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Examining the path effects of elementary school English teachers' beliefs, efficacy, decision making and behaviors in teaching English as a foreign language

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Abstract

This study examined the interrelationships among professional development activities (PDAs), teaching beliefs (TB), teacher efficacy (TE), decision-making (DM), and teaching behaviors (TBH) among elementary school teachers of English as a foreign language (EFL) in Taiwan. Using a path analysis approach, the study explored how participation in PDAs influenced teachers' cognition and instructional practices. The findings revealed four key relationships: (1) PDAs positively predicted both TB and DM; (2) DM was positively associated with TB and TE during reflective processes; (3) DM positively predicted TBH; and (4) post-teaching TBH was significantly predicted by TB and DM in reflection, but negatively associated with TE. These results highlight the important role of PDAs in fostering positive teaching beliefs and effective decision-making, which ultimately contribute to teaching behaviors. Notably, the negative association between TE and TBH suggests that higher self-perceptions of teaching efficacy may not always translate to instructional behaviors, particularly in the reflection process. The study emphasizes the value of PDAs not only for teacher development but also for enhancing instructional decision-making and practice. Accordingly, EFL elementary teachers should be encouraged to engage in ongoing professional development activities to strengthen their teaching beliefs, efficacy, and decision-making, which in turn shape their behaviors in the classroom.

Keywords: Decision-making, EFL, Elementary English education, Professional development activities, Teacher efficacy, Teaching behaviors, Teaching beliefs.

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Contents

Contribution of this paper to the literature
The paper's primary contribution is the discovery that, unlike previous research which typically examined only one or two relationships among beliefs, efficacy, decision-making, and behaviors, it uniquely models all four constructs together to reveal their comprehensive path effects in elementary EFL teaching.

1. Introduction

1.1. Professional Growth

One of the most precise concepts for describing professional development and its potential effects on teaching is teachers' professional growth (Clarke & Hollingsworth, 2002). In particular, growth in the processes of planning, designing, implementing, and evaluating lessons is seen as essential in a teacher's professional career. To conceptualize the idea of professional development, Clarke and Hollingsworth (2002) proposed a rhombus-domain model encompassing four distinct and interconnected domains: the external domain (ED), the personal domain (PD), the domain of practice (DP), and the domain of consequences (DC).

The external domain (ED) includes both formal and informal activities conducted within or outside the school, such as workshops, observations, community engagement, teaching diaries, case studies, co-teaching, and action research (Richards & Farrell, 2005; Wayne, Yoon, Zhu, Cronen, & Garet, 2008). The personal domain (PD) comprises teachers' beliefs, knowledge, and thoughts that guide their classroom actions. These elements are shaped by newly received information or experiences (Komba & Nkumbi, 2008) and consist of four features: existential presumptions, alterity, affective and evaluative loading, and episodic structure (Nespor, 1987).

The domain of practice (DP) refers to actual classroom behaviors, involving the selection of instructional objectives, content, methods, materials, exercises, resources, and assessments (Levin & Wadmany, 2006). It encompasses four aspects: knowledge and curriculum, teacher-student relationship, teacher's role, and student diversity. Finally, the domain of consequences (DC) refers to changes in student learning outcomes, often shaped by the interaction of external influences, personal teaching notions, and classroom performances (Desimone, 2009). It serves as a comprehensive evaluation of teaching results before, during, and after instruction.

Clarke and Hollingsworth (2002) identified two processes through which these domains interact: action and reflection. In the action process, teachers who face instructional challenges seek external resources (ED) to enrich their personal knowledge (PD), which in turn influences their teaching practices (DP). DC, as a consequence, further shapes their teaching behaviors. In the reflection process, teachers re-evaluate their PD, ED, and DP in light of experiences from DC. When necessary, these reflections lead to adjustments aimed at enhancing future instructional effectiveness. This continuous process of aligning beliefs with experience results in improved instructional and learning effectiveness.

From this perspective, the four domains, ED, PD, DP, and DC, are interconnected and dynamic, depending on whether the teacher is taking action in active problem-solving or reflective learning. DP serves as the implementation point of both ED and PD, while DC functions as an evaluative indicator of the inferred outcomes of these interactions (Clarke & Hollingsworth, 2002).

