success of technology integration as determined by the synergy among teacher competencies, learning practices, and the sustainable transformation of educational institutions, both in Indonesian and global contexts.

B. Method

This study uses a qualitative case study design (Woodside, 2010). This approach was chosen to allow an in-depth examination of the process of integrating technology in Arabic language teaching through the lens of TPACK at MAN 2 Malang. This research was conducted over five months, from November 2025 to March 2026. The informants participating in this research included the head of the madrasah, the curriculum officer, and the infrastructure officer, totaling three Arabic teachers; 15 eleventh-grade students then corroborated this through a Focus Group Discussion (FGD).

Data was collected through 3 live classroom observations, in-depth interviews, and document analysis. The researcher acts as the main instrument, supported by interview guidelines, observation protocols, and field notes. Data analysis follows a thematic analysis procedure, which involves data reduction, data presentation, and conclusion drawing (Miles et al., 2020). The validity of the data is strengthened through triangulation of sources and techniques, as well as through checks with members to ensure the accuracy of the information obtained. The study is expected to provide a rich description of the strategies, challenges, and opportunities involved in integrating TPACK-based technologies into Arabic language instruction at the high school level.

C. Findings and Discussion

Integration of Technology in the Curriculum at MAN 2 Malang City

The integration of the MAN 2 Malang City curriculum shows that technology serves as a means of supporting learning. In strengthening learning planning, technology helps teachers prepare teaching materials, develop activity flows, and adjust learning strategies to students' needs. As obtained from interviews.

> *"Learning plans are carried out by preparing modules, mapping goals, and scheduling learning activities, which are further helped through the use of digital devices, so that teachers can more easily design measurable learning and are responsive to needs."* (Head of Madrasah)

> *"Madrasah emphasizes the use of technology to facilitate coordination between teachers in preparing teaching materials and evaluation tools, so that learning planning is more collaborative, consistent, and documented in an administratively sustainable manner."* (Deputy Head of Curriculum)

In material management, technology is understood as a means to organize, store, and present teaching materials more effectively. The findings of the interviews show that the material can be accessed, updated, and adjusted to students' abilities in a more efficient and targeted manner. As obtained from interviews.

> *"The use of digital media helps teachers group material based on themes, skills, and levels of difficulty, so that the presentation of teaching materials becomes more systematic, varied, and easy for students to understand in learning."* (Head of Madrasah)
>
> *"Technology is used to make it easier for teachers to update materials according to the learning context, add additional learning resources, and combine text, audio, and visuals to strengthen students' language understanding gradually."* (Deputy Head of Infrastructure)

Learning evaluation support: technology helps implement assessments more accurately, quickly, and thoroughly. The use of digital media makes it easier to assign assignments, monitor progress, and systematically and sustainably archive student learning outcomes in the madrasah environment. As obtained from interviews.

> *"Learning evaluation is easier to do because teachers can share assignments, check results, and record learning progress through digital platforms in a more practical and well-documented way."* (Head of Madrasah)
>
> *"Technology integration helps teachers get learning feedback faster, so that learning follow-up can be done more appropriately according to the needs of students at each meeting."* (Deputy Head of Curriculum)

As the above explanation is supported by observation, it shows that digital platforms such as LMS, Edu-Panda, and Madrasah Digital Report Cards have been used for planning, delivering materials, and evaluating learning. In addition, the institutional document affirms the commitment to information technology-based governance, which is strengthened by the presence of the P3TIM unit as a driver of the madrasah digital system's development.

> "On the other hand, on January 22, 2023, the Minister of Religious Affairs of the Republic of Indonesia *inaugurated* the MAN 2 Integrated Madrasah in Malang City as a 'Digital Madrasah'. It aims to adapt to the IT-centric era to support learning and work services (Humas MAN., 2023). On July 23 2025. MAN 2 Malang City shows its commitment to realizing technology-based madrasas through strengthening digital learning facilities. This digital transformation is carried out gradually and comprehensively, in line with the activities of Matsama (Ta'aruf Period for Madrasah Students) and OPENABA (Orientation for New Member Admission) Scouts for Class X Students"(Humas MAN., 2025).

