

The Impact of Collaborative Project-Based Learning on Professionalism and Emotional Intelligence of Pre-Service Teachers

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The quality of primary education relies heavily on teachers' professionalism and emotional intelligence. However, many pre-service elementary school teachers struggle with emotional regulation, teamwork, and reflective teaching practices. This study explores the impact of Collaborative Project-Based Learning (PBL) on the development of professionalism and emotional intelligence among pre-service teachers. The novelty of this research lies in its focus on integrating collaborative learning with real-world teaching scenarios to develop critical interpersonal and reflective skills. Using a qualitative case study approach, data were collected through observations, semi-structured interviews, and reflective journals from participants engaged in collaborative PBL activities. The findings reveal significant improvements in teamwork, communication, emotional regulation, and empathy. Participants demonstrated enhanced ability to reflect on their teaching practices, leading to professional growth and strengthened teacher identity. Additionally, PBL fostered critical 21st-century skills such as problem-solving, creativity, and adaptability. This study recommends that teacher education programs systematically implement collaborative PBL to bridge the gap between theory and practice. Curricula should include structured mentorship, reflective feedback, and emotional intelligence training to prepare future teachers for dynamic classroom challenges. The integration of collaborative PBL can equip pre-service teachers with the skills and resilience needed to thrive in diverse educational environments, ensuring they become effective, empathetic, and professional educators.

Keywords: Collaborative Project-Based Learning, Professionalism, Emotional Intelligence, Pre-Service Teachers, Teacher Education

1. Introduction

Primary education serves as the cornerstone of the overall educational system, where elementary school teachers play a critical role in shaping the knowledge, skills, and character of young learners. To be effective educators, teachers need to possess not only mastery of pedagogical and subject knowledge but also professionalism and emotional intelligence. Teacher professionalism encompasses the ability to execute teaching duties effectively, demonstrate commitment to the teaching profession, and maintain a positive attitude toward students, colleagues, and the broader school community (Darling-Hammond, 2021; Tatto, 2021). Emotional intelligence, on the other hand, includes critical attributes such as self-

awareness, self-regulation, motivation, empathy, and social skills, which are essential for teachers to build meaningful relationships with students, foster collaboration, and navigate classroom challenges (Paiva, 2024; Vetrivel et al., 2024).

However, the current reality shows that many prospective elementary school teachers still face significant challenges in developing both professionalism and emotional intelligence. Observations conducted during Teaching Practice Programs (PPL) reveal several gaps, including difficulties in emotional regulation, ineffective communication, and a lack of reflective practices. These deficiencies hinder pre-service teachers' ability to build classroom relationships, adapt to changing environments, and manage students' diverse needs. For example, many pre-service teachers find it difficult to empathize with struggling students or address behavioral challenges without frustration. This aligns with findings by (Valente et al., 2020), who underscores the importance of emotional intelligence as a core competency for teachers in addressing classroom complexities.

When compared to international practices, teacher preparation programs in Indonesia still place significant emphasis on theoretical knowledge rather than practical, hands-on experiences that foster holistic teacher development (Novita, 2024). In contrast, countries such as Finland and Singapore, widely recognized for their high-performing education systems, prioritize the integration of innovative pedagogies such as Project-Based Learning (PBL) and collaborative learning strategies into their teacher education curricula (Chakraborty, 2024; Haatainen, 2022; Liu, 2021).

In Finland, teacher education programs emphasize the development of emotional awareness, teamwork, and critical thinking through collaborative PBL. Pre-service teachers engage in real-world projects that encourage them to apply theoretical concepts to practical scenarios, fostering both professional skills and emotional intelligence (Chakrapani, 2023; Kärkkäinen et al., 2023; Lehtinen et al., 2023). According to (Adeoye, 2024), this approach allows teachers to cultivate adaptability, problem-solving abilities, and emotional awareness-skills that are essential for navigating dynamic classroom environments. Similarly, teacher training programs in Singapore incorporate collaborative and experiential learning approaches that focus on preparing teachers for the challenges of 21st-century classrooms (Chey, 2024; Rajandiran, 2021). Pre-service teachers are trained to develop interpersonal skills, practice adaptive teaching methods, and work effectively in teams to address real classroom issues. Pre-service teachers are trained to develop interpersonal skills, practice adaptive teaching methods, and work effectively in teams to address real classroom issues (Ortube et al., 2024). The emphasis on reflective practices and collaborative learning ensures that teachers not only build strong professional competencies but also develop emotional resilience and empathy, which are critical for sustaining teacher motivation and effectiveness.

