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Teachers' Perceptions of the Effectiveness of Teacher Learning Communities (KBG) in Creating Interactive Learning Media

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Abstrak

Tujuan dari penelitian ini adalah untuk menganalisis persepsi guru terhadap efektivitas Kelompok Belajar Guru (KBG) dalam meningkatkan kompetensi pembuatan media pembelajaran interaktif (MPI). Metode yang digunakan adalah studi kasus kualitatif di SD Negeri 02 Indralaya Utara. Data dikumpulkan melalui kuesioner kualitatif (pertanyaan terbuka) yang diisi oleh guru anggota KBG, kemudian dianalisis menggunakan analisis tematik. Hasil penelitian menunjukkan bahwa persepsi guru bersifat "kondisional positif". KBG dipandang sangat efektif sebagai "penopang sosiopedagogis" (motivator dan forum diskusi pedagogis). Namun, KBG dianggap kurang efektif (terbatas) dalam mengembangkan keterampilan teknis murni (penguasaan perangkat lunak), karena efektivitasnya sangat tergantung pada ketersediaan "ahli internal" (tutor sebaya) dan terhambat oleh keterbatasan waktu. Kebaruan penelitian ini terletak pada fokus khususnya dalam mengukur efektivitas KBG untuk pengembangan keterampilan teknis (MPI), bukan hanya peningkatan pedagogis umum. Implikasi praktis bagi kepala sekolah adalah perlunya menyediakan dukungan fasilitasi teknis yang terstruktur, idealnya dengan memberdayakan ahli internal. Penelitian ini berkontribusi dalam memberikan bukti empiris mengenai peran KBG dalam pengembangan TPACK guru.

***Kata kunci*:** *Kelompok Belajar Guru (KBG), Media Pembelajaran Interaktif, Persepsi Guru.*

Abstract

The purpose of this study was to analyze teachers' perceptions of the effectiveness of the Teacher Learning Community (KBG) in improving competency in creating interactive learning media (MPI). The method used was a qualitative case study at SD Negeri 02 Indralaya Utara. Data were collected through a qualitative (open-ended) questionnaire completed by KBG member teachers, then analyzed using thematic analysis. The results showed teachers' perceptions were 'conditionally positive'. KBG was perceived as very effective as a 'socio-pedagogical scaffold' (motivator and forum for pedagogical discussion). However, KBG was perceived as quite effective (limited) for developing purely technical skills (mastery of software), because its effectiveness is highly dependent on the availability of 'internal experts' (peer tutors) and is hampered by time constraints. The novelty of this study lies in its specific focus on measuring the effectiveness of KBG for the development of technical skills(MPI), not just general pedagogical improvement. The practical implication for principals is the need to provide structured technical facilitation support, ideally by empowering internal experts. This study contributes to providing empirical evidence regarding the role of KBG in the domain of teacher TPACK development.

Keywords: Teacher Learning Community (KBG), Interactive Learning Media, Teacher Perception

1. INTRODUCTION

Digital transformation has profoundly reshaped the educational landscape, ushering in the Education 4.0 era, which aligns with the evolving demands of the Fourth Industrial Revolution (UNESCO, 2023; Akour & Alenezi, 2022). In this context, students predominantly digital natives expect learning experiences that are personalized, interactive,

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and technologically enriched (Voogt & Roblin, 2022; Merta, et al., 2023). Traditional, passive instructional approaches, such as textbooks and one-way lectures, are increasingly insufficient for cultivating essential 21st-century competencies, including critical thinking, collaboration, and digital literacy (Hattie, 2023; Yahya, et al., 2019; Sudana et al., 2023).

In response, interactive learning media (ILM) comprising simulations, gamification, interactive videos, and adaptive quizzes has become a cornerstone of contemporary pedagogy. Empirical studies indicate that ILM enhances student engagement, motivation, and knowledge retention (Plass et al., 2020; Sidik & Fahmi, 2021; Dash, 2022). Drawing on the Cognitive Theory of Multimedia Learning, well-designed ILM reduces extraneous cognitive load while promoting active information processing, thereby facilitating deeper understanding (Mayer, 2019; Dharmalau,et al., 2021; Li, 2024).

