



Teachers' Reflection of Team-Teaching for Teacher Professional Development: A Phenomenological Study in a Primary School Context

Erlina
Somariah Fitriani*
Hery Muljono

Educational Administration, Postgraduate School, Muhammadiyah Prof. DR. HAMKA University - Jl.
Limau II No.2, Kramat Pela, Kec. Kebayoran Baru, Jakarta, West Java

*Corresponding author, E-mail: somariah@uhamka.ac.id

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Abstract

This study explores primary school teachers' reflections on team-teaching as a professional development approach. Using a qualitative phenomenological method, eight teachers from a private Islamic primary school were selected through purposive sampling. Data were collected using reflective journals and analyzed through thematic analysis. The findings reveal eight benefits of team-teaching, including leadership support, improved teaching practices, collaboration, and student engagement. Four challenges were also identified: teacher chemistry, absenteeism, new methods, and professionalism. The study highlights the importance of leadership, peer mentorship, and structured support for effective team-teaching implementation.

Keywords: Collaboration; primary school; reflective journal; teacher professional development; team-teaching.

INTRODUCTION

In the educational circumstances, collaboration is one of the various forms of peer teacher professional development activities (Thurlings & den Brok, 2017) that enables teachers to actively engage in their own learning process (Qureshi et al., 2023). Research on collaborative teaching remains vital as collaboration is playing an increasingly central role in the teaching profession (Krammer et al., 2018; UNESCO, 2021). Collaborative practices among teachers contribute to fostering a positive school climate (Hammar et al., 2024), facilitate innovative approaches to school development (Muckenthaler et al., 2020), and stimulates critical thinking (Svendson, 2016). Lepareur & Grangeat (2018) argue that collaboration builds a unique professional knowledge network that influences teachers' planning, execution, and reflection. This network influences how teachers plan, execute, and reflect on classroom activities, such as scientific inquiry. In addition, they create a classroom where students may develop into successful team players themselves. In the words of Fitriani (2025), collaboration is vital to any successful learning efforts. This makes teacher collaboration a necessary component in both the professional and personal growth of teachers, which finally helps the results of student learning as a whole. Though collaboration has grown to be a typical approach to address more complicated problems, such as teachers' professional development, enhancements in teaching and students' learning (Hauge & Wan, 2019), a collaboration that allows interdependence between teachers like observing, giving feedback, collaborative professional development and team-teaching is less frequent than collaborative work, such as talking about the learning of particular students or

sharing teaching resources (OECD, 2020). Under this circumstance, this current study of team-teaching model needs to be researched to explore the distinguished perspectives.

Team-teaching (TT) is a specific professional development program where two or more teachers work together in the same classroom at the same time (Carpenter et al., 2007; Crow & Smith, 2005; Murata, 2002), which involves close collaboration and regular social interaction (Muehlbacher & Hagenauer, 2023). Similarly, Krammer et al. (2018) pointed out that TT is a form of close teacher collaboration where two or more teachers share responsibility for instructing the same subject to the same group of students. This collaborative approach involves joint efforts in planning, delivering, and evaluating the course (Baeten & Simons, 2014) to accomplish shared objectives with a high degree of positive interdependence (Burns et al., 2014), which contributes to both professional and personal growth for teachers (Jang, 2006; Tsybulsky & Muchnik-Rozanov, 2019). The success of TT depends on the cooperation, engagement, and dedication of teachers, which entails two or more educators planning, executing, and evaluating lessons together (Mandal et al., 2019). In line with socio-constructivist learning theory, which emphasizes knowledge co-construction and social interaction among educators (Baeten & Simons, 2014), TT is a collaborative teaching approach that develops over time and fosters both teacher development and student engagement by encouraging collaboration, idea-sharing, problem-solving, critical thinking, and creativity (Härkki et al., 2021). Teachers can develop both professionally and personally in the context of TT when they have strong professional relationships (Degan, 2018; Villegas-Reimers, 2003).

