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Understanding English Teachers' Engagement in Professional Learning Communities for TPACK Reconstruction

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Abstract:

This study examines the role of English teachers in Professional Learning Communities (PLCs) as they develop their Technological Pedagogical Content Knowledge (TPACK) within the context of cultural and religious norms in madrasahs in Semarang City, Indonesia. Using a qualitative ethnographic case study methodology, the data were collected through observations, questionnaires, and field notes to demonstrate teachers' behavioural, emotional, and cognitive engagement. The study consisted of 50 in-service English teachers from thirty Islamic junior high schools serving varying educational backgrounds and professional learning experiences. The findings suggest, using Fredricks et al.'s multidimensional framework on engagement, that the teachers were very engaged behaviourally when we measured their attendance, participation, and attempts to use technology in their classrooms. Emotionally, the teachers exhibited excitement, curiosity, key details, engagement, pride, and self-efficacy, which led them to feel connected to the PLC and motivated to experiment with different instructional practices. Cognitively, the teachers engaged in reflective practices, planning with goals, problem-solving, and pedagogically integrating technology with content. This study highlights that PLCs can be a formidable vehicle for collaborative professional growth, helping English teachers develop their technological teaching capacity and pedagogically innovate while maintaining their cultural and religious nuance. This study also highlights that TPACK reconstruction involves a process of continually engaging in multidimensional, ongoing interactions to be effectively reconstructed in a relevant context.

Keywords: Professional Learning Community, Teacher engagement, TPACK

1. INTRODUCTION

Professional Learning Communities (PLCs) have gained traction as an essential avenue for elevating teacher professional development, highlighting a commitment to collective inquiry, shared responsibility, and ongoing learning at the school level (Vescio et al., 2008). While

teaching is often seen as an isolated activity, PLCs promote collectively creating knowledge, sharing professional expertise, and collaborating to make ongoing and lasting improvement in instructional practices (Tam, 2015). These collaborative enterprises are becoming increasingly important in supporting purposeful teacher learning, capacity building, and innovation resilience in practice.

While useful literature has considered external and contextual enablers in developing PLCs, including leadership, organizational culture, or structural arrangements (Tam, 2015), results remain mixed. Huijboom et al. (2021) suggested that an individual factor—either leadership, time on task, or institutional support—could not explain the growth of PLC characteristics. Geletu & Mihiretie (2023) cautioned that communities of practice alone may not be sufficient to reinforce professional capacity or provide teachers with the necessary resources for effective curriculum enactment. Together, these mixed findings indicate a significant internal factor - the teachers' own engagement - exists and is disregarded, potentially impacting the sustainability and depth of PLC practice (Ning et al., 2016).

Teacher engagement is more than a visit; it is the teacher's emotional, motivational, and professional commitment to their work (Kozikoğlu & Senemoğlu, 2018). Engagement entails a commitment to the student(s) participating in ongoing professional learning and an effort towards educational innovation. The literature shows positive correlations between teacher engagement, teacher efficacy, professional engagement, job satisfaction, and commitment to the school (Høigaard et al., 2012). There has been little consideration of teacher engagement regarding PLCs relative to teachers' transformative learning and renewing professional learning. Furthermore, the extent to which teacher engagement may illuminate how PLCs provoke and mediate pedagogical change is worthy of further examination.

Regarding recent trends in teacher professional learning, specifically technology integration in pedagogy, Mishra and Koehler's model explains the need for teachers to manage technology, pedagogy, and content within the context (Chen et al., 2022). The TPACK framework can help promote teaching and learning from any form of teacher assessment. Teachers can learn how to select, modify, and effectively apply digital tools, thereby motivating their students to improve their learning outcomes (Boonsue, 2021).

Professional Learning Communities (PLCs) provide an excellent context for supporting teacher reconstruction and improvement of TPACK. Teachers can collaborate, participate in dialogue, and collectively engage in experimentation to address technology integration challenges, share experiences and practices, and develop confidence and competence with their digital pedagogy (Guo et al., 2025; Liu et al., 2024). This idea resonates with the examination of how general educational reforms have sought to support teachers' development of digital competency (Ratnayake, 2020) worldwide. Although technology integration is increasingly essential, contexts like Iran continue to present restricted and limited opportunities for novice and experienced EFL teachers to purposely draw attention to developing TPACK (Nazari et al., 2020).

