

Between policy and practice: Project-based learning in Indonesian in-service English teachers' professional education and classroom teaching

Ika Suciwati ^{a,1,*}, Ramli ^{b,2}, Jianing Zuo ^{c,3}

^a STKIP Taman Siswa, Jl. Lintas Bima-Tente Palibelo, Kabupaten Bima, Nusa Tenggara Barat, 84161, Indonesia

^b Universitas Islam Internasional Indonesia, Jl. Radio Raya No.5, Cisarak, Kec. Sukmajaya, Kota Depok, Jawa Barat 16416 Indonesia

^c Monash University, Wellington Road, Clayton, Victoria 3800, Australia

¹ ikasuciwati1@gmail.com; ² ramlialfatih88@gmail.com; ³ jzuo0002@student.monash.edu



*corresponding author

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ABSTRACT

Project-Based Learning (PBL) has been widely promoted as a learner-centred pedagogy in English Language Teaching (ELT) and is increasingly emphasized in teacher professional education programs. However, limited research has examined how in-service teachers experience learning PBL during professional education and how such learning is subsequently enacted in classroom practice, particularly in online professional development contexts in developing countries. Grounded in Vygotsky's social constructivist theory, this exploratory qualitative study investigates Indonesian in-service English teachers' experiences of PBL during their Teacher Professional Education (TPE) program and their enactment of PBL in secondary school classrooms. Data were collected through in-depth semi-structured interviews with three in-service English teachers and analyzed thematically. The study highlights a pedagogical disconnect between individualised professional learning experiences and socially mediated classroom practice and suggest that effective professional education for PBL requires structured opportunities for sustained collaboration, guided mediation, and technology-supported interaction that mirror the pedagogical principles teachers are expected to implement. This study contributes to international discussions on teacher professional learning, PBL enactment, and digitally mediated pedagogy in EFL contexts.



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1. Introduction

Project-Based Learning (PBL) has gained sustained attention in educational research as an instructional approach that promotes meaningful learning through inquiry, collaboration, and the creation of authentic products. Grounded in constructivist and experiential learning theories, PBL emphasizes learners' active engagement with real-world problems, positioning knowledge construction as a socially mediated and contextually situated process (Larmer et al., 2015; Thomas, 2000). In English language education, international empirical studies have consistently reported that PBL can enhance learners' communicative competence, writing's performance, and speaking fluency by embedding language use within purposeful and meaningful tasks (Roberts et al., 2022; Purnami & Widiadnya, 2024; Arif & Sukarno, 2024). Beyond linguistic outcomes, PBL has also been associated

with the development of transversal competencies such as critical thinking, creativity, collaboration, and learner autonomy—skills widely recognized as essential for 21st-century education (Bakar et al., 2019; Putri et al., 2017).

Alongside its classroom application, PBL has increasingly been incorporated into teacher professional learning and professional development programs as a strategy for preparing teachers to implement student-centered pedagogies. In Indonesia, the Teacher Professional Education (TPE) program is designed as a national initiative to enhance teachers' professional competence and pedagogical quality (Zulfitri et al., 2019), following the Law on Teachers and Lecturers (UUGD No. 14/2005) and the Higher Education Law No. 12/2012 (Kemdikbud, 2020). Within this TPE, English language teacher education emphasizes pedagogical competence through the integration of theory, instructional design, microteaching, and teaching practicum, with a strong orientation toward learner-centred and inquiry-based instructional approaches (Widiati & Hayati, 2015). More recently, the deep learning (*pembelajaran mendalam*) approach advocated within *Kurikulum Merdeka* resonates with international conceptualizations of meaningful, student-centred pedagogy and positions project-based learning as a core instructional strategy for facilitating authentic inquiry, collaboration, and higher-order thinking (Kemdikbud, 2023; Mohan et al., 2025; Zulfitri et al., 2019).

Despite the strong policy endorsement, empirical studies suggest that Indonesian teachers continue to encounter challenges in implementing student-centered pedagogies. Research on in-service teachers' professional development has reported limited instructional interaction, assessment pressures, technological constraints, and uneven institutional support, particularly in online and blended learning contexts (Masrizal et al., 2020; Atmojo & Nugroho, 2021). Studies focusing on PBL also indicate that its complex planning and assessment requirements can be difficult for teachers to manage within existing curricular and institutional structures (Condliffe et al., 2017; Guo et al., 2020; Habók & Nagy, 2016; Marwan, 2015). These findings mirror international research showing that professional development often supports the adoption of structural aspects of PBL, while deeper, purpose-driven practices such as fostering student autonomy and authentic inquiry remain more difficult to enact (Farrow et al., 2022).