In the perspective of Gardiner & Robinson (2009), TT provides a supportive environment for novice teachers to develop professionally. Numerous studies have demonstrated the benefits of TT for teachers, students, and student-teachers. For student-teachers, for example, TT facilitates significant collaboration that shapes their professional identity (Aliakbari & Valizadeh, 2023). For teachers, TT fosters reflective thinking (Shin et al., 2007), and improves teaching quality, promotes professional learning (e.g., pedagogical skills) and development (e.g., increased self-confidence) (Birrell & Bullough, 2005). Similarly, in the words of Witcher & Feng (2010), TT provides significant benefits to students because having two teachers with various teaching styles and strengths in different curriculum areas increases the opportunities for a wider range of students to benefit. Goodnough (2018) and Vangrieken et al. (2015) propose that collaborative environments facilitate the exchange of ideas among teachers, the development of innovative strategies, and mutual support in addressing classroom challenges. Furthermore, TT fosters the growth of critical thinking, collaboration, problem-solving, creativity, and innovation (Härkki et al., 2021) as well as the teachers' professional competence (Muckenthaler et al., 2020).

Although current studies emphasize the many advantages of TT and collaboration for teacher professional development, there is a noticeable gap in studies that directly explore the teachers' views on the implementation of TT in primary schools through their personal journal reflections. Thus, to the best of our understanding, our study is unique because most of the literature focuses on the outcomes for students or the general advantages for teachers, but little attention has been given to how teachers themselves perceive the process, challenges, and opportunities of TT within the primary school context through reflective journal. Lack of research on the practice of TT used reflective journal is also one of our considerations to prove that this current research provides a significant novelty. As it is supported by Gadsby (2022) that reflection is fundamental to every facet of growth in teacher education; it is a central competency that combines and improves all other instructional abilities. Similarly, reflection emotionally assesses

teachers' teaching experiences and rebuilds more efficient teaching strategies (Widodo & Ferdiansyah, 2018). Furthermore, previous research found that most participants view reflective journals as essential for becoming reflective teachers and consider them an effective tool for increasing teaching awareness, which in turn improves classroom performance (Zulfikar & Mujiburrahman, 2018). On top of that, the study's empirical findings reveal teachers' awareness on intentional reflection which benefited their professional growth and positively impacted the learners they taught (Dreyer, 2015). This study seeks to fill this gap by examining the unique experiences and viewpoints of primary school teachers engaged in TT. The novelty of this research lies in its focus on understanding how TT influences teachers' professional growth, collaboration dynamics, and pedagogical practices from their own perspective. The research questions guiding this study are (1) how do primary school teachers reflect the impact of team-teaching implementation as a form of professional development on their teaching practices, collaboration with colleagues, and overall professional growth through reflective journal?, and (2) what challenges do school teachers encounter on its implementation of team-teaching?

METHODS

Research design

This current research employed a qualitative phenomenological approach, which examined how individuals perceive and interpret events (Holstein & Gubrium, 1994; Schwandt, 1994). The core assumption is that knowledge is rooted in the specific meanings people assign to their lives, shaping their behaviours and beliefs. Phenomenology is particularly valuable in studies of teaching, learning, and education within educational institutions, as it enhances understanding of these processes and aids educators in designing learning programs and teaching methods tailored to diverse student populations (Prosser, 2000). Furthermore, finding the significance of people's lived experiences in relation to a particular phenomenon is the goal of a phenomenological study, which then creates a composite description of the phenomenon (Creswell, 2013).

Participants of The Study

Eight teachers of private integrated Islamic primary school participated voluntarily in the study. They were divided into four groups, which each group consisted of one general education teacher and one *diniyyah* (Islamic studies) teacher. The teachers were recruited based on the principal's recommendation, with the key criterion being their experience in implementing TT in a fourth-grade classroom. This study employed purposive sampling technique since the teachers were recruited for the reason that they could provide valuable insights into the program's effectiveness.

In group 1, NS, a 30-year-old general teacher with a bachelor's degree in elementary school teacher education and three years of experience, taught class IV A alongside YW, a 27-year-old *diniyyah* teacher with a high school education and two years of experience. Group 2 included VV, a 27-year-old general teacher with a bachelor's degree in physics education and three years of experience, teaching class IV B, paired with MI, a 25-year-old *diniyyah* teacher with a bachelor's degree in Arabic language education and two years of experience. Group 3 featured NJ, a 30-year-old general teacher with a bachelor's degree in biology Education and six years of experience, teaching class IV C, and ZP, a 25-year-old *diniyyah* teacher with a diploma in *Idad Lughowi* and two years of experience. Finally, group 4 included YF, a 34-year-old general teacher with a bachelor's degree in Arabic language education and seven years of experience,

teaching class IV D, alongside DP, a 29-year-old *diniyyah* teacher with education from *Ma'had Zubair* and 1.5 years of teaching experience.