In the Indonesian context, particularly within madrasah tsanawiyah (Islamic junior high schools), the issue becomes even more critical. Teachers in these settings face challenges such as unequal access to technology, varying digital literacy, and the need to harmonize modern pedagogical practices with local cultural and religious values (Hasan, 2021; Fadhliyah et al., 2020). Yet, little is known about how PLCs can provide a culturally responsive environment for teachers to negotiate these tensions while building their technological pedagogical expertise. Current

literature does not sufficiently address how teachers' multidimensional engagement within PLCs mediates the reconstruction of TPACK in religiously and culturally nuanced contexts.

Therefore, this study fills an important gap by investigating English teachers' engagement in PLCs for TPACK reconstruction in Indonesian madrasahs. It contributes by (1) foregrounding teacher engagement as a central variable in sustaining PLC practices, (2) situating TPACK development within collaborative, practice-based communities rather than isolated training, and (3) highlighting the unique interplay between cultural-religious values and digital pedagogy in the Indonesian Islamic school context.

2. LITERATURE REVIEW

2.1 Professional Learning Community

Professional Learning Communities (PLCs) are generally considered successful when they facilitate professional development, enhance staff morale, improve teaching practices, and enhance student achievement (Elhambakhsh et al., 2024). At minimum, Zhang (2022) identified five key elements for PLCs to function appropriately: shared norms and values; a focus on student learning; analysis of practice; collaborative work; and a commitment to reflective dialogue. Generally, effective PLCs work best as professional learning environments where teachers engage autonomously, while being guided and supported by school principals (Alamri,2023).

Members of PLCs are expected to actively and intentionally engage in their learning by engaging in reflective discussions and sharing experiences (Nazari et al., 2020). PLCs are potentially very useful for professional development and school improvement, and many are designed to support and meet both goals simultaneously (Geng & Liu, 2024). Research has shown that some degree of professional development has a positive impact on teachers' self-efficacy, making them more confident in their teaching practices, classroom management, and student engagement (Chen et al., 2022).

PLCs can transform the construction of teacher professional learning by enabling teachers to develop educational actions and foster educational growth through technology, within aligned community structures (Bin-Hady et al., 2024). PLCs support the development of transformative learning experiences for teachers by describing the development of teaching in a way that impacts how educators develop their pedagogical awareness (Dastgahian & Scull, 2021). Communities are founded on values, norms, and continuous teaching innovations that offer a pathway to significant change (Cojorn & Seesom, 2024). Ultimately, PLCs rely on teachers collaborating, which fosters professional development and shapes their instruction.

Research indicated that instructors, as a group working in a PLC, were given more opportunities to address problems of their curriculum, pedagogy, and output produced by students, increasing their understanding of teaching (Wijayanto et al., 2024). Studies contributed to understanding that robust PLCs need intentional guidance, shared outcomes, and a culture of professional growth (Çalik & Mirici, 2024).

2.2 Teacher Engagement

Bakker & Bal (2010) point out that highly engaged people fully commit to their work roles, demonstrating the ability to act with energy and a commitment to quality outcomes. Positive workplace engagement is thought to enhance team dynamics. Engagement is described mainly by

three distinct dimensions: vigour, dedication, and absorption. These aspects then cycle into an engagement spiral that maintains engagement. Dedication refers to enthusiasm, pride, and meaningful involvement, while absorption denotes a state of immersion or a blurring of time. Engagement is viewed as a unitary or stable construct comprising physical, emotional, cognitive, and behavioural aspects of engagement (Macey & Schneider, 2008). Teacher engagement, framed through professional learning activities, reflects one's emotional and motivational commitment to teaching (Høigaard et al., 2012). Higher engagement will improve teachers' knowledge, skills, and self-efficacy (Mo et al., 2021; Ostad et al., 2019).

In PLCs, particularly in the setting of Indonesian junior high schools, teachers engaged in collaborative activities through the PLCs. Teachers would brainstorm, co-plan, and share pedagogies to develop professionally (Harris & Jones, 2010; Stoll, Bolam, et al., 2006). This collaboration exposes the significance of shared visions, collectively building knowledge, and collaborative, reflective, sustainable, and learning-centred ways of operating in educational spaces (Hord, 1997; Stoll, McMahon, et al., 2006)

Teacher engagement in PLCs has an impact on professional change. Research indicates that engaged teachers are more likely to adopt student-centred practices, achieve effective learning outcomes, modify their teaching practices, collaborate with colleagues to develop new approaches, and continue to grow professionally. There is also conflicting research indicating that many teachers resist change, with a particular emphasis on secondary teachers demonstrating the most resistance compared to elementary and middle school teachers (Chen & Wang, 2015). Geletu and Mihiretie (2023) state that communities of practice do not build teachers' professional capital or support for curriculum implementation. The ambiguity surrounding implementation appears to stem from a lack of attention to teacher engagement, specifically not focusing on active participation, sustained engagement, collective learning, and shared practices (Chuang & Ting, 2021).