1.2. Teacher Efficacy

Teacher efficacy is another antecedent of DC, working alongside ED and PD to organize, manage, and successfully perform teaching tasks (Cayci, 2011; Klassen, Tze, Betts, & Gordon, 2011). According to Bandura (1997) teacher efficacy refers to one's self-reflection or confidence in their capability to design and implement lessons, which can predict success across all aspects of teaching.

Teacher efficacy is commonly understood to consist of two dimensions: personal efficacy and outcome expectancy (Tschannen-Moran, Hoy, & Hoy, 1998). The former reflects a teacher's confidence in their own ability to facilitate learning, whereas the latter is defined as their beliefs about their teaching efforts, which lead to expected outcomes (Tschannen-Moran & Hoy, 2001). Together, both demonstrate how teachers approach their instructions, and a strong sense of efficacy can contribute to more effective teaching and student learning.

Previous studies have suggested that teacher efficacy plays an influential role in shaping both teaching practices and the student learning process (Morris, Usher, & Chen, 2017; Tschannen-Moran & Hoy, 2001). For example, teachers who are positive about their abilities tend to explore new teaching methods and demonstrate motivation to design effective lessons (Calik, Sezgin, Kavgaci, & Cagatay Kilinc, 2012; Klassen et al., 2011). Ultimately, a strong sense of teaching efficacy increases the likelihood of achieving student success (Duyar, Gumus, & Sukru Bellibas, 2013).

1.3. Decision Making as a Mediator of Teaching Behaviors

Decision making (DM) involves the process through which instructors design, implement, and revise teaching strategies based on their professional knowledge and practical factors within the classroom (Lunenburg & Ornstein, 2013). It acts as a bridge connecting teachers' thoughts with their instructional actions before, during, and after lessons. Given its role in shaping effective teaching, decision-making is regarded as a crucial skill that educators continuously develop throughout their teaching careers.

According to Richards and Lockhart (1996), teachers normally make decisions through three stages. The first is planning decisions, where teachers consider what to teach and how to teach it. This stage includes the consideration and selection of instructional objectives, materials, activities, and assessments, as well as students' characteristics and learning needs (McCutcheon, 1980). The second stage involves interactive decisions, which take place in real time during instruction. Teachers respond to classroom events or student behaviors, particularly when unexpected situations arise (Borg, 2003; Borg, 2006). The third stage, evaluative decisions, occurs after instruction, when teachers reflect on students' behaviors, difficulties, and outcomes for improving the overall effectiveness of the lesson. These reflections often lead to necessary adjustments for future lessons (Richards & Lockhart, 1996).

Importantly, decision-making in teaching is not a linear or one-time process, but is cyclical in nature. Changes in one decision often trigger adjustments in others, highlighting the interdependent and iterative process of instructional decisions (Gray, 2001). This interplay reinforces the notion that decision-making is central to teaching and learning (Jasper, 2006).

1.4. Study Purpose and Research Questions

As Clarke and Hollingsworth (2002) note, DC is distinct from the other three domains, as it focuses on student learning outcomes, which are often demonstrated through high scores or achievement in school. DC is frequently conceptualized as students' individual efforts toward achieving learning goals (Sheu, 2019), and, therefore, is excluded from this study.

Most studies have found a positive relationship among ED, PD, and DP in promoting teacher growth. For instance, Levin and Wadmany (2006), Sheu (2019), Stewart (2014) and Whitcomb, Borko, and Liston (2009) reported that professional development activities and teaching beliefs are closely associated with teachers' classroom experimentation.

Additionally, Calik et al. (2012) and Duyar et al. (2013) noted that teacher efficacy is interconnected with ED and PD and often influences teaching decisions. Teachers interpret information from professional development activities, integrate it into their knowledge and beliefs, and apply it through teaching decisions (Jasper, 2006; Richards & Farrell, 2005).