Data Collection and Data Analysis

Journals are utilized as a teaching tool to promote student reflection, critical thinking, and self-analysis (Anderson, 2012). This research utilized reflective journals to garner the data. Each teacher participant was requested to write reflective journal for one semester aiming to obtain their own personal experiences and evaluation of their own teaching with their peers. In qualitative research, particularly within the behavioural sciences, reflective journals are a valuable method for gathering data, offering insights into a person's emotions (Cohen et al., 2013). The information collected from these journals is considered process data (LeCompte & Goetz, 1993), revealing what happens during the implementation of a program or change and how participants perceive these events. This data also allows researchers to assess the effectiveness and impact of the process or change (Bashan & Holsblat, 2017).

For data analysis, we employed a thematic content analysis (Braun & Clarke, 2022; Miles et al., 2014). We methodically discovered and validated initial themes in the data. With this approach, recurrent ideas, concepts, or problems can be thoroughly examined by classifying and examining patterns or themes that show up in the data. In order to find additional examples that were thematically related or pertinent, we repeatedly compared the data to these initial themes throughout the analysis. In order to ensure that the themes appropriately reflect the data and offer significant insights into the research question, this iterative process aids in their refinement and solidification. By finding patterns in various data sources, the method works especially well in qualitative research to comprehend complex phenomena.

Ethical Consideration

Prior the study, we explained the research methodological process, the objectives of the study, and its significance to the participants, and we ensured them that their identities would be kept private. We also provided informed consent, with all personal information kept confidential and anonymized. Every participant gave their permission to be part of our study voluntarily by writing their reflective journals. To protect the identities of participants, we followed accepted anonymization practices by using initials. The study aimed to avoid harm while emphasizing potential benefits, such as better teaching practices.

RESULT AND DISCUSSION

Result

The study attempted to explore primary school teachers' reflection on the impact of implementation of TT as a form of professional development through reflective journal on their teaching practices, collaboration with colleagues, and overall professional growth and the challenges they encounter during its implementation. Two research findings consist of the teacher's reflection on the impacts of TT implementation, which eight themes were identified (see Figure 1) and the challenges the teachers encountered during their practices, which four themes were identified (see Figure 2) are elaborated below.

Teachers' Reflections on The Impact of Team-Teaching Implementation



Figure 1. Teachers' reflection

The principal plays a supportive leadership role in maintaining classroom stability by assigning additional teachers to assist in understaffed classes or stepping in personally when necessary (YW). To ensure meaningful learning experiences, the school implements team-teaching during daily activities, such as prayer, *Quran* reading, teaching etiquette, and special programs like *Kailullah* and quality time before naptime (ZP). This approach also positively influences teacher behavior, as disciplined and professional team members inspire their partners (YW). Additionally, team-teaching helps build emotional bonds through heartfelt conversations and effective problem-solving activities, strengthening the connection between teachers and students (ZP). Observations show that the learning environment improves, with students appearing relaxed and content despite large class sizes, as the collaboration between *Diniyyah* and general teachers ensures smooth classroom management (NJ). Furthermore, teamwork enhances student focus and discipline, as constant teacher supervision reinforces positive behavior (MI). A clear role division exists during lessons, with one teacher leading instruction while the other supports, maintaining a conducive classroom atmosphere (MI, VV). Finally, team-teaching allows for mutual evaluation, enabling teachers to assess and refine their skills while demonstrating professionalism by applying knowledge gained from diverse teaching experiences (DP).

The Challenges of Team-teaching

We identified four key themes related to challenges of team-teaching that the teachers faced including 1) commitment and chemistry between teachers; 2) absenteeism; 3) adjusting to new teaching methods; and 4) maintaining professionalism. The key lies in the commitment of both teachers in the classroom. If they can establish good chemistry, the team-teaching activities in class will be both easy and enjoyable (ZP). Another challenge is when one teacher is absent, leaving the other to manage alone, which can be difficult as we have become accustomed to working together (NS, NJ, YW). This new approach motivated us to better manage the class and work together more effectively. With the team-teaching activities completed thus far, collaboration, communication, and a positive environment are all going well (MI, VV, DP). Initially, I was confused about implementing the team-teaching process, but I was partnered with

a senior teacher who had already implemented team-teaching in the previous year. Managing the class became easier as I learned by directly observing my partner (VV, MI).