Relatively limited research exists regarding teachers' engagement in PLCs. For example, Ning et al. (2016) examined the relationship between teachers' value orientations and engagement in PLCs using four indicators: collaborative learning, collective orientation to student outcomes, reflective dialogue, and shared vision and values. Ning et al. (2016) classified professional learning teams into three levels of engagement: high, moderate, and low. Teams that achieved high engagement demonstrated strong indicators of engagement, including collective teacher efficacy, as evidenced by their practices. They prioritised collaborative learning as the focus of their teams, followed by student outcomes, reflective dialogue, and, lastly, a shared vision. Moderate and low engagement patterns for teams indicated collective outcomes, but a general weakness in collaborative learning and reflective dialogue was observed.

Building on the findings of Ning et al. (2016), teacher engagement is based on the characteristics of professional learning communities. Many researchers have examined these characteristics (Stoll, Bolam, et al., 2006), and more recently, Huijboom et al. (2021) suggested a conceptual framework for further studies of teacher engagement in PLCs.

2.3 TPACK

The TPACK Framework (Technological Pedagogical Content Knowledge) connects three generally regarded domains of teacher knowledge: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK) to help educators use technology in ways

that will improve or extend their teaching practices (Ali & Mohammadzadeh, 2022). According to Mishra and Koehler, technology-enhanced teaching is effective only when it is grounded in TPACK, which involves paying attention to five central technology related aspects: 1) Pedagogical Strategies for using technology to teach content; 2) pedagogy that expounds upon a simple notion of learning about a concept; 3) technology that addresses challenges faced by students; 4) knowledge about prior experience of the students; and 5) knowledge about extending existing knowledge through technology for different epistemological outcomes (Sari et al., 2021).

Mishra & Koehler (2006) constructed a framework to unpack technology integration for teaching, recognising that teaching is a complex undertaking that necessitates multiple types of knowledge. Historically, teacher education knowledge bases have focused primarily on subject matter knowledge (Voogt et al., 2013). Shulman (1986) further developed this idea in his assertion that effective teaching requires both pedagogical knowledge and subject knowledge (Liu et al., 2024). The TPACK framework provides a platform for ensuring student learning and providing support for parents and learners, and enhancing the relevance of schools and appeal for all people, providing equitable and quality educational opportunities, and allowing for teachers' professional development (Elmaadaway & Abouelenein, 2023). This supports consideration in relation to TPACK.

Bostancioglu (2018) examined how teachers view TPACK in English language teaching (ELT) for pre-service, in-service, and teacher education in Turkey, and compared the TPACK development in their pre-service teachers and in-service teachers with that of English as a Foreign Language (EFL) teacher candidates. This study's quantitative and qualitative analyses demonstrated distinct differences among these groups.

Likewise, understanding how Indonesian secondary school teachers perceive, require, and utilise technology-enhanced instruction also provides critical information that can be used to design and improve teacher education and professional development programs that are responsive and appropriate for the Indonesian educational context. With the unique contextual factors of access to digital technology, varying levels of teacher digital literacy, and the curricular implications directed by the national educational system, incorporating these perspectives helps ensure that teacher training programs are contextually relevant and functionally usable. This way, teacher preparation programs become empowered to help teachers meaningfully integrate technology into instruction in the Indonesian secondary school setting (Hasan, 2021).

Ongoing research is being conducted to validate and strengthen the TPACK framework, ensuring it remains flexible and relevant to adapt to the current educational environment. The frameworks used to guide the effective use of pedagogy must evolve with the technology itself. This evolution highlights the importance of ongoing research and innovative methods in developing teacher education and professional development (Huang et al., 2023).