Figure 1. Digital Madrasah: MAN 2 Malang City Presents 47 Smart IT Board-Based Classrooms

To summarise the data findings, the researchers present them in the table below:

Table 1. Curriculum Integration in the Use of Learning Technology

Aspects	Findings	Target
Learning Planning	Technology helps teachers' modules, objectives, schedules, and coordination	More systematic, collaborative, and digitalized planning
Material Management	The material is more organized, easy to update, and varied	The material is more effective, accessible, and according to the needs of students
Learning Evaluation	Tasks, results, and feedback are faster and documented	More efficient, measurable, and optimal evaluation
Platform Digital	LMS, Edu-Panda, and RDM are used in learning	Optimal digital platforms as learning supports
Institutional Commitment	Digital Madrasah	Continuous digital transformation of madrasas

To make the table data easier to understand, the researcher presented it in a picture, as shown below.

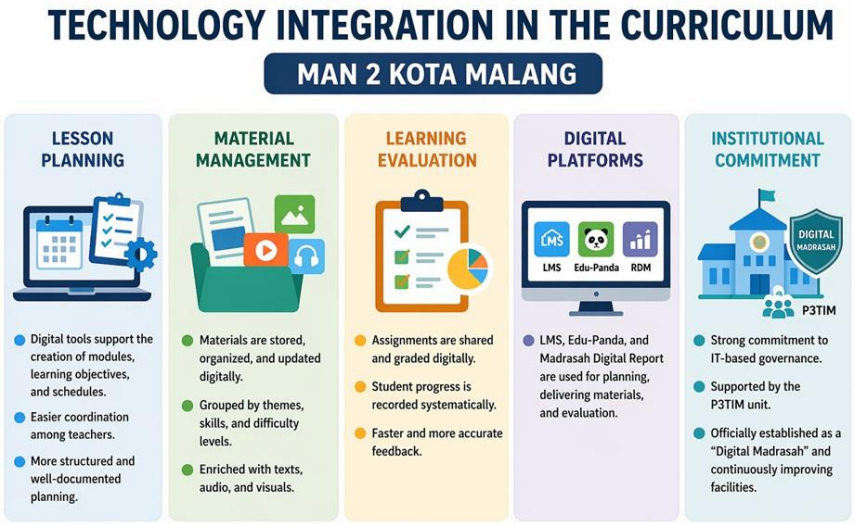

Figure 2. Integration of Digital Services in Learning

According to Richlin (2023), the use of technology in learning planning contributes to strengthening a more structured, collaborative, and measurable

learning design. In the context of curriculum development, the digitalization of planning makes it easier for teachers to compile modules, formulate goals, set schedules, and coordinate more effectively (Dadmehr et al., 2026). As research by Yurtseven Avci et al. (2020) shows, the use of technology during planning can increase the consistency of learning tools, strengthen teacher professional collaboration, and simplify document management. Therefore, technology supports learning planning that is more responsive to students' needs and contemporary educational dynamics.

Technology-supported material management shows that teaching materials that are neatly arranged, easy to update, and diverse can expand access while increasing the suitability of learning content. Technology provides space for teachers to organize materials more flexibly based on the theme, level of difficulty, and learning needs of students. Research , digital media can enrich the presentation of materials through text, audio, visual, and online learning resources that make learning more engaging, clear, and easy to understand to increase efficiency, but also support more differentiated and responsive learning.

Technology-supported material management shows that teaching materials that are neatly arranged, easy to update, and diverse can expand access while increasing the suitability of learning content. Technology provides teachers with greater flexibility to organize materials based on the theme, level of difficulty, and students' learning needs (Goodson, 2021). According to Zhang (2024) research, digital media can enrich the presentation of materials through text, audio, visual, and online learning resources that make learning more engaging, clear, and easy to understand, thereby increasing efficiency and also supporting more differentiated and responsive learning.