International research suggests that PBL-oriented professional development can support teachers in designing authentic learning tasks, facilitating collaboration, and shifting instructional roles from knowledge transmitters to learning facilitators (Boss & Krauss, 2018; Larmer et al., 2015). However, recent studies have also drawn attention to a persistent tension between the theoretical ideals of PBL and the realities of classroom enactment by teachers. Research across different educational contexts indicates that teachers often struggle with the time-intensive nature of project work, the complexity of assessment, and the demands of balancing curriculum coverage with open-ended inquiry (Habók & Nagy, 2016; Condliffe et al., 2017). These challenges suggest that participation in professional learning programs alone does not automatically lead to confident or consistent implementation of PBL.

This tension has prompted a growing body of scholarship to call for closer examination of teachers' lived experiences and sense-making processes in relation to pedagogical reforms. While a substantial portion of PBL research continues to focus on student outcomes, fewer studies investigate how teachers experience PBL as learners during professional education and how these experiences shape their subsequent instructional practices. Studies on teacher professional learning more broadly emphasize that pedagogical change is mediated by teachers' beliefs, prior experiences, institutional contexts, and opportunities for reflection, rather than being a direct outcome of training programs (Desimone & Garet, 2015; Opfer & Pedder, 2011). As a result, understanding how teachers interpret and enact pedagogical models such as PBL requires attention to their perspectives across professional learning and classroom practice.

Addressing this gap, the present study aims to investigate two primary questions:

1. How do the Indonesian in-service English teachers' experience Project-Based Learning during their past TPE program?
2. How do the Indonesian in-service English teachers interpret and implement PBL principles in their teaching practice after the completion of TPE program?

By foregrounding teachers' retrospective reflections, this study offers a teacher-centered and experience-based contribution to the literature on PBL and professional learning. Its novelty lies in examining perceived continuity and disconnection between professional education and classroom enactment, situating teachers' experiences within Indonesia's curriculum reforms, and incorporating insights into both face-to-face and online PBL implementation in secondary English education.

2. Literature Review

2.1. Project-Based Learning: Concepts and Pedagogical Principles

Recent research has increasingly situated Project-Based Learning within broader discussions of teacher professional learning, emphasizing that effective enactment of PBL depends not only on teachers' conceptual understanding of its principles but also on sustained, socially mediated professional support. Research from diverse educational contexts suggests that PBL-oriented professional development can enhance teachers' instructional design competence, capacity to facilitate inquiry, and understanding of collaborative learning processes when teachers are actively engaged in designing, implementing, and reflecting on project work (Boss & Krauss, 2018; Farrow et al., 2022; Larmer et al., 2015). These studies highlight that professional learning is most effective when it mirrors the pedagogical principles teachers are expected to enact in classrooms.

However, international research also consistently documents challenges in translating professional learning into classroom practice. Teachers frequently report difficulties related to time constraints, assessment complexity, curriculum alignment, and managing open-ended inquiry within accountability-driven school systems (Habók & Nagy, 2016). These structural challenges are compounded by the collaborative demands of Project-Based Learning, which require sustained coordination, clear role negotiation, and ongoing facilitation. From the learner perspective, collaboration in PBL is often hindered by uneven participation, conflicting priorities, and ambiguous task expectations, underscoring the need for explicit instructional scaffolding and project management support (Hussein, 2021). Farrow et al. (2022) further demonstrate that professional development often supports the adoption of structural elements of PBL—such as project organization, group work, and presentation formats—while deeper, purpose-driven practices, including fostering student agency, sustained inquiry, and authentic disciplinary learning, remain unevenly enacted. This pattern suggests that participation in professional development does not automatically lead to pedagogical transformation.

From a teacher professional learning perspective, this gap can be understood through research emphasizing that pedagogical change is a complex, situated, and non-linear process. Darling-Hammond et al. (2017) argue that effective professional development must be sustained, collaborative, and embedded in teachers' instructional contexts, rather than delivered as isolated training sessions. Similarly, Opfer and Pedder (2011) conceptualize teacher learning as an interaction between individual beliefs, professional experiences, and institutional conditions, cautioning against viewing professional development as a direct cause of instructional change. These perspectives suggest that teachers' enactment of PBL is shaped by how they interpret and negotiate its principles within specific professional and classroom contexts.