2.4 PLC in the Indonesian Educational Context

In Indonesia's educational context, particularly at the Madrasah Tsanawiyah level, it is expected that schools will begin to implement programs that support teachers' professional learning and enable them to engage with professional development programs facilitated by other institutional bodies (Fadhliyah, et al., 2020). One of the initiatives is Professional Learning Communities (PLCs), which became an essential venue through which teachers work together, share their

teaching practices, and collaboratively develop instructional strategies, where PLCs practice in Indonesian junior high schools takes the form of collaborative activities such as joint lesson planning, discussions about their challenges in the classroom, and the development of innovative pedagogical techniques.

Understanding the perceptions, needs, and practices of Indonesian secondary school teachers regarding technology-enhanced instruction is essential for designing relevant and effective professional learning. Research highlights that such understandings are pivotal for enhancing teacher education and professional development strategies responsive to the local educational context (Hasan, 2021). This is particularly pertinent when considering the specific challenges present in Indonesia, such as unequal access to digital technology, varying levels of digital literacy among teachers, and the influence of a national education system that shapes curricular thinking.

Using these contextual views, PLCs can become more than a vehicle for professional growth; they can meaningfully enhance technology to support classroom instruction. In other words, not only will PLC practices better prepare and develop teachers in Indonesia, but they also have significant potential for developing aligned practices that recognise the realities of the Indonesian school system and aspire to improve the quality of instruction, ultimately leading to the integration of technology.

3. RESEARCH METHODOLOGY

A qualitative ethnographic case study design was used to investigate English teachers' engagement in PLCs for TPACK rebuilding. Observations and surveys were used to gather insights into teachers' emotional and behavioral engagement. Field notes were taken to add contextual richness and to determine when teachers used non-verbal movements and cues during the various activities.

The research was conducted in 30 selected Madrasah Tsanawiyahs in Semarang City, Indonesia, as these sites form an educational landscape that has been significantly shaped and influenced culturally and religiously. The purposive sample of schools cited in this study was selected to ensure variation in institutions (public and private), infrastructure, teachers' professional qualifications, and access to technology (computers or smartphones), while sharing a common ethos of incorporating Islamic values into their educational practices. This provision of cultural context provided a valuable starting point for understanding how teachers' learning in action incorporates a negotiated balance of religious values and contemporary teaching practices.

In this case, thirty Islamic junior high schools provided PLC opportunities, and fifty active English teachers participated in PLC activities. These PLCs enabled teachers to work together in a collaborative and supportive environment, sharing their experiences, critically reflecting on their practice, and aligning their religious and cultural values with their Technological Pedagogical Content Knowledge (TPACK). These professional learning experiences helped teachers develop their technology use, along with pedagogical creativity, through ongoing collaboration and shared values.

The participants were 50 in-service English teachers (8 males and 42 females) with various teaching histories, educational learning backgrounds, and professional development trajectories. Most had a bachelor's degree in English Education, and a few earned Master's degrees. Their experiences in professional development were also varied, ranging from previous formal professional development, including workshops and PLC-based activities, to minimal training in

technology. All participants in the PLC activities contributed unique perspectives and teaching strategies to the group as they reconstructed TPACK.

4. RESULTS

This section will generally describe the findings and explain how Madrasah Tsanawiyah English teachers are continuously involved in PLCs to develop and alter their TPACK. I will introduce and analyze the findings through the multistructural model of engagement proposed by Fredricks et al. (2004) that effectively separated teacher engagement into three interdependent dimensions: behavioral, emotional, and cognitive. The purpose of using this model to analyze the data is to provide a more nuanced understanding of how teachers engage in PLCs, not only demonstrating overt behaviors and actions (behavioral engagement), but also expressing motivations, commitments, and affect (emotional engagement), as well as mental effort, reflective thought, and meaning-making (cognitive engagement) involved in their professional learning. The findings illustrate that teachers are actively - not passively - engaged in their PLCs, enforcing the idea of PLCs as a critical source of rich support for teachers' rich professional learning.

