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EXPLORING THE DEVELOPMENT OF TEACHERS' COMPETENCES IN TECHNOLOGY-BASED EMI PRACTICES IN AN INDONESIAN ISLAMIC SCHOOL

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Abstract

This study aims to describe how technology-enhanced learning with an English as a Medium of Instruction (EMI) approach is implemented at an Islamis school and to explore how teachers respond to the program. In Indonesian Islamic schools, EMI is seen as a strategic effort to strengthen students' global readiness; therefore, integrating EMI with technology supports modernization. Using a qualitative participatory design, the research involved around 50 teachers from various subjects and was carried out in three stages: training, classroom implementation, and reflection. Data were collected through observations, interviews, and documentation, then analyzed thematically using NVivo 14 with EMI, TPACK, and SWOT as analytical lenses. The findings show that technology-based EMI is progressing but still not fully effective; teachers use technology mainly for visual support and basic English exposure, but EMI practices remain limited because of frequent code-switching, technical problems, time constraints, and minimal use of interactive digital tools. Interviews reveal that teachers respond positively yet realistically: they appreciate the increased student engagement, modernized learning atmosphere, and growing professional confidence, but also acknowledge challenges such as low digital skills, limited English proficiency, and insufficient structured training. The SWOT mapping shows opportunities in institutional branding and global readiness, and threats in inadequate infrastructure, inconsistent policies, and low parental digital literacy. The study concludes that technology-based EMI in MTs Cijangkar has strong potential but is still in transition, requiring sustained professional development, better facilities, and consistent institutional support for EMI to become a stable and effective instructional practice.

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INTRODUCTION

Education in the 21st century is increasingly shaped by globalization, rapid technological development, and the rising importance of English as an international language. Madrassas in Indonesia, as part of the national education system, must adapt to these shifts to remain competitive. Integrating learning technology and adopting English as a Medium of

Instruction (EMI) is seen as a strategic move to strengthen the global competitiveness of madrasa graduates (Machmud, Widiyan, & Ramadhani, 2021; Sukmayadi & Yahya, 2020).

Despite this growing urgency, madrassas still lag behind public schools under Kemendikbudristek. Recent studies emphasize that technology is a key catalyst for modern learning, yet access and implementation in madrassas remain limited due to infrastructure and training gaps (Herdina & Ningrum, 2024; Suwarni & Natsir, 2024). At the same time, EMI—which ideally opens access to global knowledge—has not been widely adopted because many non-English subject teachers still lack sufficient English competence and pedagogical readiness (Suwartono, 2019; Rahmawati & Yusuf, 2024). These conditions contribute to a widening gap between madrasa teachers and public-school teachers, both in English proficiency and in digital literacy.

Research shows that technology-enhanced learning can improve teacher instruction and shape positive student perceptions (Son, 2018; Kumar, Shet, & Parwez, 2022; Fadillah et al., 2025). Studies by Doiz, et al (2020) further suggest that technology integration strengthens EMI by supporting clearer instruction and broader international collaboration. However, most existing studies focus primarily on public schools or higher education contexts, where teachers and institutional resources are often more supportive of EMI implementation (Macaro et al., 2018; Takahashi, 2024). As a result, there remains limited empirical evidence on how EMI practices can be developed through technology-based approaches in Indonesian madrasahs, particularly among non-English subject teachers. This study addresses this important gap by focusing on the unique pedagogical, linguistic, and institutional realities of Islamic schooling, which differ significantly from other educational institutions.

The situation at Madrasah Tsanawiyah (MTs) Cijangkar, Ciawi, Tasikmalaya, illustrates this gap clearly. As a private madrasa under the Cijangkar Islamiyah Foundation, it employs teachers—particularly in PAI, Science, and PKn—who generally lack experience with EMI. Early observations reveal that learning remains conventional, minimally technological, and lacks EMI exposure to support students' global readiness. This issue is intensified by limited training opportunities compared to those available to public-school teachers, both in English competence and digital literacy (Widyasari & Dardjito, 2022).

These limitations become clearer when viewed through micro, meso, and macro levels of learning. At the micro level, teachers' language and pedagogical readiness for technology-based EMI remains low. At the meso level, classroom interaction still relies heavily on Indonesian and conventional methods, inhibiting active engagement with digital media. At the macro level, madrasa development policies have not yet integrated EMI and technology as institutional priorities. Meanwhile, successful cases in modern Islamic boarding schools such as Gontor demonstrate how bilingual curricula supported by technology can significantly enhance educational outcomes (Aziz, 2019; Priyanto & Ghufron, 2019).