On the contrary, Indonesia's teacher education system remains largely theoretical, with limited opportunities for collaborative and reflective learning. Many pre-service teachers are unprepared to face the emotional and social demands of teaching, leading to professional stagnation and challenges in building teacher identity (Darmawan et al., 2024; Kusanagi, 2022). The lack of innovative pedagogies such as Project-Based Learning further exacerbates this issue, as it deprives prospective teachers of valuable experiences in teamwork, critical thinking, and self-reflection.

Project-Based Learning (PBL) is an instructional method that encourages students to actively engage in real-world projects, collaborate with peers, and reflect on their learning experiences (Boss & Krauss, 2022; Ngereja et al., 2020). When applied to teacher education, PBL creates an authentic and dynamic learning environment where pre-service teachers can develop both professionalism and emotional intelligence. (Le, 2024; Ortube et al., 2024) Collaborative PBL, in particular, emphasizes teamwork, communication, and problem-solving, all of which are crucial for building professional competencies (Rofik, 2022).

According to Belland et al. (2023), collaborative PBL not only enhances pre-service teachers' understanding of pedagogical content but also nurtures their emotional intelligence. The process of working on real-world projects requires pre-service teachers to regulate their emotions, empathize with team members, and communicate effectively to achieve common goals (Boss & Krauss, 2022). This experience mirrors the realities of teaching, where teachers must collaborate with colleagues, engage students, and manage classroom dynamics while maintaining emotional balance.

Furthermore, collaborative PBL provides a platform for pre-service teachers to develop reflective practices—a key component of professional growth (Rahmawati et al., 2020). Through continuous self-assessment and feedback, pre-service teachers learn to identify their strengths and areas for improvement, fostering a growth mindset. As emphasized by (Resch & Schrittmesser, 2023), reflection is essential for bridging the gap between theory and practice, enabling teachers to adapt their teaching strategies based on real classroom experiences.

Emotional intelligence and professionalism are two interrelated constructs that significantly impact a teacher's effectiveness in the classroom (Kovalchuk et al., 2022). Teachers with high emotional intelligence are better equipped to build positive relationships with students, manage classroom conflicts, and create a supportive learning environment (Valente et al., 2020; Valente & Lourenço, 2020). Emotional intelligence also plays a crucial role in teachers' ability to handle stress, maintain motivation, and sustain long-term professional commitment (Kamboj & Garg, 2021). Professionalism, on the other hand, encompasses the skills, knowledge, and attitudes that enable teachers to fulfill their roles effectively. Professional teachers are reflective practitioners who continuously strive to improve their teaching practices, demonstrate ethical behavior, and remain committed to their students' academic and emotional development (Gimbert et al., 2023). Research by Ferreira et al., (2020) highlights that teachers who possess both high emotional intelligence and professionalism are more likely to inspire student engagement, foster inclusive learning environments, and contribute to school improvement.

Collaborative PBL offers a unique opportunity to simultaneously enhance both emotional intelligence and professionalism among pre-service teachers (Hernández-Barco et al., 2021). By engaging in group projects, pre-service teachers are exposed to situations that require them to practice teamwork, empathy, and conflict resolution. These experiences help develop critical emotional competencies such as self-regulation and social awareness, which are essential for managing classroom relationships and fostering a positive learning climate (Lobczowski et al., 2021; Sviatko, 2023). Additionally, collaborative PBL aligns with the goals of 21st-century education, which emphasize the development of skills such as critical thinking, communication, and collaboration (Martinez, 2022). These skills are not only relevant for effective teaching but also contribute to the formation of a strong teacher identity, enabling pre-service teachers to navigate the challenges of the teaching profession with confidence and resilience.

This research is particularly important as it employs a qualitative approach to explore the impact of collaborative Project-Based Learning on the development of professionalism and emotional intelligence in pre-service elementary school teachers. While existing studies have highlighted the benefits of PBL in enhancing subject knowledge and pedagogical skills, there is still limited research on how collaborative PBL fosters emotional and professional growth among pre-service teachers, especially in the context of teacher education in Indonesia.

A qualitative approach is essential to capture the rich, nuanced experiences of pre-service teachers as they engage in collaborative PBL. By focusing on personal reflections, group interactions, and emotional responses, this study provides deeper insights into the processes through which collaborative PBL enhances emotional intelligence and professionalism. According to Lim (2024), qualitative research allows for the exploration of complex social

phenomena within their natural context, making it ideal for examining the transformative impact of collaborative PBL on teacher development.