Parallel concerns emerge in the Indonesian context, where PBL has been formally embedded in both teacher professional education and curriculum reform initiatives. Within the Teacher Professional Education (TPE) program (*Program Profesi Guru*), Widiati and Hayati (2015) highlight that professional education for English teachers in Indonesia is designed to link pedagogical coursework with practicum experiences, enabling teachers to apply instructional principles introduced during training within authentic classroom contexts. Local studies indicate that Indonesian in-service teachers generally express positive perceptions of PBL and recognize its alignment with contemporary goals of active learning and student engagement (Masrizal et al., 2020). These findings suggest a degree of conceptual acceptance of PBL principles among teachers.

Nevertheless, empirical research in Indonesia also points to substantial constraints that complicate teachers' professional learning experiences. Studies on online and blended professional development report limited instructional interaction, constrained opportunities for peer collaboration, assessment pressures, and uneven institutional support (Atmojo & Nugroho, 2021). Research specifically focusing on PBL implementation further indicates that teachers often struggle with the time-intensive

planning and multifaceted assessment demands associated with project-based instruction (Marwan, 2015). These challenges mirror international findings and suggest that policy-level endorsement of PBL does not necessarily translate into coherent or confident classroom enactment. In addition, recent research on digitally mediated professional learning highlights both opportunities and limitations for teacher development. Trust et al. (2016) argue that online professional learning environments can expand access and flexibility, but may limit sustained dialogue, collaborative knowledge construction, and mentoring unless deliberately designed to support interaction. This insight is particularly relevant to the Indonesian TPE context, where online delivery has become dominant in recent years and may shape how teachers internalize pedagogical models such as PBL.

Taken together, international and local literature reveals a shared pattern: teacher professional learning related to PBL is mediated by the quality of social interaction, opportunities for reflection, and contextual affordances rather than by exposure to pedagogical models alone. While professional education programs introduce teachers to the conceptual and structural dimensions of PBL, the extent to which these experiences translate into meaningful classroom practice remains uneven and underexplored, particularly in subject-specific contexts such as English language education.

Drawing on these perspectives, the present study foregrounds Indonesian in-service English teachers' experiences of learning and enacting PBL across professional education and classroom practice in secondary classrooms. By focusing on teachers' retrospective reflections, this study responds to calls in the literature to move beyond outcome-oriented evaluations of professional development and instead examine how teachers make sense of pedagogical reforms within their professional and institutional realities.

2.2. Theoretical Framework: Social Constructivism and Project-Based Learning

This study is informed by Vygotsky's (1978) social constructivist theory, which conceptualizes learning as a socially mediated process shaped through interaction, language, and cultural tools. From this perspective, knowledge is not acquired individually but co-constructed through engagement with others and with mediational artifacts, such as language, symbols, and collaborative tasks (John-Steiner et al., 2011). Social constructivism foregrounds the role of sociocultural context in shaping learning practices, emphasizing that learning is influenced not only by instructional design but also by institutional structures, resource availability, and culturally situated expectations (Lave & Wenger, 1991; Vygotsky, 1978). Consequently, teachers' pedagogical practices are mediated by the material and social conditions in which teaching and learning occur. Research on teacher professional learning indicates that in contexts characterized by limited resources, curricular constraints, or strong accountability pressures, teachers often encounter challenges in enacting learner-centered pedagogies such as Project-Based Learning (Darling-Hammond et al., 2017; Korthagen, 2017). Adopting a social constructivist lens therefore allows this study to examine how Indonesian in-service English teachers experience, interpret, and make sense of PBL across professional education and classroom practice. The framework provides an analytical basis for understanding teachers' professional learning as a mediated and context-dependent process, rather than conceptualizing pedagogical implementation as a purely technical or individual endeavor.

Within this theoretical orientation, social constructivism is particularly relevant to Project-Based Learning (PBL), where learning is embedded in sustained inquiry, collaboration, and the creation of meaningful artifacts. In PBL contexts, learning occurs through dialogue, joint problem-solving, and multimodal project work, which support the development of higher-order thinking skills, including critical thinking, communication, collaboration, and creativity (Guo et al., 2020; Torres & Rodríguez, 2017). In English language classrooms, these processes are further mediated by linguistic interaction, positioning language both as a learning objective and as a central tool for meaning-making (Ngadiso et al., 2021).