Despite the availability of digital tools, the principal challenge lies in teachers' capacity to design and integrate effective ILM. Developing ILM requires more than technical proficiency with software such as Canva or WordWall; it entails the complex integration of technology, pedagogy, and content knowledge (TPACK) (Voogt et al., 2021). Many teachers demonstrate strength in content and pedagogy but struggle with technology, or vice versa (Tondeur et al., 2021).

To address this TPACK gap, sustainable and collaborative professional development is essential. Evidence indicates that one-off workshops are largely ineffective in cultivating complex technical-pedagogical competencies (Habibi, et al., 2020; Nugroho, et al., 2019; Petko, et al., 2025). In contrast, school-based, continuous models such as Teacher Learning Communities (KBG), or Professional Learning Communities (PLCs), represent best-practice approaches (DuFour et al., 2021). These communities provide a platform for teachers to collectively learn, experiment, share failures, and provide feedback in an ongoing cycle (Vescio et al., 2022; Brown & Smith, 2024). Within Indonesia's Independent Curriculum framework, which emphasizes differentiated and student-centered learning, the capacity to create adaptive ILM is especially pertinent (Fitriani et al., 2023).

However, a gap persists between theoretical ideals and field implementation, particularly regarding technical skills development. Most KBG literature emphasizes pedagogical improvement (e.g., formative assessment, lesson study, collaboration) rather than technical competencies, which are often concrete and individualistic, such as coding, graphic design, or ILM software operation (Hairon et al., 2021; Supriadi & Kurniawan, 2021). Teachers' perceptions are critical: if KBG is viewed as a forum for administrative discussion rather than technical learning, engagement declines (Borg, 2019). Questions remain regarding the internal mechanisms of KBG for technical skills transfer: Does a "master teacher" facilitate learning? Do teachers co-create ILM collaboratively, or rely on individual tutorials? (Rahman & Indriani, 2023).

While PLC/KBG research has traditionally focused on teacher agency, leadership, and sustainability (O'Dwyer & Louis, 2022; Mulder & Veenstra, 2023), recent EdTech studies emphasize AI adoption, learning analytics, and sophisticated authoring tools (Huang et al., 2022). Indonesian research has examined teacher use of tools such as Quizizz and Canva (Putra & Wijaya, 2023; Hermawan & Prasetyo, 2023), yet few studies analyze the collaborative social processes underlying tool creation. This study situates itself at the critical intersection of social structures (KBG) and individual technical competency development (TPACK).

The novelty of this research lies in its focused, integrative, and context-sensitive contribution to the field of teacher professional development. First, in terms of topic specificity, this study concentrates explicitly on teachers' perceptions of the effectiveness of KBG (Kelompok Belajar Guru) in supporting the creation of ILM (Interactive Learning Media), rather than addressing general pedagogical improvement. While many studies

discuss professional learning communities (PLCs) broadly in relation to instructional quality, this research narrows the scope to technological production capacity specifically how collaborative forums influence teachers' ability to design and develop digital or interactive media. By doing so, it provides a more precise understanding of how collaborative professional structures contribute to tangible instructional outputs, not merely attitudinal or conceptual growth.

Second, this study bridges two major strands of literature that are often examined separately. On one hand, research on KBG or PLCs emphasizes social collaboration, shared reflection, collegial dialogue, and collective problem-solving as drivers of professional growth. On the other hand, TPACK and educational technology (EdTech) scholarship tends to focus on individual teacher competencies, particularly technological knowledge and digital skills. This research positions KBG as a mediating structure that connects collaborative professional culture with the development of the "T" (Technological Knowledge) domain in the TPACK framework. In other words, it does not treat technological competence as an isolated individual attribute, but as something that can be socially constructed and strengthened through structured peer interaction. This integrative perspective offers a conceptual contribution by highlighting the relational pathway through which collaborative learning environments may enhance technological mastery.

Third, the study demonstrates strong contextual relevance within Indonesia's decentralized education policy environment. With increased autonomy at the school and regional levels, internal professional development mechanisms such as KBG play a crucial role in sustaining teacher capacity building. However, it remains unclear whether these internal collaborative models are sufficient for developing advanced technical skills required for producing high-quality interactive learning media. By examining teachers' perceptions, this research critically explores whether KBG structures effectively address technological gaps or whether additional institutional, infrastructural, or policy support is needed. Thus, the study contributes not only theoretically but also practically, offering insights into the strengths and limitations of school-based professional communities in advancing digital pedagogical transformation in Indonesia.