Based on these conditions, this research becomes essential for addressing both practical needs and academic gaps. It aims to identify strategies for implementing EMI-based technology in learning and to explore teachers' responses to these innovations in non-English subjects. Accordingly, this study is guided by two research questions: (1) How is technology-based EMI implemented in teaching practices at MTs Cijangkar Tasikmalaya? and (2) How do teachers respond to the integration of EMI and technology in non-English subject classrooms? More broadly, the research seeks to produce a model of teacher assistance that supports effective EMI-technology integration. Its theoretical contributions enrich the limited literature on technology and EMI in madrassas, while its practical benefits offer applicable models for teachers, insight for madrassas in curriculum and policy development, and input for government training programs.

RESEARCH METHOD

Research Design

This study uses a qualitative approach with a participatory study design. This approach was chosen because it is in accordance with the purpose of the research, which is to understand in depth the process of assisting madrasah teachers in integrating learning technology with the English as a Medium of Instruction (EMI) approach. In line with Creswell's (2018) view, a qualitative approach allows researchers to explore the meaning, perception, and experience of research subjects in their natural context.

This methodology is deemed the most suitable for addressing the research questions of this study, as it enables the researcher to analyze the implementation of technology-based EMI in actual classroom practices and to comprehend instructors' responses, reflections, and obstacles throughout the process. The study emphasizes investigating experiences and instructional development instead of objectively assessing outcomes; thus, a qualitative participatory method offers the necessary depth and contextual knowledge.

Participatory design is applied because this research not only observes, but also involves teachers as active participants in the training process and the application of technology-based learning. Teachers are not positioned as objects of research, but rather as partners who participate in designing, trying, and reflecting on EMI practices in their classrooms. This collaborative structure directly influences both the research process and its outcomes. Thus, the study documents genuine transformations in teaching methods, professional confidence, and instructional strategies by including teachers in ongoing engagement. This approach aligns with participatory and action-oriented research, highlighting teacher engagement as a crucial factor in fostering sustained instructional innovation (Wyatt & Dikilitaş, 2019).

The research process consists of three primary stages: (1) preparation and training in technology utilization within the framework of EMI, (2) execution of technology-enhanced learning in individual classrooms, and (3) evaluation of implementation outcomes via group discussions and comprehensive interviews. These steps are regarded not as distinct procedures but as a cyclical and interconnected process. This design embodies the tenets of action research, wherein professional development evolves through repetitive cycles of practice, observation, and reflection (Burns, 2019). The reflection step is crucial, as reflective practice allows educators to critically assess their experiences, recognize obstacles, and enhance their EMI techniques progressively (Farrell, 2019). This organized yet adaptable design enhances the credibility of the research process and the practical significance of its results through a participative approach.

Research Participants or Population and Sample

This research was conducted at MTs Cijangkar Tasikmalaya, a private madrasah under the Cijangkar Islamiyah Foundation, selected purposively because it represents typical madrasa conditions that still struggle with technology use and English as a medium of instruction. The site was also chosen because it had twice been the location of PKM activities for the S2 TBI Program at UIN Sunan Gunung Djati Bandung, allowing the researcher to already understand the teachers, school culture, and learning needs. The study took place over three months (June–August 2025), covering preparation, training, implementation, and reflection, giving teachers time to apply the mentoring in their classrooms.

Around 50 teachers from various subjects—especially PAI, Science, and PKn—participated, with teaching experience ranging from 5 to 20 years and an average age of about 30, representing a mix of young and experienced teachers. Most participants had limited prior exposure to EMI, as English was rarely used as a medium of instruction in their daily teaching practices. In addition, teachers' technological experience varied considerably: while some younger teachers were familiar with basic digital tools such as PowerPoint and mobile

applications, many others demonstrated low levels of digital literacy before the intervention, particularly in using interactive platforms or troubleshooting technical problems. This diversity in prior experience influenced how teachers engaged with the training sessions, as those with minimal digital and English competence faced greater challenges in adapting EMI strategies during classroom implementation. Participants were selected through purposive sampling based on criteria such as being active teachers, willingness to join all activities, possession of basic digital devices, and motivation to improve English proficiency and digital literacy. All participants signed informed consent, and the involvement of 50 teachers provides a representative picture of teachers' readiness, perceptions, and challenges in integrating technology and EMI in madrasas.

Instruments

This study's data was gathered using several complementary techniques to offer an in-depth view of the implementation of technology-based learning with EMI approach at MTs Cijangkar. The initial method involved comprehensive interviews with teachers participating in the mentorship program. The interviews examined their experiences, perceptions, and reflections regarding the utilization of technology in EMI-based learning. The researcher sought to comprehend the teacher's views regarding the advantages, obstacles, and modifications encountered in their daily instructional practices.