Central to social constructivist theory is Vygotsky's concept of the Zone of Proximal Development (ZPD), defined as the gap between what individuals can accomplish independently and what they can achieve with guided support (Vygotsky, 1978). The ZPD offers a useful lens for understanding both student learning and teacher professional development (Hammond & Gibbons, 2005). In PBL settings, scaffolding commonly occurs through peer interaction and teacher facilitation, particularly during project planning, inquiry, and reflection stages (Larmer et al., 2015). These interactions create conditions in which learning is supported through dynamic balances of challenge and assistance.

3. Method

3.1. Research Design

This study employed a descriptive qualitative and interpretive research design to explore Indonesian in-service English teachers' experiences of learning and implementing Project-Based Learning (PBL). Qualitative inquiry is particularly suited to examining participants' lived experiences and the meanings they construct from those experiences, as it emphasizes the analysis of language, interaction, and context rather than numerical measurement (Clark et al., 2021). Accordingly, this study does not aim to evaluate the effectiveness of PBL or to establish causal relationships, but to understand how teachers interpret and make sense of PBL across professional education and classroom practice.

The research focused on teachers' retrospective reflections on their participation in the Teacher Professional Education (TPE) program and their self-reported enactment of PBL in secondary English classrooms. Data were collected through in-depth semi-structured interviews, which allowed participants to articulate their experiences, perceptions, and pedagogical reasoning in detail. This interpretive design aligns with the study's theoretical grounding in social constructivism, which views professional learning as socially mediated and contextually situated.

3.2. Research Participants

Participants were recruited through purposive sampling, a strategy that enables the selection of individuals who possess direct and relevant experience with the phenomenon under investigation and who can provide rich, information-oriented data (Clark et al., 2021). The participants were selected based on the following criteria: (1) in-service English teachers at the secondary level in Indonesia; (2) completion of the TPE program between 2020 until 2022; and (3) experience implementing PBL in their English classrooms after completing the program. The selection of this period was deliberate. Since 2020, the TPE program for in-service teachers in Indonesia has been delivered fully online, providing a shared professional learning context and reducing variability related to program modality.

Although the sample size is small, this is consistent with qualitative and exploratory research traditions that prioritize depth of understanding over breadth of representation (Table 1, Table 2). In-depth qualitative studies frequently involve a limited number of participants to allow for close examination of individual experiences and meaning-making processes (Creswell & Poth, 2018). Rather than seeking statistical generalization, this study aims for analytic generalization, contributing insights to conceptual discussions on teacher professional learning and PBL enactment (Yin, 2018).

Table 1. Demographic and professional profiles of participating in-service English teachers

Participants	Participants' Code (pseudonyms)	Age	Teaching experience	TPE location
Participant 1	P1	33	10 years	Java (online)
Participant 2	P2	42	14 years	Java (online)
Participant 3	P3	31	8 years	East Kalimantan (online)

An invitation to participate in the study was distributed through the first author's professional network and further disseminated using a snowball technique via WhatsApp. Interested teachers received an information sheet detailing the study's aims, procedures, and ethical considerations. Participants provided informed consent, were clearly informed of the study's aims and procedures, and were reminded of their right to withdraw at any stage (Duncan & Watson, 2010; Flick, 2018). Although bias cannot be entirely eliminated in qualitative research, transparent and reflexive research practices strengthen the credibility of the findings (Smith & Noble, 2014).

Table 2. Contextualized enactment of Project-Based Learning across school types, subject specializations, and project designs

Participants' code	School context	Department/ Classroom context	Project information
P1	Middle school (Grade VII-IX)	General English	Daily routines
P2	Vocational high school (Grade X-XII)	Automotive department	Procedural: jump-starting a car battery
P3	Vocational high school (Grade X-XII)	Tourism department	Job application letter and curriculum vitae

3.3. Research Instruments

Data were collected using self-designed semi-structured interview guidelines, developed in accordance with established principles of qualitative interview design (Clark et al., 2021). The interview protocol was aligned with the research questions and focused on teachers' experiences of PBL during the TPE program and their subsequent classroom practices. An initial pilot was conducted with student teachers to evaluate the clarity and relevance of the questions. Additional piloting was undertaken after translating the interview questions into Bahasa Indonesia to ensure linguistic clarity and cultural appropriateness (Clark et al., 2021). Semi-structured interviews were selected because they provide a balance between consistency across participants and flexibility to pursue emerging themes (Magaldi & Berler, 2020). While guided by predetermined questions, the interviews allowed the researcher to probe participants' responses and follow thematic trajectories that arose during the conversation. This approach enabled participants to articulate their experiences, beliefs, and pedagogical reasoning in a negotiated and reflective manner.