Practically, the findings offer actionable insights. School principals can use the results to evaluate whether KBG is trusted as a venue for technological skill development or whether external training investments are necessary (Lee & Louis, 2021; Rosyidah, et al., 2023). KBG facilitators can identify replicable best practices, such as peer-tutoring by internal experts versus co-creation from scratch. Academically, the study contributes empirical evidence on KBG/PLC's role in cultivating specific technical competencies, enriching TPACK scholarship, and providing a valuable Indonesian case study within global PLC literature.
Based on the background, identified gaps, and novelty, the central research question is::

1. How do teachers perceive KBG's role in enhancing technical competence (e.g., software proficiency) for ILM creation?
2. How do teachers perceive KBG's role in strengthening pedagogical competence (e.g., integrating ILM into teaching) within the Independent Curriculum?
3. Which factors within KBG (e.g., colleague expertise, meeting frequency, facilitator support) are perceived as most influential in supporting effective ILM development?

2. METHOD

This study employs a qualitative research approach, utilizing a case study design to facilitate an in-depth exploration of teachers' perceptions within a specific context SD Negeri 02 Indralaya Utara, a school that has implemented a Teacher Learning Community (KBG). The case study design was selected to provide a focused, contextualized understanding of the

phenomenon under investigation (Keeley, et al., 2019; Daflizar, 2021). Participants were identified through purposive sampling, with the sample comprising 10–15 teachers who met the following inclusion criteria: (1) active engagement in KBG activities for at least the preceding semester, and (2) prior experience whether successful or otherwise in creating interactive learning media (ILM), such as Canva or Wordwall, following their participation in KBG (Nafila & Sulisetijono, 2024; Destriani & Muslimin, 2021; Khumairok, et al., 2021).

The primary data collection instrument was a qualitative, open-ended questionnaire consisting of seven essay-style questions. These questions were specifically designed to elicit teachers' perceptions regarding the effectiveness of KBG in enhancing both technical competencies (software proficiency for ILM creation) and pedagogical competencies (integration of ILM into instruction). Data analysis followed a thematic approach. Researchers systematically reviewed questionnaire responses, identifying, coding, and categorizing emergent patterns. These themes were then synthesized to illuminate teachers' perceived effectiveness of KBG and the factors influencing its impact within the school context.

3. RESULT AND DISCUSSION

Result

This study sought to address the central research question: *"How do teachers perceive the effectiveness of the Teacher Learning Community (KBG) in supporting the creation of interactive learning media (ILM)?"* Data were derived from a thematic analysis of qualitative questionnaire responses completed by teachers at SD Negeri 02 Indralaya Utara.

Overall, findings suggest that teachers hold generally positive perceptions of KBG, although these perceptions are nuanced. KBGs are regarded as highly effective for fostering pedagogical collaboration and providing social-motivational support, yet only moderately effective as venues for developing technical competencies. The degree of effectiveness is closely tied to the presence of one or two colleagues recognized as "internal experts" or peer champions. These insights are organized into three primary themes, each corresponding to the study's sub-questions.

Theme 1: Effectiveness of KBG in Enhancing Technical Competence (Software Proficiency)

Teachers reported that KBG is moderately effective in cultivating basic technical skills but less successful in supporting mastery of more complex software functions. Peer tutoring emerged as a critical component of this learning process.Specifically, nearly all participants (13 of 15) indicated that KBG represents their primary and often only opportunity to learn tools such as Canva or Wordwall. However, these learning experiences were frequently unstructured. As one teacher reflected: *"It's very helpful, but to be honest, we only learn when Ms. Fitri (the Learning Digitalization Coordinator) has time during KBG. If she's not there, we revert to discussing administrative matters. We are only taught how to use Canva templates; it doesn't even cover more advanced tasks like creating animations."* Mrs. Putri Dian, Questionnaire Q1

These findings highlight a heavy reliance on internal experts. While teachers value learning from peers, this dependency creates a vulnerability: when expert colleagues are unavailable or unfamiliar with new software, the capacity of KBG to foster technical skill development is constrained. The findings highlight persistent gaps in the Technological Knowledge (TK) domain of the TPACK framework .At SD Negeri 02 Indralaya Utara, the KBG demonstrates strength in Pedagogical (P) and Content (C) knowledge but struggles with Technology (T) (Tondeur et al., 2021). Teachers perceive KBG as effective, yet heavily

reliant on a single expert, which aligns with Hermawan & Prasetyo (2023), who found that peer champions play a pivotal role in Canva adoption within school communities.