To augment the reliability of the interview data, the researchers employed guiding questions congruent with the research objectives and maintained consistency among participants, facilitating valid comparison of emergent themes. The interviews were conducted in a semi-structured format, enabling the researcher to adhere to a predetermined question set while also permitting flexibility for probing and follow-up queries to investigate participants' responses more thoroughly. Moreover, member checking was performed by disseminating essential interpretations to multiple participants to validate the findings and mitigate misrepresentation of teachers' viewpoints.

The study employed classroom observation and documentation alongside interviews. Observations were conducted to directly assess teachers' interactions with students, the implementation of instructional methodologies, and the utilization of English and digital tools throughout lessons, offering insight into the actual extent of technology integration. A systematic observational approach was employed utilizing a guideline that emphasized critical elements such teacher-student contact, instructional delivery, language utilization during EMI activities, and the incorporation of digital platforms and learning resources. Field notes were meticulously documented during each session to capture educational approaches and classroom dynamics.

Documentation—including video recordings, student work, and digital teaching materials generated during mentoring—provided corroborative evidence that enhanced the findings from interviews and observations, while also facilitating the assessment of technology utilization and English proficiency in meeting educational objectives. The credibility of the findings was enhanced via data triangulation, where information from interviews, observations, and documentation was cross-verified to ensure consistency and mitigate any bias. This triangulated methodology guaranteed that the interpretations were based on various sources of evidence instead of depending on a singular instrument. Additionally, peer debriefing with colleagues or supervisors was utilized to evaluate the coding process and improve analytical dependability.

All qualitative data were subjected to thematic analysis utilizing NVivo 14. The software was utilized to systematize, encode, and classify interview transcripts, observation notes, and documentation records into significant themes. Patterns concerning EMI practices, technological integration, and instructors' responses were discerned and analyzed through an iterative coding approach. NVivo facilitated the methodical mapping of themes utilizing

EMI, TPACK, and SWOT frameworks, enhancing the dependability and transparency of the analytical process.

Table 1
Data Collection Techniques

Data collection techniques	Purpose of data collection	Research Questions (RQ)
Interview	Exploring teachers' experiences, perceptions, and reflections related to the application of EMI-based technology in learning.	RQ 2
Classroom observation	Observe firsthand learning practices, teacher-student interaction, and the use of English and technology in the classroom.	RQ 1
Documentation	Collect physical evidence such as learning videos, student assignments, and digital teaching materials created by teachers.	RQ 1 & RQ 2

This research has three main phases: preparation, assistance implementation, and reflection and assessment. During the preparatory phase, the researcher collaborates with the madrasah administrator and the involved educators to elucidate the aims and strategies of the research activities. An initial evaluation is performed to ascertain the teachers' levels of digital literacy and fundamental English proficiency. The outcomes of this evaluation provide the basis for developing suitable training resources and mentoring approaches customized to the participants' requirements.

The second phase entails the execution of support, when teachers engage in training and mentoring activities centered on EMI-based learning technologies. Mentoring is provided through interactive workshops and practical sessions that encompass the development of digital teaching materials in English, the utilization of applications such as Google Classroom, Canva for Education, and Padlet, as well as simulations of teaching academic subjects (Science, PAI, and PKn) employing simplified English. Subsequently, each teacher implements the training outcomes inside their individual classrooms, supervised by researchers and facilitators. The last step involves reflection and evaluation, during which teachers participate in interviews and focused group discussions (FGDs) to contemplate their experiences. This phase aims to evaluate the efficacy of technology integration and the appropriateness of the applied EMI techniques. The reflection process is examined through a SWOT (Strengths, Weaknesses, Opportunities, Threats) framework to discern both facilitating and obstructive elements affecting program execution.

Data Analysis

The qualitative data gathered from interviews, classroom observations, and documentation were processed by theme analysis utilizing NVivo 14. All transcripts, field notes, and documentation records were transcribed and entered into the software for systematic organizing and analysis. The coding approach occurred in multiple phases, commencing with open coding to discern significant portions pertaining to EMI practices, technological integration, and educators' experiences. The original codes were further organized by axial coding by analyzing links and repeating patterns among participants, facilitating the emergence of bigger groups. Ultimately, selective coding was utilized to enhance primary themes and correlate them with the foundational frameworks of EMI, TPACK, and SWOT, so maintaining a theoretically sound and cohesive study.