Therefore, professional development activities, teaching beliefs, and teacher efficacy are antecedents of decision-making (Richards & Farrell, 2005) which in turn influences the selection of objectives, materials, activities and assessment (Buczynski & Hansen, 2010; Woolfolk, Davis, & Pape, 2006). Decision-making functions as a mediator through which structured learning and teaching take place.

While previous research has identified links among professional development activities, teaching beliefs, teacher efficacy, and teaching behaviors (Buczynski & Hansen, 2010; Sheu, 2019; Zheng, 2009), the dynamic, non-linear interactions among these elements and decision-making have been less explored (Kennedy, 2005; Smith, 2010). This study intends to fill this gap by answering:

1. Do professional development activities positively affect teaching beliefs, teacher efficacy, and decision-making among EFL teachers?
2. Do teaching beliefs and teacher efficacy positively affect decision-making among EFL teachers?
3. Does teacher decision-making positively influence on teaching behaviors?
4. After teaching, do teaching behaviors positively affect teaching beliefs, teacher efficacy, and decision making?

Accordingly, we propose the following model (Figure 1), which predicts the relationship among five factors: professional development activities (PDAs), teaching belief (TB), teacher efficacy (TE), decision making (DM), and teaching behaviors (TBH).

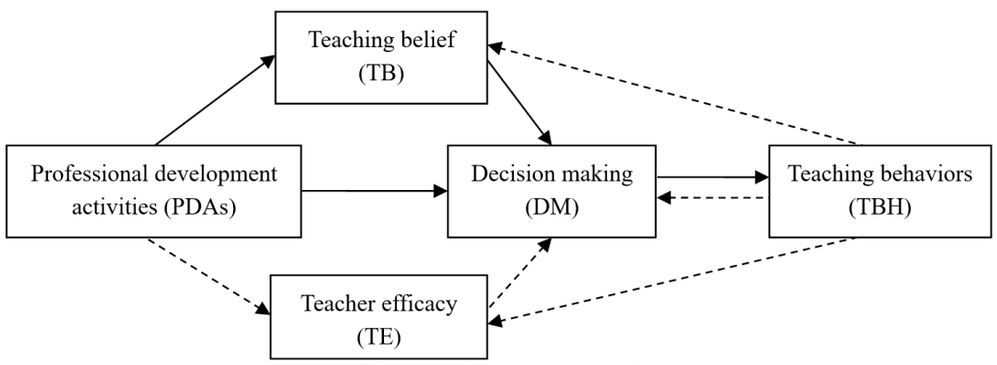

Figure 1. The proposed model.

Note: The solid lines indicate the direct effect relationships, while the dotted lines show the reflective ones.

2. Method

2.1. Research Subjects

This study adopted a stratified random sampling method. Taipei City consists of 12 administrative districts, and ten percent of the elementary schools in each district were selected. Then, based on the number of teachers in each selected school, a Google Form link for the questionnaire was sent to the participants (the number of participating schools and respondents is shown in Table 1).

A total of 222 English teachers from elementary schools in Taipei City, Taiwan, participated in this study. Among them, 57 were male and 165 were female. All participants had completed undergraduate studies with a major in either English language education or English literature. Of the total, 67 held bachelor's degrees, while 155 had obtained master's degrees. Their English proficiency was aligned with the B2 level (upper-intermediate) as defined by the CEFR scale.

Regarding their years of teaching, 57 had less than 5 years, 69 had 6 to 10 years, and 96 had more than 10 years of experience. Substitute teachers were excluded due to their limited teaching hours at elementary schools.

Table 1. Number of participating schools and respondents.

Area	District (Schools)	Number of participating schools	Number of respondents
East	Neihu (13)	3	20
	Nangang (7)	2	12
West	Zhongzheng (8)	2	13
	Wanhua (11)	2	20
South	Songshan (8)	2	14
	Daan (12)	3	32
	Xinyi (9)	2	17
	Wenshan (20)	4	18
North	Shilin (19)	4	24
	Beitou (15)	3	19
Central	Datong (9)	2	15
	Zhongshan (11)	2	18
Total		31	222

2.2. Research Instrument

Two revised Chinese versions of a teaching behavior questionnaire were used, adapting from Cayci (2011); Desimone (2009); Richards and Farrell (2005) and Sheu (2019). The first questionnaire included five sections: professional development activities (PDAs: 9 items), teaching beliefs (TB: 16 items), teaching efficacy (TE: 20 items), decision making (DM: 9 items), and teaching behaviors (TBH: 16 items), totaling 70 question items. The second questionnaire comprised the TB, TE, and DM sections from the first questionnaire, with 45 items in total.