On the other hand, the process of learning evaluation activities that utilize technology and digital platforms shows a shift from traditional assessment patterns to a more effective, measurable, and well-documented system. Through technology, teachers can share assignments, assess learning outcomes, and provide feedback more quickly, regularly, and systematically. In research, digital platforms, such as LMS and academic reporting systems, can improve the quality of evaluations while facilitating the monitoring of student development. In the institutional context, commitment to digital transformation is an important factor that maintains the sustainability of implementation, supports learning and institutional governance policies in response to the times

On the other hand, the process of learning evaluation activities that utilize technology and digital platforms shows a shift from traditional assessment patterns to a more effective, measurable, and well-documented system. Through technology, teachers can share assignments, assess learning outcomes, and provide feedback more quickly, regularly, and systematically (Sharon Smaldino et al., 2024). In Veluvali & Surisetti (2022) research, digital platforms, such as LMSs and academic reporting systems, can improve evaluation quality while facilitating monitoring of student development. In the institutional context, commitment to digital transformation is an important factor that sustains implementation and supports learning and institutional governance policies in response to the times (Fandi Asy'arie et al., 2024).

Arabic Language Learning with TPACK Framework at MAN 2 Malang City

Arabic learning activities demonstrate integration among mastery of materials, pedagogical strategies, and the use of technology. Learning practices are not only oriented to the delivery of lesson content but also to the effective, contextual, and adaptive teaching of material to students' needs. This integration aligns with the TPACK framework and the relationships among these components in Arabic learning practice.

1. **Content Knowledge (CK)**

Teachers have adequate mastery of Arabic material. This mastery is evident in the teacher's ability to compile material systematically, starting with mufradat, qawaid, maharah, and learning objectives. The material was taught sequentially and adjusted to students' abilities as the interview progressed.

> *"Arabic material is arranged in stages from mufradat, qawaid, maharah, to application exercises, so that students understand the content of the lesson."* (Teacher A)
>
> *"Mastery of content is needed so that the material is delivered coherently, according to learning objectives, academic needs, and students' ability levels."* (Teacher B)
>
> *"The teacher conveys the material taught in order, starting from vocabulary and language structure, then continuing with exercises in learning."* (Student FGD)

2. **Pedagogical Knowledge (PK)**

Teachers have the knowledge and competence not only to rely on lecture methods, but also to apply a varied approach. This is done by gradually managing learning, from opening lessons and explaining material to giving opportunities to ask questions, providing exercises, and closing the learning with reflections or assignments to strengthen student understanding. As obtained from interviews.

> *"Learning is carried out through explanations, questions and answers, exercises, and reflection so that students remain active during the learning process."* (Teacher C)
>
> *"Class management is carried out in stages, starting from opening, delivering material, exercises, and assignments to strengthen understanding."* (Teacher A)
>
> *"Class management is carried out in stages, starting from opening, delivering material, exercises, and assignments to strengthen understanding."* (Teacher A)
>
> *"The method used by teachers is not only to lecture, but also to provide opportunities to ask questions, discuss, and work on exercises together."* (Student FGD)

3. **Technology Knowledge (TK)**

In this context, teachers have recognized and incorporated technology into Arabic instruction. This utilization can be seen through the use of projectors, presentation materials, online media, and madrasah learning platforms to support the distribution of materials, assignments, and learning communication more effectively. As obtained from interviews.

"*Learning using presentation media, projectors, and madrasah platforms is used to deliver materials and distribute assignments to students.*" (Teacher B)

"*The use of technology helps learning communication, especially in the delivery of materials, assignments, and access to digital learning resources.*" (Teacher C)

"*Sometimes, teachers often use projectors and digital presentation materials so that learning feels clearer and more engaging.*" (Student FGD)

4. Pedagogical Content Knowledge

In this regard, teachers can adjust their teaching strategies to the characteristics of Arabic material. The teacher not only explains the theory but also chooses examples, exercises, and forms of repetition appropriate to the material's difficulty to help students understand. As obtained from interviews.