NVivo 14 enhanced this process by providing organized code management, display of thematic structures, and reliable retrieval of coded evidence from various data sources. To enhance the linkage between analysis and research objectives, each theme was distinctly aligned with the research questions: themes centered on classroom implementation of English

and digital tools primarily pertained to RQ1, whereas themes emphasizing teachers' perceptions, benefits, and challenges were associated with RQ2. The study presents the important findings initially, followed by an explanation of how these results address each research topic, substantiated with pertinent excerpts from interviews and observations. Furthermore, summary tables are employed to consolidate key themes and illustrate trends within the data, so improving clarity, transparency, and the general credibility of the study.

RESEARCH FINDINGS AND DISCUSSION

Research Findings

The Implementation of the use of EMI-based learning technology at MTs Cijangkar Tasikmalaya

The study presents the results of research and discussion on the implementation of technology-based learning with the English as a Medium of Instruction (EMI) approach at MTs Cijangkar Tasikmalaya. The data obtained through classroom observation and interviews with teachers were presented to answer the formulation of the research problem, then interpreted by referring to the theoretical framework discussed in Literature review. Thus, this section becomes the link between theoretical foundations and empirical findings in the field.

Learning and Content Mastery Practices

Observations of ten teachers (G1–G10) reveal that the integration of technology in learning and content mastery was evident yet inconsistent, varying from "Quite Consistent" to "Invisible/Not Done." Teachers effectively utilized technology for content visualization and scaffolding; nevertheless, the efficacy of active learning and time management was frequently hindered by inadequate infrastructure and technical disturbances.

Table 2 indicates that the majority of indicators attained a "Quite Consistent" level, especially in achieving learning objectives, relating subject matter to broader contexts, and utilizing scaffolding tactics. Nevertheless, efficiency and time management surfaced as the most deficient aspect, indicating delays attributable to equipment constraints, application malfunctions, and unreliable connectivity. The findings indicate significant advancement in technology-enhanced instruction; nonetheless, consistent adherence to TPACK principles is constrained by inconsistent utilization of interactive tools and infrastructural obstacles.

Table 2
Observation of Learning Practices

No.	Observation Indicators	Average Total Score	Category
A1	Delivery of learning objectives	2.3	Quite Consistent
A2	Connections to global contexts/contemporary issues	2.3	Quite Consistent
A3	Use of active learning methods	2.3	Quite Consistent
A4	Efficiency and time management	1.8	Invisible/Not done
A5	Scaffolding (gradual relief)	2.4	Quite Consistent

Use of English as a Medium of Instruction (EMI)

Classroom observations across five EMI indicators (Section B) indicate that the overall implementation of English as a Medium of Instruction among the ten observed teachers was at a "Quite Consistent" level, with average scores between 2.2 and 2.45, as detailed in Table 3. Teachers often exhibited awareness and desire to utilize English in classroom instruction, especially in everyday expressions and subject-specific vocabulary. Nonetheless, consistency sometimes diminished throughout prolonged educational engagement, often attributable to apprehensions regarding students' comprehension, leading to frequent and unanticipated code-switching to Indonesian.

Table 3 indicates that the most robust elements of EMI implementation were the utilization of subject-specific terminology (B2) and the usage of English in initiating and concluding learning sessions (B3), both attaining the highest average scores. Conversely, the provision of primary instructional directions (B1) yielded the lowest average score, signifying difficulties in sustaining English for ongoing operational instruction. Moderate scores in code-switching control (B4) and oral clarification (B5) indicate that teachers employed language transitions strategically, however code-switching frequently occurred as an immediate reaction rather than a deliberate instructional approach. The data suggest that EMI techniques were more effective when augmented by visual aids and technological resources; nonetheless, the continuous and consistent use of English during the class necessitates additional support and structured direction.

Table 3
Use of English

No.	Observation Indicators	Average Total Score	Category
B1	Main Instructions (Open the book, do the task)	2.2	Quite Consistent
B2	Subject Specific Terminology	2.45	Quite Consistent
B3	Opening and Closing Learning Sessions	2.45	Quite Consistent
B4	Control Code-Switching	2.3	Quite Consistent
B5	English Oral Clarification	2.3	Quite Consistent

Utilization of Learning Technology

Classroom observations reveal that the application of learning technology, an essential element of the TPACK framework, was typically evident but exhibited varying degrees of efficacy among teachers. Table 4 indicates that technology was predominantly utilized as a visual aid (C1), assisting educators in elucidating abstract concepts via presentations, movies, and simulations. Educators exhibited a notable congruence between chosen tools and subject matter (C3), signifying an adequate Technology–Content Fit in the majority of lessons.