3.4. Data Analysis: Thematic Analysis

Applying systematic analytic procedures is essential for ensuring rigor in qualitative research (Smith & McGannon, 2017). To analyze data, this study adopted thematic analysis following the reflexive approach proposed by Braun and Clarke (2006, 2023). Thematic analysis was selected because it enables the systematic identification, analysis, and interpretation of patterns of meaning across qualitative data sets while remaining flexible across theoretical frameworks (Braun & Clarke, 2023). The analysis began with data familiarization through repeated reading of the transcripts. Initial codes were then generated inductively from the data, focusing on participants' descriptions of their professional learning experiences and classroom enactment of PBL. Codes were iteratively reviewed and clustered to construct preliminary themes, which were subsequently refined through repeated engagement with the data set. The final stages involved reviewing, defining, and naming themes to ensure internal coherence and clear distinctions between themes (Clark et al., 2021).

However, it is acknowledged that the study relies exclusively on interview data. The absence of classroom observations or instructional artefact analysis limits the ability to verify reported practices or to examine classroom interaction directly. Consequently, findings related to PBL implementation are interpreted as teachers' perceived and self-reported practices, rather than as observed instructional behavior. This limitation is consistent with the study's interpretive focus on understanding teachers' perspectives and meaning-making processes within professional learning and teaching contexts.

4. Findings and Discussion

4.1. Research Findings

RQ1. In-service English teachers' experiences of PBL during Teacher Professional Education

To address the first research question concerning how Indonesian in-service English teachers experienced PBL during their participation in the TPE program, the analysis revealed two interrelated themes: (1) learning through field practice and (2) independent, self-regulated learning shaped by limited social mediation.

a) Field Practice as Situated but Individually Mediated PBL Learning

All participants identified field practice as the most meaningful context for learning PBL during the TPE program. Although two teachers (P1 and P3) had prior exposure to PBL, they emphasized that repeated application during lesson planning, microteaching, and teaching practice strengthened their pedagogical understanding. Field practice required them to systematically apply PBL stages and adapt project designs to contextual constraints, such as the COVID-19 situation or vocational school demands. However, despite being situated in authentic teaching contexts, learning during field practice was largely individually enacted. Teachers designed lesson plans, implemented projects, and reflected on their practices independently, with lecturer input mainly occurring in the form of brief feedback on lesson plan revisions prior to teaching.

b) Self-Regulated Professional Learning in Online TPE Contexts

The second theme highlights that teachers' conceptual understanding of PBL was primarily developed through self-directed engagement with program modules, rather than through collaborative dialogue. Participants reported studying learning theories (e.g., constructivism, behaviorism), student characteristics, and instructional strategies independently, due to the fully online format of the TPE. While lecturers provided some scaffolding, typically through short consultation sessions of 10–30 minutes, opportunities for peer collaboration and sustained discussion were limited. As a result, teachers' learning experiences during the TPE reflected a form of autonomous professional learning shaped by structural constraints of online delivery.

RQ2. Teachers' experiences in implementing PBL in secondary classrooms

In response to the second research question, which explores how Indonesian in-service English teachers interpret and enact PBL in their secondary classrooms, four themes emerged: teachers' facilitative roles, student-centred learning orientations, design-in scaffolding of content knowledge, and technology-mediated project implementation.

a) Teachers as Facilitators

All teachers positioned themselves as facilitators who monitored progress, provided feedback, and minimized direct instruction during project work. P2 noted his intention to "talk less" to allow students greater control over project processes. Feedback practices varied across contexts, with some teachers prioritizing procedural accuracy over linguistic accuracy, particularly in vocational settings.

b) Student-Centred Learning and Autonomy

Teachers consistently reported granting students' autonomy over project topics, formats, and schedules. P1 stated that "it is up to them to choose", signaling that she allows students to select daily routine topics freely, while P2 enabled vocational students to determine group roles and project designs. Teachers observed increased engagement and ownership, as P3 observed that even in individual projects, peer collaboration occurred organically as students exchanged ideas on design preferences "(e.g., font, design, color)", despite occasional use of *Bahasa Indonesia* during peer discussions.