"*The teaching process carried out in explaining material such as qawaid and mufradat is taught with contextual examples and gradual exercises so that students can easily understand.*" (Teacher A)

"*The teacher's teaching strategy is adjusted to the character of the material, so that examples and repetition follow the delivery of theory*." (Teacher B)

"*Teachers often explain the material with simple examples, exercises, and repetition so that the lesson is easier to understand.*" (Student FGD)

5. Technological Content Knowledge (TCK)

The use of technology helps teachers present Arabic material in a more concrete and easy-to-understand way. The use of audio, visual, presentation, video, and digital materials supports the explanation of vocabulary, text, and language structure, enabling students to gain a clearer, more contextualized learning experience. As obtained from interviews.

"*The technology used by teachers to display slides, audio, and videos is used to clarify vocabulary, pronunciation, and comprehension of Arabic texts.*" (Teacher C)

"*The use of digital technology helps teachers in presenting material to be more concrete, especially in the explanation of language structure and examples of use.*" (Teacher A)

"*Teachers use technology to present materials to make them easier to understand in the form of PowerPoint slides, audio pronunciation, and learning support videos, such as those from YouTube.*" (Student FGD)

6. Technological Pedagogical Knowledge (TPK)

Madrasah emphasizes the importance of utilizing technology not only to display materials but also to organize learning activities. Teachers use it in task sharing, interaction management, activity direction, and learning evaluation, so that the learning process becomes more structured, flexible, and easy to control inside and outside the classroom. As obtained from interviews.

"*Technology engagement is used to share assignments, organize learning activities, and monitor student engagement regularly.*" *(Teacher A)*

"*In addition, digital media helps the management of learning to be more structured, flexible, and easily controlled in the classroom.*" (Teacher B)

"In the learning process, technology makes it easier to accept assignments, follow the teacher's directions, and know learning activities more regularly." (Student FGD)

As the researcher's observation strengthens this argument, Arabic language learning at MAN 2 Malang City takes place in a structured manner through effective mastery of materials, varied methods, and the use of technology such as projectors, presentations, and digital media. The interaction between teachers and students also shows the integration between content, pedagogy, and technology in learning practices. In addition, the document analysis shows that learning tools, teaching materials, and digital media support the implementation of targeted Arabic language learning. The madrasah document also shows a commitment to technology-based governance, providing a strong administrative and academic basis for the application of the TPACK framework in learning. The following researcher presents a summary of the findings obtained.

Table 2. Acquisition of Arabic Language Learning Findings TPACK Perspective

Aspects/Code	Findings	Reflection Analysis
CK	Teachers master *mufradat, qawaid, maharah*, and learning objectives in a structured manner.	Content mastery supports the delivery of material that is systematic and according to students' abilities.
PK	Teachers use explanations, questions and answers, exercises, discussions, and assignments.	Variety of methods shows pedagogic abilities that encourage student activity.
TK	Teachers utilize projectors, digital presentations, online media, and madrasah platforms.	Technological knowledge supports the delivery of learning materials and communication.
PCK	Teachers adapt teaching strategies to the character of the material through examples and gradual exercises.	Pedagogical and content suitability helps students understand the material more easily.
TCK	Technology is used to clarify vocabulary, text, pronunciation, and language structure.	Technology makes material more concrete, engaging, and easy to understand.
TPK	Technology is used for assignments, interactions, learning directions, and evaluations.	Technology supports more structured and flexible learning.

The researcher depicts the findings in the image below:

Figure 3. Implementation of the TPACK Framework in Arabic Language Learning

According to Mishra & Koehler (2006), TPACK is a model that describes the relationship between technology, pedagogy, and content for effective integration of technology into teaching. Strengthening content knowledge emphasizes that the quality of learning is highly determined by the depth of the teacher's mastery of the material taught. In language learning, content mastery includes understanding linguistic elements, language skills, learning objectives, and the appropriate order of material for students' level of development (McKnight, 2010). Research confirms that strong mastery of content enables teachers to structure learning effectively, maintain the accuracy of the material, and help students gradually and meaningfully understand language concepts (Jimola, 2025).