4.1. Behavioural Engagement

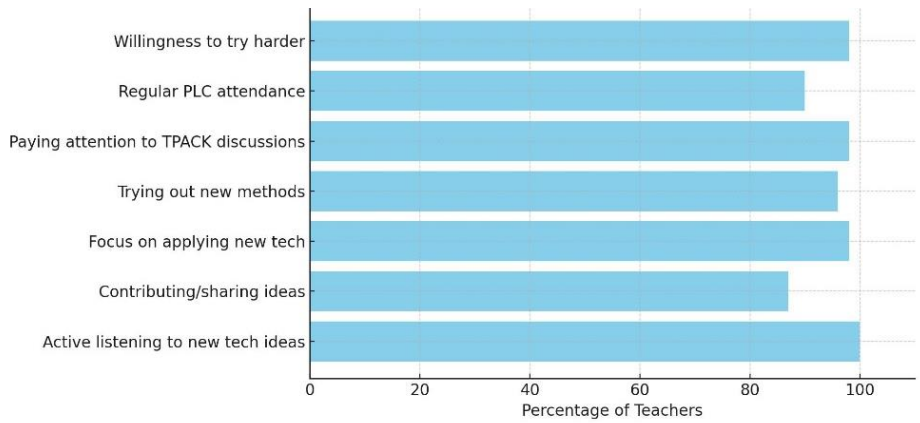

Figure 1. Behavioural Engagement of Madrasah Tsanawiyah (MTs) English Teachers in PLCs, showing both absolute frequencies (n=50) and percentages of responses across different engagement indicators

The questionnaire results demonstrate a high level of behavioral participation. All teachers (50/50, 100%) reported attentive listening during discussions on new technologies in PLC sessions. A substantial proportion (44/50, 87%) shared ideas and teaching experiences related to TPACK, whereas six teachers (6/50, 13%) reported lower levels of participation.

Nearly all respondents (49/50, 98%) indicated efforts to apply the discussed technologies in their classrooms. Additionally, 48 out of 50 (96%) reported attentiveness to the tools and practices shared by colleagues. Similarly, 49 out of 50 (98%) confirmed close attention to conversations regarding the TPACK framework. Attendance data further reflected high engagement, with more than 45 teachers (>90%) attending PLC meetings regularly. Additionally, 49 out of 50 (98%) expressed a willingness to invest additional time and effort in implementing new technologies.

Overall, MTs English teachers exhibited strong behavioural engagement, as evidenced by consistent attendance, active contributions, and commitment to implementing new practices.

4.2. Emotional Engagement

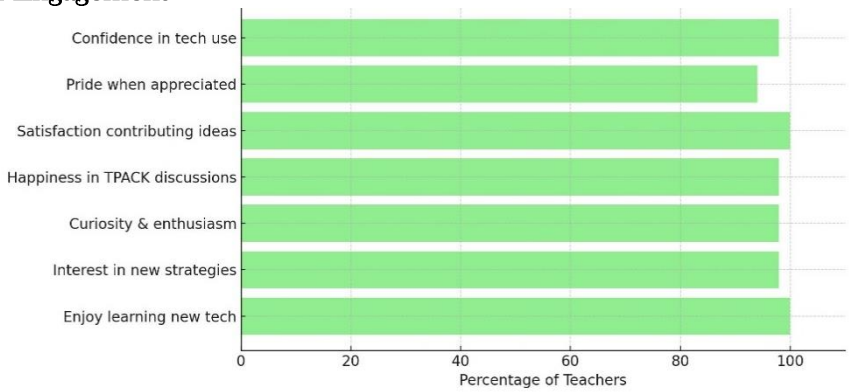

Figure 2. Emotional Engagement of Madrasah Tsanawiyah (MTs) English Teachers in PLCs, presenting both frequencies (n=50) and percentages across indicators of enjoyment, curiosity, enthusiasm, pride, and confidence.

Teachers demonstrated substantial emotional investment in their professional learning. All respondents (50/50, 100%) reported enjoying exploring new instructional technologies. Nearly all participants (49/50, 98%) expressed curiosity and enthusiasm when experimenting with innovative teaching tools. A comparable proportion (49/50, 98%) indicated eagerness to integrate technology into their classroom practices.

Professional learning community (PLC) discussions regarding Technological Pedagogical Content Knowledge (TPACK) also generated positive affect. Forty-nine of fifty participants (98%) reported feeling hopeful and energised, and all participants (100%) experienced a sense of fulfilment when contributing ideas. Recognition further reinforced these positive emotions, with 47 out of 50 (94%) indicating pride when peers acknowledged their contributions. Confidence was also notable, as 49 out of 50 (98%) reported that PLC participation enhanced their confidence in using technology. These findings suggest that emotional engagement, encompassing enjoyment, pride, satisfaction, excitement, and curiosity, was crucial in sustaining teachers' long-term commitment to developing their Technological Pedagogical Content Knowledge (TPACK).