c) Teaching Content Knowledge as Scaffolding

Before initiating projects, all teachers emphasized the importance of establishing foundational content knowledge. Teachers provided vocabulary lists, text models, pronunciation practice, and even exemplar materials in the previous meeting to prepare students for project work. This preparatory instruction was viewed as essential, particularly given students' limited English proficiency as stated by P3.

d) Digital Tools as Mediation Support

Teachers integrated a range of digital tools to mediate project production, monitoring, and assessment in PBL implementation, including WhatsApp for communication, Google Docs for collaborative drafting, and platforms such as YouTube, TikTok, Zoom, and Google Meet for presentation and evaluation. These tools functioned not merely as delivery platforms but as *mediational means* that extended interaction, feedback, and collaborative meaning-making beyond the physical classroom.

Access to technology varied across school contexts and shaped how PBL was enacted. P3, who had greater access to digital infrastructure, designed projects that involved iterative drafting and synchronous interaction. Her students collaboratively developed project designs in Google Docs, received ongoing online feedback, and presented their work through Zoom or Google Meet, including

participating in simulated job interviews. As she explained, “during presentations, my students can share screen to show their curriculum vitae to the classroom members. Then, students will do a brief job interview with me in English through Google Meet or Zoom.”

4.2. Discussion

This discussion interprets the findings in relation to the stated research gap, research questions, and social constructivist framework, while situating the results within broader ELT and teacher professional learning literature.

a) Learning PBL in Online Teacher Professional Education: Individualization of Professional Learning

Addressing the first research gap concerning Indonesian in-service English teachers’ experiences of PBL during professional education, the findings indicate that teachers’ learning during the online TPE program was predominantly self-regulated and individually mediated. Although field practice offered opportunities to apply PBL principles in authentic settings, teachers largely engaged with theoretical content independently through modules, with limited dialogic interaction with peers or tutors. In addition, feedback and revisions on participants’ lesson plans prior to field practice functioned primarily as procedural scaffolding, supporting task completion and curricular alignment rather than sustained pedagogical mediation. While iterative lesson plan revisions enabled teachers to align instructional objectives, project stages, and assessment criteria, which is consistent with Harmer’s (2015) emphasis on planning as a foundation of effective teaching, this support remained largely technical and procedural. P2’s repeated revisions, necessitated by limited prior exposure to PBL and the *Merdeka Belajar* curriculum, illustrate how such feedback addressed compliance and alignment rather than fostering deeper pedagogical understanding through dialogic mediation (Aulia, 2021).

This pattern mirrors findings from international studies on online teacher professional development, which report that asynchronous and module-based formats often privilege individual knowledge acquisition over collaborative meaning-making (Trust et al., 2016; Dede et al., 2019). In a study of online professional development programs in the United States, Dede et al. (2019) found that teachers frequently valued the flexibility afforded by asynchronous and modular formats but experienced limited opportunities for sustained professional dialogue. Similar challenges have been reported in Asian contexts, where online or centrally designed professional development has been shown to constrain ongoing peer interaction and collaborative reflection, despite increased access and flexibility (Park & So, 2014; Trust et al., 2016).

From a social constructivist perspective, this mode of learning reflects partial internalization of pedagogical knowledge without sustained mediation by more knowledgeable others (Vygotsky, 1978). While teachers demonstrated procedural understanding of PBL, the limited interaction constrained learning within an optimal Zone of Proximal Development (Hammond & Gibbons, 2005).

b) Discontinuity between Professional Learning Design and Classroom Pedagogical Expectations

A central contribution of this study lies in revealing a structural discontinuity between how Project-Based Learning is experienced during professional education and how it is enacted in classroom practice. While the online Teacher Professional Education (TPE) program emphasized individual task completion and self-regulated engagement with modules, teachers’ classroom practices relied heavily on collaboration, dialogic interaction, and scaffolded mediation—core pedagogical principles of PBL. This misalignment suggests that the design of professional learning did not fully model the pedagogical practices it sought to promote.

Similar discontinuities have been widely documented in international research on teacher education and professional development. Korthagen (2017) and Darling-Hammond et al. (2017) argue that teacher education programs often espouse constructivist and learner-centered pedagogies at the level of policy and curriculum, yet organize professional learning through transmissive, fragmented, or individualistic structures. Grossman et al. (2009) further conceptualize this gap as a lack of “approximations of practice,” where teachers are insufficiently engaged in pedagogically authentic learning experiences that resemble the instructional practices they are expected to enact in classrooms. Without sustained opportunities for collaborative planning, dialogic inquiry, and guided enactment, professional learning risks remaining abstract and procedurally focused.