The incorporation of interactive apps and technology-based assessments (C2) persisted at a "Quite Consistent" level, indicating that technology was predominantly employed for teacher-centered instruction rather than for collaborative or student-driven learning. The most inadequate signal was the handling of technological restrictions (C4), highlighting ongoing issues such as restricted devices, inconsistent internet connectivity, and inadequate troubleshooting assistance. Student engagement with technology (C5) remained constrained, with learners frequently acting as passive recipients rather than active users of digital resources. The findings indicate that technology efficiently facilitates visualization; yet, it necessitates enhanced infrastructure and technical ability to provide more participatory, student-centered integration.

Table 4
Utilization of Learning Technology

No.	Observation Indicators	Average Total Score	Category
C1	The use of technology as an effective visual aid	2.8	Consistent/Very Consistent
C2	Integration of interactive applications/technology-based assessments	2.3	Quite Consistent
C3	Technological suitability with pedagogical content and objectives (Technology-Content Fit)	2.6	Consistent
C4	Management of technical constraints	1.5	Invisible/Not Done
C5	Facilitation of students to use technology in the learning process	2.2	Quite Consistent

Teacher-Student Interaction and Engagement

Classroom interaction observations (Indicator D) indicate that overall involvement was at a "Quite Consistent" level, with discrepancies across specific indicators (refer to Table 5). Student enthusiasm (D1) and responsiveness to teachers' English instructions (D2) exhibited modest consistency, especially at the commencement of classes utilizing visual aids. The most significant part was the delivery of constructive and prompt feedback (D3), demonstrating that educators regularly facilitated students' learning through corrective and affirmative responses. However, balanced two-way interaction (D4) remained moderate, indicating teacher-centered classroom communication. Student active use of English in interaction (D5) was the poorest indication, suggesting low constructive language use during discussions or peer exchanges. Initial engagement and teacher evaluation were good, but sustained interactive communication and student-generated English use need improvement.

Table 5
Teacher-Student Interaction (*Engagement*)

No.	Observation Indicators	Average	Category
D1	Active engagement and student enthusiasm	2.4	Quite Consistent
D2	Student response to the teacher's instructions/questions in B. English	2.3	Quite Consistent
D3	Providing constructive and timely feedback	2.7	Consistent
D4	Balanced two-way interaction (not teacher dominance)	2	Quite Consistent
D5	Use of B. English by students in interacting	1.8	Invisible/Not Done

Madrasah teachers' responses to the implementation of technology-based learning with the EMI approach

This section answers the second study question about madrasah instructors' attitudes to technology-based learning utilizing English as a Medium of Instruction (EMI). Qualitative interview data on teachers' strengths, weaknesses, opportunities, and threats was evaluated. These categories reflect instructors' views, experiences, and comments on technology and English integrated classroom instruction. The SWOT analysis shows teachers' readiness and challenges in embracing EMI-based technology improvements.

Strengths

The interview analysis identified six primary strengths of the EMI–technology program, as summarized in Table 6, with 35 coded references from 10 teachers reflecting strong positive perceptions. The most frequently highlighted strengths included the modernization and visualization of subject matter, the use of digital media and applications, and the implementation of simple English instruction in classroom practice. Teachers also reported increased confidence and professionalism, along with improved student engagement during lessons. Overall, these findings suggest that the integration of English and technology enhanced instructional effectiveness, fostered a more interactive learning environment, and contributed positively to the madrasa's institutional image.

Table 6
Strengths of EMI Programs and Technology

No	Strengths	Teachers	Frequency
1	Integration of English and technology in the learning process	4	4
2	Classes are more interactive and engaging for students	3	3
3	Modernization and visualization of subject matter	5	5
4	Utilization of digital media and applications in learning	5	5
5	Use of simple English instruction in the classroom	5	5
6	Increased teacher confidence and professionalism	3	3
	Total	10	35

Weaknesses

The study of the interview disclosed multiple significant deficiencies encountered by madrasah teachers in the execution of technology-enhanced learning utilizing the EMI methodology, as outlined in Table 7. Forty-one coded references demonstrate that these limitations are pervasive and systemic rather than isolated. The predominant difficulty noted was inadequate digital learning resources and technical assistance, cited by 9 teachers with 12 references. Teachers also emphasized limitations in their digital literacy and technological competencies, which were noted 10 times among 9 participants, indicating that many still lack confidence in utilizing applications, managing online platforms, and seamlessly integrating English into technology-enhanced instruction.