The findings of this study will offer valuable implications for improving teacher education programs, particularly in integrating innovative pedagogies that address both the emotional and professional needs of pre-service teachers. As education systems worldwide strive to prepare teachers who are equipped with 21st-century skills, this research underscores the importance of fostering emotional intelligence and professionalism through collaborative, project-based learning experiences.

2. Methodology

This study uses a qualitative research design with a case study approach to explore how collaborative Project-Based Learning (PBL) influences the development of professionalism and emotional intelligence in pre-service elementary school teachers. The participants consist of pre-service teachers enrolled in an elementary teacher education program, who will engage in collaborative PBL activities addressing real-world teaching scenarios that emphasize teamwork, communication, and problem-solving. Data will be collected through observations of group activities to analyze interactions and emotional regulation, semi-structured interviews to capture participants' reflections and perceptions, and reflective journals maintained by participants to document their learning processes and emotional responses.

Data analysis will follow a thematic analysis approach, identifying patterns and themes related to emotional intelligence and professionalism, with triangulation of observation, interview, and journal data to ensure validity and reliability. This methodology allows for an in-depth understanding of how collaborative PBL shapes pre-service teachers' competencies and provides practical implications for improving teacher education programs.

3. Results and Discussion

3.1 Results

The results of this study reveal that Collaborative Project-Based Learning (PBL) significantly influences the development of professionalism and emotional intelligence in pre-service elementary school teachers. The findings are categorized into three main themes: enhancement of teamwork and communication skills, improvement of emotional regulation and empathy, and professional growth through reflective practices.

Enhancement of Teamwork and Communication Skills

Observations of collaborative PBL activities showed that pre-service teachers developed better teamwork and communication abilities as they worked together to complete real-world projects. Participants reported that working collaboratively required them to negotiate ideas, resolve conflicts, and establish shared goals. For example, one participant stated:

“Through PBL, I learned how to listen to my peers' perspectives and combine our ideas to achieve the best outcome. I feel more confident in communicating and collaborating now.”

This finding aligns with Belland et al. (2023), who emphasize that collaborative PBL provides a platform for improving interpersonal skills and problem-solving abilities. Additionally, the process of managing group dynamics encouraged pre-service teachers to develop a sense of accountability and shared responsibility, key components of teacher professionalism (Alrajeh, 2021).

Improvement of Emotional Regulation and Empathy

The study found that collaborative PBL enhanced participants' ability to regulate their emotions and empathize with others. Reflective journals revealed that pre-service teachers encountered various emotional challenges, such as frustration during disagreements or stress

in meeting deadlines. However, these experiences prompted them to develop self-awareness and strategies to manage their emotions effectively. One participant reflected:

“At first, I struggled to control my frustration when my ideas were rejected, but I realized the importance of patience and understanding others’ perspectives. I now know how to manage my emotions better.”

Moreover, participants demonstrated increased empathy by supporting peers who struggled during the project. For instance, one group helped a member who lacked confidence in presenting their part of the project by encouraging and providing constructive feedback. This outcome supports Antonopoulou, (2024), who highlights the role of emotional intelligence in fostering empathy and self-regulation, critical traits for effective teaching. By experiencing emotional challenges and overcoming them through collaboration, participants developed resilience and emotional maturity, essential for managing classroom dynamics (Sviatko, 2023).

Professional Growth through Reflective Practices

Reflective practices emerged as a significant outcome of the collaborative PBL process. Participants frequently engaged in self-reflection to evaluate their strengths, weaknesses, and areas for improvement. Semi-structured interviews revealed that pre-service teachers became more aware of their professional roles and responsibilities. One participant mentioned:

“The PBL activities pushed me to reflect on my teaching methods and how I interact with my peers. I realized the importance of continuous improvement and learning from my experiences.”

Reflective practices also enabled participants to connect theory with practice (Kaldi & Zafeiri, 2023). For example, participants applied pedagogical theories learned in class to design and implement projects that addressed real-world teaching challenges. This experiential learning process strengthened their understanding of professionalism as future teachers. According to (Resch & Schrittmesser, 2023), reflection is a critical aspect of professional development, as it bridges the gap between theoretical knowledge and practical application.

Development of Teacher Identity and Professional Confidence

Collaborative PBL was also found to contribute to the development of teacher identity and professional confidence among participants. By engaging in authentic teaching-related projects, pre-service teachers began to see themselves as future professionals capable of handling real classroom challenges. One participant expressed:

“Completing this project helped me feel like a real teacher. I gained confidence in planning lessons, working with others, and solving problems together.”