While peer tutoring offers convenience, it has limitations. Rahman & Indriani (2023) note that disparities in digital competencies among teachers can hinder meaningful technical collaboration. Consequently, KBG risks becoming a one-way dissemination of knowledge rather than a site of genuine co-creation (Hairon et al., 2021; Putra & Wijaya, 2023). This dependency signals that KBG has not yet fully matured as a collaborative knowledge-building environment.

Theme 2: KBG's Role in Enhancing Pedagogical Competence (MPI Integration)

Contrary to technical competencies, teachers consistently perceive KBG as highly effective in supporting the integration of MPI into classroom practice its most significant value. Qualitative responses illustrate that KBG provides a forum to discuss not only *how* to create MPI but critically *when and why* it should be used in alignment with the Merdeka Curriculum.

For example, Mrs. Miftah Indah Sari explained:*"Creating MPI is challenging, but deciding when to use it is even harder. In KBG, we discussed how a Wordwall quiz suits diagnostic assessment, while a Canva video supports students with visual learning styles."*

Similarly, Mr. Sugeng Kurniawan noted: *"I can learn Canva from YouTube, but I can't ask YouTube if it fits my students' needs. In KBG, I receive direct feedback from peers."*

These findings reinforce the core function of KBG as a site of collaborative inquiry and reflective dialogue (DuFour et al., 2021; Vescio et al., 2022). Teachers engage in what describe as collaborative professionalism analyzing pedagogical practices alongside technical knowledge. This process effectively bridges the Technological Pedagogical Knowledge (TPK) gap, allowing teachers with limited technological expertise to collectively develop Pedagogy-Technology understanding (Voogt et al., 2021; Fitriani et al., 2023). KBG thus functions as a "sense-making arena," translating curriculum requirements into practical classroom strategies (Supriadi & Kurniawan, 2021)

Theme 3: Factors Supporting and Hindering KBG Effectiveness

Teachers consistently identified informal collegiality and leadership support as key enablers, while time constraints were the primary barrier. Qualitative responses emphasized the importance of a psychologically safe, non-judgmental environment:

"At KBG, we can ask even 'stupid' questions without pressure. There is no coercion, and the principal does not grade us. Learning occurs purely out of need, unlike rigid external training." (Mrs. Siska Cahyani)

Principal support was valued not through oversight but facilitation:

"Our principal ensures we have time, a projector, and internet access, but does not interfere with technical discussions." (Mrs. Mayang Sari)

These perceptions underscore the importance of social capital and trust in sustaining KBGs. Trust enables teachers to engage with technology despite potential feelings of inadequacy. The facilitative role of the principal aligns with literature on effective distributed leadership in professional learning communities (Lee & Louis, 2021; O'Dwyer & Louis, 2022; Mulder & Veenstra, 2023). Time constraints, a widely documented challenge, remain a structural threat to the sustainability of KBG (Hairon et al., 2021).

Discussion

The discussion of these findings reveals that the Teacher Learning Community (KBG) at SD Negeri 02 Indralaya Utara functions as a socially powerful but technically uneven

professional development mechanism. While teachers perceive KBG as meaningful and supportive, its effectiveness varies significantly across domains of competence particularly when examined through the lens of the TPACK framework.