Table 7
Weaknesses of EMI Programs and Technologies

Yes	Weaknesses	Teachers	Frequency
1	Limited digital learning facilities and technical support	9	12
2	Limitations of teachers' literacy and technology skills	9	10
3	Limited time and workload in preparing digital materials	3	3
4	Lack of continuous advanced training	6	6
	Total	10	41

Furthermore, teachers indicated inadequate ongoing training and constrained time for the preparation of digital resources owing to substantial workloads. While time constraints were less prevalent, they were characterized as a considerable burden when coupled with administrative tasks and teaching obligations. The findings indicate that the primary deficiencies of technology-based EMI arise from interrelated structural factors, such as insufficient infrastructure, inconsistent teacher proficiency with digital tools, and a lack of ongoing professional development, which collectively impede consistent implementation in daily practice.

Opportunities

The interview results indicated substantial prospects linked to the EMI-technology initiative, as detailed in Table 8, with 31 coded references from all 10 teachers. These chances arose at two interrelated levels: the institutional (madrasah) level and the student level. At the madrasah level, teachers perceived technology-based English Medium Instruction (EMI) as a strategic avenue to enhance the branding of the madrasa as a contemporary and globally oriented school. The predominant prospects identified were enhancing teacher competence as a long-term investment and preparing the madrasa for international expansion, while fewer mentions indicated the potential for partnerships and external support from universities or other stakeholders.

Table 8
EMI and Technology Program Opportunities

No	Opportunities		
A	Level madrasah	10	11
1	Branding of modern madrassas and go international	5	5
2	Strengthening teacher competence as a long-term investment	5	5
3	External partnership and support opportunities	1	1
B	Student level	10	10
1	Strengthening digital literacy and learning independence	4	4
2	Increase interest and motivation to learn English	3	3
3	Exposure to global terms and readiness of international scholarship-networks	3	3
	Total	10	31

Teachers highlighted that technology-supported English Medium Instruction (EMI) might improve digital literacy and promote more learning autonomy among students. They observed that exposure to English via digital media enhanced the interest of learners and interest in language acquisition, while familiarizing them with global terminology that could facilitate future academic mobility, scholarships, and international networking. The findings indicate that teachers view EMI as both an educational method and a long-term investment that enhances institutional growth and students' preparedness for an international context.

Threats

Despite the EMI-technology program exhibiting promising potential, the data indicate multiple systemic concerns that could impede its long-term viability, as outlined in Table 9. A total of 34 coded references from 10 teachers demonstrate that external and structural factors significantly impact implementation. The primary threat is the restricted access to technology facilities and infrastructure, cited 13 times by 8 teachers, encompassing inadequate gadgets such projectors and PCs, unstable internet connectivity, and poor classroom preparedness. Additional persistent dangers encompass inadequate continuous teacher training, insufficient institutional policy backing, low parental digital literacy, and the lack of a specialized technical support system. These findings indicate that issues transcend individual teacher capability and are embedded in wider institutional and environmental limitations.

Despite recognizing these barriers, teachers generally maintain a positive outlook toward EMI, viewing it as a progressive step for improving instructional quality and institutional development. However, their optimism is tempered by concerns about technological readiness and inconsistent systemic support. Overall, the data indicate that the sustainability of technology-based EMI depends not only on teacher commitment but also on strengthened infrastructure, continuous professional development, and more structured institutional backing.

Table 9
Themes Related to Threats in EMI and Technology Programs

No	Threats		
1	Limited madrasah technology facilities and infrastructure	8	13
a	Supporting equipment facilities	8	8
b	Infrastructure	5	5
2	Limited ongoing teacher training and upgrading programs	4	4
3	Policy limitations and institutional support	3	3
4	Lack of support and digital literacy of parents	2	2
5	Lack of technical support system in madrassas	1	1
	Total	10	34

Discussions

This study examines the implementation of EMI-based learning technology at MTs Cijangkar Tasikmalaya and explores teachers' perceptions of its integration in classroom practice. By synthesizing findings from both classroom observations and teacher interviews, the discussion situates the results within broader EMI scholarship while identifying pedagogical, linguistic, and systemic implications. The findings indicate that EMI implementation at MTs Cijangkar is in a transitional stage: although teachers have begun integrating English and digital technology in meaningful ways, the depth and consistency of implementation remain constrained by limited linguistic proficiency, uneven digital competence, and insufficient institutional support.