The process of working collaboratively in realistic scenarios encouraged participants to embrace their roles as educators and reflect on their career aspirations (Flores, 2020). This finding resonates with Tsybulsky & Muchnik-Rozanov (2023), who emphasizes that practical experiences play a vital role in shaping teacher identity and fostering professional confidence.

Positive Impact on 21st-Century Skills

The results further highlight that collaborative PBL enhances essential 21st-century skills such as critical thinking, creativity, and problem-solving. Participants reported that engaging in projects encouraged them to think critically about how to address teaching-related challenges and develop innovative solutions. For example, one group designed a creative teaching method using locally available materials to teach basic mathematical concepts, demonstrating both creativity and resourcefulness. This aligns with (Artawan, 2024), who underscores the importance of integrating collaborative learning into teacher education to prepare teachers for the complexities of modern classrooms. By engaging in PBL, participants developed

transferable skills that are essential for both their professional growth and future teaching careers (Darmawansah et al., 2023).

The study's findings demonstrate that Collaborative Project-Based Learning significantly enhances the professionalism and emotional intelligence of pre-service elementary school teachers. Through teamwork, participants improved communication, emotional regulation, and empathy. Reflective practices enabled them to evaluate their performance and bridge the gap between theory and practice, fostering their professional identity. The experience also enhanced 21st-century skills, preparing participants to navigate the challenges of teaching in dynamic classroom settings. These findings align with existing research (Jaiswal et al., 2021; Martinez, 2022; Rofik, 2022) and highlight the potential of collaborative PBL as an innovative strategy for improving teacher preparation programs.

By immersing pre-service teachers in collaborative and reflective learning environments, collaborative PBL not only builds professional competencies but also cultivates emotional maturity and resilience—two key factors for success in the teaching profession (Bergmark, 2023). These results underscore the importance of integrating collaborative PBL into teacher education to develop effective, empathetic, and confident educators capable of thriving in 21st-century classrooms.

3.2 Discussion

The findings of this study demonstrate that Collaborative Project-Based Learning (PBL) has a substantial impact on the development of professionalism and emotional intelligence among pre-service elementary school teachers. These findings are consistent with existing research that highlights the importance of active, collaborative learning environments in teacher education. This section discusses the implications of the results within the context of teacher preparation, emphasizing how PBL fosters teamwork, emotional regulation, reflective practices, and professional identity.

Fostering Teamwork and Communication Skills

The study revealed that collaborative PBL enhances participants' ability to work in teams and communicate effectively. Pre-service teachers experienced significant improvements in resolving conflicts, negotiating ideas, and working toward shared goals. This outcome aligns with Belland et al. (2023), who argue that PBL provides authentic opportunities for learners to develop interpersonal skills through real-world collaboration. Effective teamwork is critical in teaching, where educators must work closely with colleagues, students, and administrators to create a cohesive learning environment (Jaiswal et al., 2021).

Additionally, the collaborative nature of PBL fosters a sense of shared responsibility and accountability (Singha & Singha, 2024). Pre-service teachers learned to rely on each other's strengths, which is essential for professional growth. These findings suggest that integrating group-based PBL activities into teacher training programs can prepare future teachers to handle collaborative tasks in their professional careers, such as lesson planning, team teaching, and school-based decision-making processes.

Emotional Regulation and Empathy

One of the key findings of this study is the improvement of emotional regulation and empathy among pre-service teachers. Participants learned to manage their frustration, stress, and conflicts during the collaborative process, which mirrors the challenges teachers face in real classroom settings. This result is in line with (Antonopoulou, 2024), who emphasizes that emotional regulation and empathy are foundational components of emotional intelligence. Teachers who are skilled in these areas are better equipped to handle classroom disruptions, connect with students' emotional needs, and foster a positive learning environment.

The experience of working collaboratively required pre-service teachers to develop empathy by understanding their peers' perspectives and providing emotional support (McGowan et al., 2021). These findings suggest that PBL not only enhances technical and academic competencies but also cultivates essential social-emotional skills. As argued by Kamboj & Garg (2021), emotional intelligence is increasingly recognized as a vital trait for teachers, influencing their ability to build strong relationships and create inclusive classrooms.