In EFL contexts, this tension is particularly pronounced. Borg (2015) notes that language teachers frequently develop pedagogical expertise *despite*, rather than because of, the formal design of professional development programs, relying instead on experiential adaptation and classroom experimentation. The findings of the present study extend these critiques by demonstrating that when professional learning environments do not embody the collaborative and socially mediated nature of PBL, teachers must reconstruct these pedagogical principles independently upon returning to their classrooms. In the Indonesian context, this reconstruction was evident in teachers' reliance on classroom interaction, peer negotiation, and contextual scaffolding to enact PBL meaningfully, despite limited opportunities for collaborative learning during TPE.

This discontinuity underscores the importance of alignment between professional learning design and pedagogical expectations. As Kennedy (2016) argues, professional development is most effective when it creates coherence between learning processes, instructional goals, and classroom realities. When such coherence is absent, teachers' pedagogical growth becomes contingent on individual resilience and contextual improvisation rather than systematic professional support.

c) Mediation, Scaffolding, and Learner Autonomy in PBL Classrooms

Consistent with international PBL research, teachers in this study enacted facilitative roles that promoted student autonomy while maintaining instructional guidance (Larmer et al., 2015; Thomas, 2020). Teachers' practices reflected what Littlewood (1999) conceptualizes as "supported autonomy," where learner independence is fostered through structured pedagogical mediation rather than complete withdrawal of teacher control. From a social constructivist standpoint, teachers' use of vocabulary instruction, model texts, and guided rehearsal constitutes design-in scaffolding that enables learners to participate meaningfully in project work (Hammond & Gibbons, 2005). Similar scaffolding strategies have been documented in EFL PBL classrooms in Spain (Torres & Rodríguez, 2017), Vietnam (Tran & Nguyen, 2023), and Turkey (Baş & Beyhan, 2019), particularly in contexts where learners' linguistic resources are limited.

The findings further suggest that learner autonomy in Indonesian secondary classrooms must be interpreted contextually. As in other EFL contexts with late exposure to English, such as Japan and South Korea (Butler, 2015), teachers cannot rely solely on emergent language use during projects. Instead, autonomy develops gradually through mediated participation within learners' ZPD, reinforcing the relevance of Vygotsky's framework in understanding PBL enactment beyond idealized models.

d) Technology as Sociocultural Mediation in PBL

The result of this study demonstrates that digital tools functioned as mediational artifacts that extended interaction, feedback, and assessment beyond classroom boundaries. Rather than serving as mere delivery platforms, tools such as Google Docs, WhatsApp, and video conferencing enabled collaborative drafting, real-time feedback, and simulated communicative events. From a social constructivist perspective, these digital tools operated as mediational artifacts that supported learning within students' Zones of Proximal Development by enabling scaffolded interaction, guided performance, and dialogic feedback (Vygotsky, 1978; Hammond & Gibbons, 2005). This aligns with international digital pedagogy research emphasizing technology's role in mediating social interaction and knowledge construction (Kessler & Hubbard, 2017). Studies in diverse contexts, including Malaysia (Yunus et al., 2021), China (Su & Zou, 2022), and Finland (Ilomäki et al., 2016), have similarly found that technology-enhanced PBL supports learner agency, collaboration, and reflective learning when pedagogically integrated.

Importantly, the findings also highlight that effective PBL does not depend on high-end technology. Low-tech adaptations, such as improvised materials and live demonstrations, reflect what Warschauer and Healey (1998) describe as pedagogically driven technology use, where instructional goals, rather than tools, determine learning value. This reinforces Boss and Krauss' (2018) argument that PBL success should be evaluated based on learning processes rather than product aesthetics. However, unequal access to technology constrained the extent to which such mediated interaction could be realized across contexts, underscoring the sociocultural conditions shaping PBL enactment in Indonesian secondary schools.

e) Revisiting Social Constructivism in Teacher Professional Learning

Synthesizing the findings across both research questions, this study suggests that while classroom PBL enactment strongly embodied social constructivist principles, teacher professional learning

during TPE did so only partially. Teachers enacted mediation, scaffolding, and collaborative knowledge construction in classrooms, yet experienced professional learning that emphasized individual appropriation over dialogic co-construction. This pattern echoes international calls for professional development models grounded in communities of practice (Wenger, 1998; Lave & Wenger, 1991) and collaborative inquiry (Timperley et al., 2007). Designing TPE programs that prioritize co-planning, peer observation, and sustained feedback loops may better support teachers' movement through their professional ZPD and foster deeper internalization of PBL pedagogy. In this sense, the study extends social constructivist theory from student learning to teacher professional education, highlighting the need for alignment between how teachers are taught and how they are expected to teach.