Figure 2. Challenges of team-teaching

Discussion

Teachers' Reflections on The Impact of Team-Teaching Implementation

The first identified theme of teachers' reflection in this current study is the role of leadership, which plays a profoundly essential aspect in leading an organization. Over the last two decades, for example, researchers have examined the impact of leadership on school development and change, emphasizing the importance of leadership roles that are effectively shared and distributed throughout the school community (Leithwood & Azah, 2016). Previous research revealed the effectiveness of school leadership in improving the school quality standard (Lestari et al., 2024). The study shows that the practice of principals' instructional leadership improve teachers' sense of efficacy through teacher collaboration (Çoban et al., 2023). Moreover, Fullan (2014) also contends that effective leadership is critical to the success of professional development initiatives such as TT because it provides the necessary resources and supports to sustain collaborative efforts. As it is acknowledged by Grissom et al. (2019), professionalisation of school leaders will result in better leadership practice. One of its practices is implementing TT in the classroom, which aims to improve teacher professional development and collaboration. Furthermore, interventions and school conditions can either impede or promote professional learning and collaboration among teachers (Dogan et al., 2019; Jensvoll & Lekang, 2018; Schaap et al., 2019). In this circumstance, the results emphasise that a good leadership style and leader supports provide a great contribution to a psychologically safe environment where teachers could take opportunities, share duties, and develop professionally by joint practice among teachers who implement the practice of TT.

In the perspective of *Admiraal* et al. (2021), one of effective interventions for enhancing teachers' professional development and shared practices is collaborative work and learning activities, such as TT and collaborative action research. Meaningful learning experiences as the second theme can be seen from students' daily activities such as *Quran* reciting and praying, which reflect the holistic nature of the Islamic school context. These findings suggest that TT created opportunities for integrated learning that is not only academically rich but also spiritually

relevant to students' lived experiences. This is in line with previous findings that TT allows teachers to create more engaging and interactive lessons, as well as holistic learning experiences (M. Friend et al., 2010). The integration of religious and academic subjects through TT also promotes the development of well-rounded students, as emphasized by Vygotsky's (1978) research on the social learning role in cognitive development. Therefore, the results occurred not only because of the structure of TT itself but also due to the relational and contextual dynamics that fostered integrated, meaningful, and socially grounded learning experiences.

The third identified theme is the change of teacher behavior. Teachers' journal reflections indicated that TT positively impacts teacher behaviour, with discipline and professionalism being shared between peers. These behavioral shifts can be attributed to the collaborative nature of TT, which encourages peer observation, shared responsibility, and continuous self-evaluation. Similarly, Hartwig & Schwabe (2018) pointed out that collaboration among teachers can have a significant impact on teachers' instructional behavior. This statement is consistent with the theory of social capital in education, which asserts that collaborative working relationships encourage the transmission of skills, positive behaviors, and knowledge among peers (Nahapiet & Ghoshal, 1998). In Belgium, the research findings indicate that when teaching in groups as opposed to alone, teachers were more able to demonstrate effective teaching practices (Decuyper et al., 2025). TT fosters an environment of mutual respect and accountability, which improves teacher performance and strengthens commitment to professional standards (Leana, 2011). Furthermore, strong interpersonal and professional relationships among educators help to build social capital (Fullan, 2016; Hargreaves & Fullan, 2012). These dynamics not only improve teacher performance but also strengthen long-term commitment to quality instruction.

Moreover, TT enhances emotional bonds between teachers and students, as noted in the reflective journals. This finding corresponds with research findings, which revealed that relationships between teachers and students support students' academic success, well-being, and adjustment to school. Relationships between teachers and students as well as students' attitudes towards school appear to be enhanced by compatible emotional styles (Nulman & Alkalay, 2025). Based on prior study by Muehlbacher & Hagenauer (2023) factors such as the TT environment, shared values and goals, collaboration dynamics (e.g., workload distribution), and lesson elements (e.g., diverse teaching methods) evoke emotions like joy, gratitude, anger, or insecurity in the other teacher. TT allows teachers to work more closely with students, providing individualized attention and creating a supportive classroom environment. The reason why these behavioral changes occurred is that TT provides a unique structure in which teachers are not only held accountable by their peers but also supported emotionally and pedagogically. This dual influence fosters reflective teaching, stronger relational ties, and ultimately a shift in behavior toward more student-centered and collaborative practices.