Classroom observations demonstrate a gradual shift from monolingual instruction toward multilingual and multimodal practices. Teachers incorporate English terminology

alongside digital materials such as slides, images, and short videos to support content delivery. Within EMI scholarship, such multimodal strategies are widely interpreted as scaffolding mechanisms that enable learners to access disciplinary knowledge despite limited English proficiency (Macaro, 2018; Doiz, Lasagabaster, & Sierra, 2020). In this regard, the integration of visual and technological resources at MTs Cijangkar reflects an emerging awareness of the need to mediate both language and content simultaneously. Rather than representing superficial modernization, these practices signal an evolving pedagogical orientation that acknowledges the cognitive demands of learning subject matter through a second language.

However, the data also reveal that English use remains strategically limited. Teachers tend to employ English in predictable and structured components of lessons, such as greetings and key terminology, but frequently revert to Indonesian when conceptual explanations become cognitively demanding. This pattern illustrates a fundamental tension in EMI contexts: while institutional aspirations often prioritize increased English exposure, classroom realities necessitate flexibility to safeguard comprehension. Contemporary EMI research increasingly reframes code-switching and translanguaging not as pedagogical failure but as adaptive strategies that ensure equitable access to content (Lin & He, 2017; Macaro, 2018). From this perspective, the linguistic practices observed at MTs Cijangkar should be understood as contextually responsive rather than deficient. Nevertheless, the reliance on teacher-directed explanation suggests that language integration has not yet matured into dialogic or interaction-rich forms of EMI.

A similar pattern emerges in relation to technological integration. Although digital tools are consistently used to visualize and structure content, their function remains predominantly presentational. Teachers employ technology to transmit information more clearly, yet opportunities for students to use digital platforms collaboratively or productively are limited. This finding is significant because recent EMI research emphasizes that technology can serve as a catalyst for interaction, critical inquiry, and learner autonomy when embedded within student-centered pedagogies (Zhang & Pladevall-Ballester, 2022; Kang & Choi, 2021). The predominantly receptive participation observed at MTs Cijangkar suggests that technology has not yet been leveraged to support meaningful language production or knowledge co-construction. Consequently, EMI implementation appears to operate at a functional rather than transformative level.

The challenges reported by teachers further illuminate the structural dimensions of this transitional phase. Difficulties in managing devices, resolving technical issues, and preparing digital materials indicate incomplete integration of technological, pedagogical, and content knowledge as conceptualized in the TPACK framework (Mishra & Koehler, 2006). Without sustained professional development and institutional scaffolding, technology risks remaining an add-on rather than becoming embedded in pedagogical design (Scherer et al., 2019). Importantly, these challenges are not merely technical; they intersect with linguistic limitations, workload pressures, and resource availability. Thus, EMI development cannot be reduced to teacher motivation alone but must be understood as a systemic undertaking requiring coordinated policy, infrastructure, and long-term capacity building.

Interview findings reinforce this interpretation by revealing both optimism and critical awareness among teachers. Participants perceive EMI-based technology as enhancing instructional quality, strengthening student competitiveness, and elevating the institutional image of the madrasah. These views resonate with global narratives positioning EMI as a mechanism for internationalization and institutional prestige (Dearden, 2015; Kirkpatrick, 2017). In the madrasah context, such aspirations carry additional significance, as schools navigate the dual imperative of maintaining religious identity while engaging with global

educational trends. EMI and technology are therefore framed not only as pedagogical tools but as strategic instruments of modernization and competitiveness.

At the same time, teachers openly acknowledge significant constraints, including limited English proficiency among students, uneven digital literacy, heavy preparation demands, and fragile infrastructural or policy continuity. These concerns mirror wider EMI challenges across Asia, where teacher readiness and language competence consistently emerge as key barriers to sustainable implementation (Macaro, 2018; Rose et al., 2021). Crucially, the findings suggest that resistance is not ideological but structural. Teachers demonstrate willingness and positive orientation toward EMI, yet implementation is hindered by systemic conditions that exceed individual agency. This underscores a central implication: EMI reform must be conceptualized as institutional transformation rather than isolated classroom experimentation.

Beyond the local context, the findings raise broader questions of equity and access. EMI initiatives may inadvertently privilege students with stronger pre-existing English proficiency and higher digital literacy while disadvantaging those without such capital. As Rose et al. (2021) argue, EMI can reproduce inequalities if language support structures are insufficiently institutionalized. The experience of MTs Cijangkar highlights the necessity of embedding explicit linguistic scaffolding and differentiated digital support within EMI programs to prevent stratification.