4.3. Cognitive Engagement

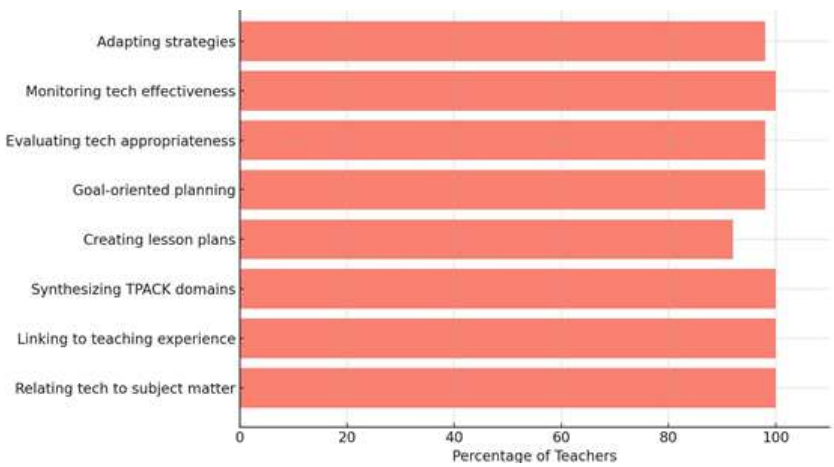

Figure 3. Cognitive Engagement of Madrasah Tsanawiyah (MTs) English Teachers in PLCs, showing both frequencies (n=50) and percentages of reflective practices, problem-solving, goal-setting, and technology integration.

Teachers demonstrated substantial cognitive engagement, as evidenced by their reflection, problem-solving, and strategic planning. All participants (100%) reported applying new knowledge of technology integration to their subject areas and relating strategies to their classroom experiences.

Every teacher (50/50, 100%) acknowledged combining technology, pedagogy, and content knowledge to design more effective instruction. Many developed lesson plans that integrated new technologies to test feasibility and as a form of metacognitive exploration.

Almost all (49/50, 98%) began lesson preparation by prioritizing learning objectives, indicating goal-directed planning. A similar number (49/50, 98%) reported consistently evaluating whether technological tools were suitable for pedagogical and content needs. All respondents (50/50, 100%) monitored whether technology directly supported student learning, while 49/50 (98%) stated that they adapted when facing technological challenges.

These results demonstrate that MTs teachers engaged cognitively through reflection, synthesis, evaluation, and adaptation, leading to pedagogically meaningful and intellectually rich technology integration.

5. DISCUSSION

The findings from this research demonstrate how MTs English teachers reconceptualize their TPACK and become engaged in as a result of being part of a Professional Learning Community (PLC). Using the multidimensional framework for engagement of Fredricks et al. (2004): behavioural, emotional, and cognitive, the findings indicated that engagement in PLCs focuses on teachers' professional development and integrates technology well. In addition, these findings also contributed to a larger conversation in the literature around engagement, collaborative learning, and teacher knowledge development.

The study demonstrated that the MTs English teachers exhibited consistently high levels of engagement in all three dimensions. Bakker & Bal (2010) state that highly engaged individuals are characterized by vigor, dedication, and absorption in their work. When the teachers describe their continued attendance, staying focused, and being active participants in the PLCs, this illustrates behavioral engagement, and aligns with the literature that suggests engagement is behavioural in the sense of investing active effort into professional learning activities (Macey & Schneider, 2008; Saks, 2006). The examples of their readiness to try new tools and strategies offer further evidence of their continued professional engagement. They align with Mo et al. (2021) and Skaalvik (2014) Findings that demonstrate that professional engagement improves teachers' self-efficacy and ability.

This research indicated remarkably high levels of emotional engagement, as evidenced by enjoyment, enthusiasm, pride, and confidence. Emotional outcomes correspond to Høigaard et al.'s (2012) view that emotional readiness influences teacher engagement. The affirmation by peers in their PLCs further enhanced teachers' sense of belonging to the community, corroborating Ning et al.'s (2016) finding that a shared vision and reflective dialogue provide commitment in influencing teachers' engagement. This suggests that PLCs offer both emotional and professional support, underlining engagement as a multidimensional and relational process.

Cognitively, the teachers in this study clearly demonstrated considerable reflection, synthesis, and problem-solving skills while reconstructing their TPACK (digital literacy). These findings support

Huijboom et al.'s (2021) framework of understanding that learning with reflective and knowledge-centered practices is critical for sustained engagement in a PLC. The teachers' ability to integrate technology, pedagogy, and content knowledge into lesson planning and critically evaluate the appropriateness of learning for students suggests a high level of purposeful intellectual engagement. This resonates with Fredricks et al.'s (2004) description of engagement as more than participation, but rather as strategic thinking and higher-order learning.