First, regarding technical competence, the findings indicate that KBG plays a facilitative but limited role in strengthening teachers' Technological Knowledge (TK). Teachers largely depend on internal peer experts to acquire basic software skills, particularly in tools such as Canva and Wordwall. This pattern reflects what Tondeur et al. (2021) describe as an imbalance within TPACK development, where pedagogical and content knowledge often outpace technological mastery. The reliance on a single "digital champion" confirms Hermawan and Prasetyo's (2023) finding that peer leaders often act as catalysts for technology adoption in school communities. However, this dependency also exposes structural fragility. When expertise is concentrated in one or two individuals, collaborative learning risks becoming hierarchical rather than reciprocal. Rahman and Indriani (2023) argue that disparities in digital competence can inhibit authentic collaboration, turning professional communities into spaces of one-directional transmission instead of co-construction. Similarly, Hairon et al. (2021) and Putra and Wijaya (2023) emphasize that mature professional learning communities require distributed expertise and shared ownership of knowledge production. Thus, while KBG offers access to technical learning, it has not yet fully evolved into a sustainable technological knowledge-building ecosystem.

In contrast, the pedagogical dimension of KBG emerges as its strongest contribution. Teachers consistently reported that KBG is highly effective in supporting decisions about when and why interactive learning media (ILM/MPI) should be used. This aligns with the conceptualization of professional learning communities proposed by DuFour et al. (2021) and Vescio et al. (2022), who describe PLCs as spaces of collaborative inquiry and reflective dialogue rather than mere skill workshops. Teachers' reflections demonstrate movement beyond tool acquisition toward pedagogical reasoning, particularly in aligning media selection with curriculum goals and student characteristics under the Merdeka Curriculum framework. This finding resonates with Voogt et al. (2021), who argue that meaningful technology integration requires the development of Technological Pedagogical Knowledge (TPK), not just isolated technical skills. Fitriani et al. (2023) similarly highlight that collective dialogue enables teachers to transform abstract technological possibilities into contextually relevant classroom strategies. In this sense, KBG functions as a "sense-making arena," as described by Supriadi and Kurniawan (2021), where policy expectations are translated into pedagogically grounded practices. Teachers' statements particularly the comparison between learning from YouTube and receiving peer feedback underscore that the unique value of KBG lies in contextualized interpretation rather than procedural instruction.

The third theme supporting and hindering factors further clarifies why KBG is more effective pedagogically than technically. Teachers emphasized psychological safety, collegial trust, and non-evaluative participation as central strengths. These characteristics reflect high levels of social capital, which Lee and Louis (2021) identify as foundational for sustainable professional learning communities. When teachers feel safe to ask questions without judgment, they are more willing to experiment with unfamiliar technologies despite perceived inadequacy. The principal's facilitative rather than supervisory leadership style also aligns with distributed leadership models described by O'Dwyer and Louis (2022) and Mulder and Veenstra (2023), where leaders create enabling conditions time, infrastructure, and trust without dominating professional discourse. However, persistent time constraints remain a structural barrier. As noted by Hairon et al. (2021), limited time allocation can undermine the depth and continuity of professional collaboration, particularly when communities attempt to address technically demanding competencies.

Taken together, these findings suggest that KBG is highly effective as a collaborative pedagogical reflection forum but only moderately effective as a technical upskilling mechanism. Its strength lies in social interaction, shared meaning-making, and pedagogical alignment, whereas its limitation lies in the absence of systematic, structured technological training. The results therefore imply that while internal KBG models are valuable for contextual integration of ILM, they may require supplementary external support, structured workshops, or distributed expertise models to fully strengthen the Technological Knowledge domain. In other words, KBG at SD Negeri 02 Indralaya Utara demonstrates strong collaborative professionalism but has yet to reach technological self-sufficiency.

4. CONCLUSION

This study finds that teachers at SD Negeri 02 Indralaya Utara hold a conditionally positive perception of the Teacher Learning Community (KBG) in fostering interactive learning media (MPI). The findings indicate that KBG is regarded as highly effective in its role as "socio-pedagogical scaffolding," serving as a source of motivation, a psychologically safe environment, and a forum for pedagogical discourse particularly in discussions about when and why MPI should be utilized. Conversely, KBG is considered only moderately effective as a "technical workshop" focused on mastering tools such as Canva or Wordwall. Its effectiveness in this domain is largely contingent on the presence of internal experts (peer tutors) and is constrained by limited time allocation. Practical implications: For school principals, KBG should not be viewed as a replacement for formal technical training. Rather, leadership support is essential, including the provision of structured time for KBG activities and the development of internal expert teachers as technical facilitators. Peer-led learning has demonstrated clear advantages in accessibility and teacher engagement.

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