Moreover, the study reveals that digital competence is becoming inseparable from linguistic competence in contemporary EMI environments. The dual demands of operating in English and navigating digital platforms redefine what it means to be "EMI-ready." Professional development frameworks must therefore move beyond language training alone and incorporate sustained digital pedagogical mentoring. Without such integrated preparation, teachers may struggle to convert technological availability into pedagogical innovation.

The findings also emphasize the importance of shifting from exposure to engagement. While students encounter English terminology and multimedia input, opportunities for extended discourse, collaborative inquiry, and language production remain limited. Research consistently demonstrates that active language use through interaction and project-based learning strengthens both disciplinary understanding and linguistic development (Lin & He, 2017; Macaro, 2018). If EMI at MTs Cijangkar is to progress beyond symbolic implementation, greater emphasis must be placed on dialogic instruction and student-centered digital tasks that foster meaningful participation.

Future research should extend this inquiry by examining the longitudinal academic and linguistic impacts of EMI within madrasah contexts. Long-term studies are needed to determine whether sustained EMI exposure translates into measurable gains in English proficiency, subject mastery, and higher-order thinking skills. Additionally, experimental or design-based research could investigate the effectiveness of specific digital interventions—such as LMS-mediated collaboration or structured translanguaging protocols—in enhancing engagement and learning outcomes. Comparative studies of professional development models would also clarify which forms of training most effectively strengthen teachers' TPACK integration and EMI readiness. Finally, incorporating student voice into future investigations would provide deeper insight into how EMI shapes learner identity, motivation, and perceived academic agency.

In conclusion, EMI-based technology implementation at MTs Cijangkar represents a meaningful yet incomplete transition toward multilingual and digitally enhanced education. Teachers demonstrate conceptual alignment with scaffolding, translanguaging, and TPACK-informed principles, yet persistent linguistic, technological, and structural constraints limit transformative impact. By situating these findings within broader EMI debates, this study

illustrates how global educational reforms are locally negotiated within a madrasah setting characterized by aspiration and constraint. For EMI to evolve from symbolic modernization into sustainable and equitable pedagogy, institutional commitment, continuous professional development, and research-informed innovation must converge in a coordinated and long-term strategy.

CONCLUSION

This study examined the implementation of technology-based learning through an EMI approach at MTs Cijangkar Tasikmalaya and assessed teachers' responses to its integration into classroom practice. The findings indicate that despite the increasing utilization of digital technologies, individuals are not employing them in sophisticated manners, nor are they frequently using English. The efficacy of EMI in fostering active student engagement and substantial language growth is constrained by issues such as time management difficulties, technological challenges, and the predominant use of technology for presentations rather than interactive purposes. Educators are increasingly using more adaptable EMI techniques facilitated by technology. The incomplete mastery of TPACK among instructors indicates that pedagogical integration has not attained a transformative level and requires enhancement through continuous mentoring and institutional support.

The interview results indicate that teachers generally hold a favorable view of the program, associating it with contemporary teaching methodologies, enhanced professionalism, and increased competitiveness among educational institutions. They acknowledge that they continue to encounter challenges, including inadequate English proficiency, limited technological skills, the necessity for extensive preparation, and lack of access to advanced, continuous training. Educators also recognize external factors that may hinder the program's long-term sustainability, such as insufficient resources, noncompliance with policies, and inadequate parental support.

Technology-based English Medium Instruction at MTs Cijangkar demonstrates significant potential, albeit it remains in a transitional phase. This study provides several pragmatic ideas to improve its effectiveness in madrasah contexts. Initially, educational institutions ought to provide continuous professional development that instructs teachers on enhancing their English proficiency and devising engaging, student-centered digital EMI activities. Secondly, we require institutional mentorship frameworks and collaborative teacher communities that enhance TPACK integration and facilitate independent teacher preparation. Third, enhanced infrastructure and consistent policy support are essential to ensure the equitable and sustainable implementation of technology-based EMI. By concentrating on these domains, madrasahs can transcend mere symbolic adoption and advance towards EMI practices that are more pertinent, engaging, and effective, thereby better equipping students for learning in global and digital settings.

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INFORMED CONSENT STATEMENT

Participation in this study was entirely voluntary. All participants were informed about the purpose, procedures, potential risks, and benefits of the research before taking part. They were assured that their identities would remain confidential and that the information provided would be used only for research purposes. Participants also had the right to withdraw at any time without penalty.

DATA AVAILABILITY STATEMENT

The data supporting this study are not publicly available due to privacy considerations and ethical obligations to protect participant confidentiality. However, the dataset may be made available upon reasonable request for validation or further analysis. Any request for access must receive prior approval from the appropriate institutional ethics review board to ensure compliance with ethical standards.

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