The findings provide evidence for using PLCs as a productive context for reconstructing TPACK. In line with the claims of Harris & Jones (2010) and Stoll, Bolam et al. (2006), the PLCs in this case study exhibited collaboration, reflective discussion, and practice sharing to a greater extent than with other MTs the teachers engaged with in the different literature, all of which were present. The teachers' high behavioural engagement with the PLC activities indicates that when PLCs were structured, with shared norms and values, with actionable or collaborative outcomes to aspire towards and utilising reflective discussions to debrief learning, then they can argue for formulating sustained professional learning rather than simply surface application of strategies (Zhang, 2022; Çalik & Mirici, 2024).

On the other hand, the findings supported claims from other literature that PLCs are not always effective (Chen & Wang, 2015; Geletu & Mihiretie, 2023). While this research indicated high levels of engagement generally, the wider literature suggests that this state was not simply related to the structured pedagogies used in PLCs. When teachers are motivated to engage in learning and teaching that they support, they have a responsibility to foster a collaborative approach to that learning outcome; they are more likely to have a high commitment to the PLC activities. The teachers' high commitment in this case study aligns with the 'culture in the PLC' highlighted by Ning et al. (2016) as salient in developing trust, supporting recognition, and commitment to a collective vision, which sustains engagement.

The process of reconstructing TPACK requires a shift for teachers from knowledge isolated into domains to integrated knowledge for meaningful practice in a specific context (Mishra & Koehler, 2006). The findings indicated that PLCs provided the conditions for integrated learning, as teachers made connections between their technological knowledge and subject matter and pedagogy while developing lesson plans that explicitly integrated the three knowledge domains. This aligns with Mishra & Koehler's (2006) framework of effective technology use, as evidenced by TPACK, and helps to affirm Elmaadaway & Abouelenein's (2023) assertion that TPACK can improve teaching quality and facilitate meaningful student learning.

More importantly, engagement appears to be the mediating factor between teachers' participation in PLCs and the development of TPACK. Teachers' behavioural demonstrations (e.g., introducing tools), emotional bonds (e.g., enthusiasm and confidence), and cognitive processes (e.g., reflective evaluation) enabled them to reconstruct their TPACK in practical and meaningful ways. The interpretations from sessions and studies imply that professional learning structures such as PLCs must engage the participants in multidimensional ways to achieve depth and sustainability of professional transformation.

6. CONCLUSION

This study demonstrated that Madrasah Tsanawiyah (MTs) English teachers were highly engaged behaviorally, emotionally, and cognitively, in reconstructing their TPACK through active participation in Professional Learning Communities (PLCs). Behaviorally, teachers consistently

attended meetings, shared ideas, and applied new practices, showing persistence and responsibility. Emotionally, they expressed enthusiasm, pride, curiosity, and confidence, which strengthened their sense of belonging and motivation to continue learning. Cognitively, they engaged in reflection, problem-solving, and purposeful lesson planning that integrated technology, pedagogy, and content knowledge.

Sustained engagement in PLCs enables teachers to refine their practices, adapt to technological developments, and align pedagogy with local cultural and religious values. By institutionalizing PLCs, Indonesian schools can foster technology-rich learning environments that benefit both current educators and future generations of learners.

6.1 Theoretical Implications

These findings extend Fredricks et al.'s (2004) multidimensional engagement framework by illustrating how behavioral, emotional, and cognitive dimensions interact in culturally and religiously influenced contexts such as Indonesian madrasahs. The study also enriches the literature on TPACK by demonstrating that teacher engagement is not merely an outcome of professional learning but a mediating factor that enables the sustainable reconstruction of technological, pedagogical, and content knowledge.

6.2 Practical Implications

The results suggest that PLCs can serve as an effective vehicle for teacher professional development when systematically supported. For schools and policymakers, embedding PLCs into institutional frameworks can help ensure that teachers receive ongoing opportunities to collaborate, reflect, and experiment with technology integration. Teacher training programs could also adopt PLC-based approaches, enabling graduates to prepare themselves better to integrate digital literacy with pedagogical and cultural responsiveness. In this way, PLCs provide not only a forum for sharing practices but also an ecosystem for nurturing professional resilience and innovation.

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