5. Conclusion and Implications

This study examined how Indonesian in-service English teachers experience Project-Based Learning (PBL) during their participation in the Teacher Professional Education (TPE) program and how they subsequently interpret and enact PBL in secondary English classrooms. Addressing a gap in the literature concerning the continuity between teacher professional learning and classroom practice, the findings provide nuanced insights into the opportunities and constraints shaping PBL-oriented pedagogy in the Indonesian context.

5.1. Conclusion

The findings reveal a notable contrast between teachers' professional learning experiences and their classroom enactment of PBL. During the online TPE program, teachers' learning of PBL was largely self-regulated and individually mediated, shaped by limited opportunities for sustained interaction with peers and instructors. Although field practice enabled authentic application of PBL principles, the absence of prolonged dialogic engagement constrained learning within an optimal Zone of Proximal Development (ZPD), as conceptualized in social constructivist theory. In contrast, teachers' classroom practices strongly reflected social constructivist principles. Teachers enacted facilitative roles, designed scaffolded learning environments, promoted learner autonomy, and leveraged peer collaboration to support project completion. Even in contexts with limited linguistic resources, teachers adapted PBL through design-in scaffolding, ensuring that students could meaningfully engage in inquiry and production tasks. Technology further functioned as a mediational tool that extended interaction, feedback, and assessment beyond classroom boundaries.

Taken together, the findings suggest that Indonesian in-service English teachers are capable of enacting PBL in socially mediated and pedagogically responsive ways, despite experiencing professional learning environments that only partially modeled such practices. This discontinuity highlights a structural tension between policy-driven promotion of learner-centred pedagogy and the design of teacher professional education.

5.2. Theoretical Implications

The study contributes to social constructivist scholarship by extending its application beyond student learning to teacher professional education. While Vygotsky's framework emphasizes learning through mediated social interaction, the findings demonstrate that teacher professional learning may fail to fully realize these principles when professional education is organized through individualized, module-based structures.

Theoretically, this study suggests that internalization of pedagogical knowledge can occur without sustained social mediation, but such internalization may be procedural rather than dialogic. Teachers in this study enacted mediation, scaffolding, and collaborative learning in classrooms, yet experienced limited opportunities to engage in similar processes as learners during TPE. This underscores the importance of conceptualizing teacher professional learning as a socially situated process that requires intentional design of collaborative and mediated learning opportunities.

5.3. Pedagogical and Policy Implications

The findings offer several implications for teacher professional education and PBL implementation in EFL contexts. First, TPE programs should be designed to model the pedagogical practices they promote. Incorporating collaborative lesson design, peer feedback, co-teaching simulations, and sustained tutor mediation may enhance teachers' professional learning within their ZPD and foster

deeper internalization of PBL principles. Second, the findings highlight the importance of contextualized scaffolding in PBL classrooms. In EFL settings where students' linguistic resources are limited, teachers need to balance learner autonomy with explicit instructional support. Policymakers and curriculum developers should recognize that PBL requires adaptive implementation rather than uniform application. Third, technology integration should be understood as pedagogically driven rather than tool-centred. The strategic use of accessible digital platforms such as WhatsApp, Google Docs, and video conferencing can effectively support mediation, monitoring, and assessment in PBL, particularly in resource-constrained contexts.

5.4. Limitations and Directions for Future Research

This study is exploratory and interpretive in nature and should be understood within its methodological limitations. The small sample size and reliance on interview data limit the generalizability of the findings and constrain claims about actual classroom interaction. The absence of classroom observations and artefact analysis restricts the ability to triangulate reported practices. Future research could adopt longitudinal or multi-method designs to examine how teachers' PBL practices evolve over time and how professional learning experiences shape classroom enactment more dynamically. Studies incorporating classroom observations, student perspectives, and project artefacts would further enrich understanding of PBL implementation in Indonesian and comparable EFL contexts. Comparative studies across regions or professional development models may also illuminate how different forms of social mediation influence teachers' professional learning trajectories.

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Declarations

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|-------------------------------|---|---|
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