In terms of teacher relationship, the study found that high level of teacher involvement in TT was associated positively with increased perceptions of trustworthiness among colleagues (Kolleck et al., 2021). This implies that TT enhances pedagogical collaboration and fosters relational trust through shared responsibilities and consistent interpersonal engagement. The enhanced classroom environment, characterized by better control and comfort for both students and teachers, is a key outcome of TT. Studies by Friend (2020) also emphasize the positive effects of TT on classroom dynamics, where two teachers can more effectively manage larger or more diverse groups of students. This study highlights the significant impact of team teachers'

emotional experiences on their work engagement (Muehlbacher et al., 2024). These outcomes occurred because TT redistributed the emotional and instructional burden typically borne by a single teacher that created space for proactive behavior management and responsive teaching strategies. Previous research also revealed the improvement of students' collaborative work (Riddell et al., 2021), which is likely due to the modelling of collaborative behavior by teachers and the use of co-facilitated group learning strategies. In the views of Waber et al. (2021), successful TT requires effective communication, mutual trust and support, shared perspectives, and key teacher traits such as openness, reliability, flexibility, and receptiveness to feedback.

Reflective journal entries highlighted the impact of TT on improving student focus and discipline, which is identified as the sixth theme. Research by Thousand et al. (2006) confirms that the presence of two teachers in the classroom helps maintain student attention and reduces distractions. Additionally, improved discipline is a natural result of having more than one teacher available to monitor student behaviour and provide individualized attention when necessary. When teachers collaborate on their planning and teaching, they are better able to meet the needs of diverse students and fulfil their legal responsibilities (Thousand et al., 2006). In terms of English proficiency, TT consisting native and non-native English speaker also contribute to students' English proficiency improvement. The results of the attitudinal survey suggest that students generally had a positive view of co-teaching, attributing its success to three key advantages: an optimal linguistic environment, complementary teaching strategies, and a supportive cultural atmosphere (Rao & Yu, 2021). Thus, the findings take place because TT creates a dynamic, responsive learning environment where both academic and behavioral goals are supported through collaboration, modeling, and diversity of instruction.

The role of division and support as the seventh theme in the impact of TT was considered as a critical component of the approach's success. Prior study concluded that although exchange is the most preferred form, student teachers more frequently engage in higher-level collaboration such as division of work and co-construction (Bush & Grotjohann, 2020). The teachers' partnership in doing their tasks requires shared planning, instruction and assessment of the pupils (Fluijt et al., 2016; Pratt et al., 2017). This result came about as role clarity not only avoids overlapping duties but also promotes a feeling of efficiency, purpose and cooperation among teachers. Evaluation and self-improvement as the eight identified theme is the important aspect of successful TT implementation. Teachers also appreciated the chance for mutual feedback and self-evaluation, which helped them advance professionally. The literature on reflective practice as a crucial element of professional development supports this view. As it is pointed out that reflective practice enables educators to evaluate their methods critically, pinpoint areas in need of development, and create fresh approaches (Schön, 2017). It is significant to remember that effective professional collaboration results in improvements for both the teachers and the learning and achievement of the students (Hargreaves & O'Connor, 2018). The teachers emphasized the importance of various interpersonal and structural factors, including team dynamics, positive mindsets, available resources, professional development opportunities, effective leadership, university-based training, accountability, shared responsibilities, and clear communication (Damore & Murray, 2009). These factors collectively create a supportive ecosystem in which teachers feel empowered to collaborate, reflect, and grow. Thus, the outcomes of this study occurred not merely because of the TT structure itself, but for the reason that there is good alignment between organizational support systems and teachers' intrinsic motivation to develop their practices.

The Challenges of Team-Teaching

The second purpose of this present study is to explore the teachers' challenges in implementing TT. From the teachers' reflective journals, we identified four themes including commitment and chemistry between teachers, absenteeism, adjusting to new teaching methods, and maintaining professionalism. In terms of commitment and chemistry between teachers, Griffin & Care (2015) highlighted that collaboration is a process of functional interdependence in an effort to coordinate abilities, resources, and rewards. It implies that the success of TT relies on shared purpose, and a mutual respect and trust among teachers. Research indicated that teachers who engage in collaboration experience only a slight reduction in their autonomy and tend to recognize its benefits. However, when collaboration is driven by pressure from the principal, it does not lead to increased collaboration or greater perceived benefits (Muckenthaler et al., 2020). Correspondingly, because team-teaching was more engaging than solo teaching, it gave teachers greater confidence when putting theory into practice (Roberts et al., 2023). It indicates that the practice of team-teaching has improved the chemistry between teachers. These findings highlight that the success of TT depends not only on instructional planning but also on the emotional and relational alignment between co-teachers.