Reflective Practices and Professional Growth

The results indicate that reflective practices emerged as a crucial outcome of collaborative PBL. Pre-service teachers engaged in self-assessment to identify their strengths and areas for improvement, fostering a growth mindset and a commitment to continuous learning. According to Sharma & Mullick (2020), reflection bridges the gap between theory and practice, enabling teachers to adapt their instructional strategies based on real-world experiences. In this study, participants reported that PBL activities encouraged them to critically analyze their teaching methods, interactions with peers, and emotional responses, leading to a deeper understanding of their professional roles.

Reflective practices are essential for teacher development, as they promote self-awareness and resilience (McKay, 2021). By integrating reflective components into collaborative PBL, teacher education programs can nurture future educators who are not only competent but also committed to ongoing professional improvement. These findings align with Segal (2024), who advocates for reflection-in-action as a critical component of professional learning.

Development of Professional Identity

The study also highlights the role of collaborative PBL in shaping pre-service teachers' professional identity and confidence. Participants reported feeling more prepared to take on the role of a teacher after completing group projects that simulated real classroom challenges. This result is supported by (Beauchamp & Thomas, 2022), who argue that teacher identity develops through practical experiences, reflection, and interactions with others. By engaging in collaborative PBL, pre-service teachers began to see themselves as capable professionals who could handle the demands of teaching.

Professional identity is closely tied to a teacher's ability to connect theory with practice. The findings show that participants were able to apply pedagogical concepts learned in class to design meaningful teaching projects, enhancing their confidence and competence. This aligns with the findings of (Richter et al., 2021), who emphasizes the importance of experiential learning in building a strong professional identity.

Preparing Teachers for 21st-Century Challenges

The results further highlight that collaborative PBL enhances critical 21st-century skills such as problem-solving, creativity, and critical thinking. These skills are essential for teachers to adapt to the complexities of modern classrooms and foster student-centered learning environments. The innovative projects completed by pre-service teachers demonstrate their ability to think critically and develop practical solutions to teaching challenges (Kaldi & Zafeiri, 2023). This finding is consistent with Lan, (2024), who stresses the need for teacher education programs to prepare future educators for dynamic and diverse educational contexts.

Implications for Teacher Education

The findings of this study have significant implications for teacher preparation programs. Integrating collaborative PBL into teacher education can address existing gaps in professionalism and emotional intelligence by providing authentic, reflective, and collaborative learning experiences. Teacher education programs should design curricula that

emphasize teamwork, emotional regulation, and reflective practices to better prepare pre-service teachers for the realities of classroom teaching.

Furthermore, the study highlights the importance of emotional intelligence in shaping effective and empathetic educators. Teacher education programs must incorporate emotional intelligence training, such as self-awareness and empathy-building activities, to foster holistic teacher development. As emphasized by (Valente et al., 2020), emotionally intelligent teachers are better equipped to connect with their students, manage classroom challenges, and contribute to positive educational outcomes.

This study demonstrates that collaborative Project-Based Learning significantly enhances pre-service teachers' professionalism and emotional intelligence. By fostering teamwork, emotional regulation, reflective practices, and professional identity, PBL prepares future teachers to navigate the complexities of 21st-century classrooms. The findings align with existing research (Asfahani et al., 2023; Fischer et al., 2022; Imara & Altinay, 2021) and underscore the need for teacher education programs to integrate innovative pedagogies that prioritize holistic teacher development. Collaborative PBL not only equips teachers with technical skills but also cultivates the emotional and social competencies needed to become effective, resilient, and empathetic educators (Carella & Colombo, 2024).

4. Conclusion

This study concludes that Collaborative Project-Based Learning (PBL) significantly enhances the professionalism and emotional intelligence of pre-service elementary school teachers. Collaborative PBL fosters essential skills such as teamwork, communication, emotional regulation, empathy, and reflective practices. These experiences help participants develop a stronger teacher identity, professional confidence, and critical 21st-century skills, such as problem-solving and creativity. The findings highlight the importance of bridging theory and practice in teacher education programs through experiential learning approaches like PBL. By providing real-world, collaborative learning opportunities, PBL prepares pre-service teachers to navigate classroom challenges and meet the demands of modern education effectively.

5. Recommendations

To maximize the benefits of Collaborative Project-Based Learning (PBL), teacher education programs should integrate it systematically into their curricula. Training modules should focus on teamwork, reflective practices, and emotional intelligence development. Institutions must provide support through structured mentorship, feedback systems, and tools that facilitate collaboration, such as digital platforms. Additionally, incorporating emotional intelligence training into teacher preparation will further enhance self-regulation, empathy, and resilience. Future research is recommended to explore the long-term impact of PBL on teachers' classroom performance and to examine its effectiveness across diverse cultural and educational contexts.

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