Pedagogical knowledge refers to teachers' ability to design, manage, and evaluate the learning process through approaches, methods, and strategies that align with students' characteristics. This approach requires teachers not only to convey information but also to create active, directed, and participatory learning interactions (Evans., 2014). The study by Muir et al. (2022) shows that a variety of pedagogical strategies can increase student engagement, strengthen understanding, and create a more dynamic learning experience than lectures alone.

The provision of technological understanding refers to teachers' ability to understand, select, and use relevant technology to support the learning process. In the context of modern education, technological knowledge not only includes mastery of digital devices but also an understanding of the role of media in facilitating communication, distributing materials, and managing learning activities (Orey, 2010). As Septiani Selly Susanti et al. (2024) et al research shows, mastery of technology by teachers plays an important role in improving learning efficiency, expanding access to learning resources, and supporting a more flexible and responsive learning process.

Pedagogical content emphasizes the teacher's ability to transform teaching material into a form that is easier to understand through pedagogical strategies that align with the lesson's content characteristics. In language learning, this ability is evident when the teacher adjusts methods, examples, exercises, and stages of

explanation to the material's difficulty (Horwitz, 2020). In the study by Garcia-Varela et al. (2025), integrating pedagogy and content helped students understand the material more concretely, reduce conceptual abstraction, and improve the overall learning process.

Technology content literacy explains the relationship between technology and material substance, namely, how technology is used to represent learning content in clearer, more concrete, and more accessible ways. In language learning, technology can support the presentation of vocabulary, structure, text, and pronunciation through audio, visual, and digital sources (Jodi Pilgrim, 2025). Research by Asrizal et al. (2023) shows that using technology in harmony with the material's character can improve understanding of the concept, strengthen students' grasp, and make the material more interesting.

Understanding how to use technology in teaching emphasizes the teacher's ability to support learning strategies, manage interactions, assign tasks, and evaluate student learning. Technology tools can strengthen pedagogical processes, enabling learning to be more planned, flexible, and controlled. In line with research, Cho et al. (2020) emphasized that integrating technology into pedagogical strategies can improve classroom management efficiency, accelerate feedback, and expand learning spaces inside and outside the classroom.

Understanding how to use technology in teaching emphasizes the teacher's ability to support learning strategies, manage interactions, assign tasks, and evaluate student learning. Technology tools can strengthen pedagogical processes, improving learning to be more planned, flexible, and controlled (Conrad, 2021). In line with Research, Cho et al. (2020) emphasized that integrating technology into pedagogical strategies can improve classroom management efficiency, accelerate feedback, and expand learning spaces inside and outside the classroom.

D. Conclusion

Overall, this study confirms that technology plays an important role in improving the quality of Arabic language learning through planning, material management, and evaluation. Technology helps teachers compile modules, formulate goals, set schedules, and strengthen coordination more systematically. In managing materials, technology facilitates the preparation, updating, and enrichment of teaching materials with various digital sources. In evaluation, technology accelerates assignment, assessment, progress recording, and feedback. These findings are strengthened by the use of LMS, Edu-Panda, and the Madrasah Digital Report Card, as well as by institutional support for the Digital Madrasah policy. However, this research still has limitations because it focuses on a single institution, so the findings cannot be generalized to all madrasah contexts. However, this research makes a theoretical contribution by emphasizing that integrating technology into Arabic language learning involves integrating curricular, pedagogical, technological, and institutional dimensions within the TPACK framework. In practice, the results of this study emphasize the need to strengthen teachers' digital competence, optimize learning platforms, and sustain institutional support for policy. Future research should develop comparative studies, examine the impact on learning outcomes, identify the obstacles educational institutions

face in implementing digital technology, and examine teachers' and students' readiness in greater depth.

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