The issue of absenteeism is also an obstacle which needs to be well managed by both teachers and principal in the context of teacher collaboration. In the words of Do & Hascher (2023), having enthusiastic, focused, and committed teachers is especially crucial because there are drawbacks to team-teaching in addition to its advantages, such as disputes amongst team teachers. One of the disputes is teacher's absenteeism, which disrupts the learning process. O'Sullivan (2022) noted that teachers' absenteeism is caused due to poor motivation and poor remuneration. In the study of Keefe & Moore (2004), the co-teaching dynamic can suffer when one teacher is absent, particularly if the remaining teacher is overburdened with the extra duties. As Friend (2020) emphasized that absenteeism in a TT model can cause disruptions in the learning process. Furthermore, research indicates that regular cooperation is essential to the effectiveness of team-teaching, and that an imbalance may be created in the classroom when one teacher is absent (Scruggs et al., 2007). Adjusting to a new teaching method, which they used to teach alone, becomes a challenge as well. In the views of Villa et al. (2013), implementing a new teaching model, like TT, frequently necessitates a period of adjustment, which teachers must learn how to divide duties, deal with role changes, and create new collaborative techniques. Teachers used to independent, traditional teaching methods may find the adjustment period especially difficult (M. Friend, 2020). However, research has shown that TT creates more dynamic and engaging learning environments once teachers get used to it (Magiera & Zigmond, 2005). The results of this study occurred because successful TT relies not only on structural support but also on consistency, trust, and adaptability. Without sustained presence and clear role negotiation, the collaborative model risks becoming fragmented, reducing its intended benefits for both teachers and students.

The importance of maintaining professionalism during the implementation of TT was the fourth key theme. Tsybulsky & Muchnik-Rozanov (2019) found that TT improves teachers' professional and personal growth. Teachers who were new to the model expressed initial confusion, but noted that working with more experienced colleagues made it easier for them to adjust. This is supported by research on mentoring and professional development, which highlights the importance of experienced teachers guiding and supporting less experienced colleagues during professional transitions (Bacharach et al., 2008). Similarly, pairing teachers with varying levels of experience can result in better teaching practices, as newer teachers benefit

from the guidance and expertise of their more experienced colleagues (Murawski & Lochner, 2011). One of the most significant forms of collaboration in education is co-teaching, which is also seen as a key component of teachers' professionalism (Hargreaves & O'Connor, 2018). Maintaining professionalism throughout this process is critical to ensuring that TT remains effective and that both teachers continue to grow in their practice. Therefore, the challenges identified in this study occurred due to combination of systemic factors including insufficient leadership guidance, lack of co-teaching frameworks, and limited training on collaborative professionalism. Addressing these issues is essential to ensure that TT does not compromise but rather enhances teachers' professional identity and instructional integrity. In terms of training program, the study revealed notable advantages of the training course, with attendees exhibiting better performance on the co-teaching post-test and cooperation scale (Alsudairy, 2024).

CONCLUSION

Conclusion

This current study employed teachers' reflective journals to garner the data on the impacts of TT practices as an alternative approach for sustainable teacher professional development. The findings underline the importance of teacher collaboration and the practice of TT which benefits teachers' personal and professional development particularly. Furthermore, this study has pedagogical implications and practical implications. For pedagogical implication, TT model foster a more diverse and dynamic learning atmosphere for both teachers and students. In addition, TT model increases the teachers' creativity to attempt new teaching methods and facilitates more collaborative work as well. For practical implication, the need of regular teacher professional development program and systematic mentorship program becomes the priority agenda for school principal as a practice of leadership program.

Suggestion

The practice of TT model has the potential to develop the quality of teaching, and teacher and student performance at the same time. This study, however, has some limitations including the limited number of participants and school. Thus, further research needs to include some schools with different level of education, which have implemented TT approach. By including some schools and teacher participant, the researchers can compare the results, which are likely to provide different perspectives and add the literature review.

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