Responses were measured using a Likert scale, with values ranging from strongly disagree (1 point) to strongly agree (4 points). A higher score reflected a greater degree of agreement with the statement. To ensure content validity, the questionnaires were reviewed by two elementary school English teachers, and revisions were made based on their feedback. Reliability estimates were: Cronbach's alpha (α) = 0.875 (APD = .897, TB = .857, TE = .903, DM = .886, and BH = .835). According to George and Mallery (2009) these values indicate good internal consistency.

Data were collected two weeks before and after the academic semester. First, a Google Form link for the questionnaire was sent to 246 English teachers, and 222 responses were completed online (response rate = 90.2%). The second questionnaire was sent to the same 222 teachers, and all completed it (100% response rate).

3. Results and Discussions

3.1. PDAs → TB

The effect of PDAs on TB is showed in Table 2, the R^2 value of PDAs is 18.0%. As shown in Table 3, the F value reveals a significance in this model, indicating PDAs can predict TB. Table 4 shows PDAs' contribution to this prediction (β=.424; Sig=.000). That is, an increase in teachers' engagement in PDAs tends to be associated with TB.

Table 2. Teaching beliefs' regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.424(a)	0.180	0.176	0.2378

Note: (a) Predictors (Constant): PDAs.

Table 3. Teaching beliefs' ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	2.723	1	2.723	48.156***	0.000
	Residual	12.442	220	0.057		
	Total	15.165	221			

Note: *** $p < 0.001$.

Table 4. Summary of teaching beliefs' findings.

Model		Non-standardized coefficients		Standardized coefficients	T	Collinearity statistics	
		B	Std. error	Beta		Tolerance	VIF
1	(Constant)	1.744	0.229		7.606***		
	PDAs	0.453	0.065	0.424	6.939***	1.000	1.000

Note: *** $p < 0.001$.

3.2. PDAs → TE

The R^2 value of PDAs in Table 4 is 1%. The result of ANOVA summary (F=.283, n.s.) in Table 5, and coefficient analysis (β=.036; n.s.) in Table 6 accounts for this model not significant, which suggests that PDAs are not related to TE.

Table 5. Teacher efficacy's regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.036[a]	0.001	-0.003	0.3086

Note: (a) Predictors (Constant): PDAs.

Table 6. Teaching efficacy's ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	0.027	1	0.027	0.283	0.595
	Residual	20.946	220	0.095		
	Total	20.973	221			

Table 7. Summary of teaching efficacy's findings.

Model		Non-standardized coefficients		Standardized coefficients	T	Collinearity statistics	
		B	Std. error	Beta		Tolerance	VIF
1	(Constant)	3.255	0.169		19.208***		
	PDAs	0.026	0.049	0.036	0.532	1.000	1.000

Note: *** $p < 0.001$.

3.3. PDA/TB/TE → DM

Table 7 manifests that the R^2 value of this model accounts for 60.8% of the predictors. Table 8 indicates that the ANOVA result of this model accounts significantly for DM (F=112.784, Sig=.000). In addition, the results in Table 9 demonstrate that PDAs (β=.532; Sig=.000), TB (β=-.205; Sig=.000), and TE (β=-.304; Sig=.000) can significantly predict DM.

Table 8. Decision-making's regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
3	0.780(a)	0.608	0.603	0.2660

Note: (a) Predictors (Constant): PDAs, TB, TE.

Table 9. Decision making's ANOVA summary.

Model		Sum of squares	df	Mean square	F	Sig.
3	Regression	23.947	3	7.982	112.784***	0.000
	Residual	15.429	218	.071		
	Total	39.377	221			

Note: *** $p < 0.001$.

Table 10. Summary of the decision-making findings.

Model		Non-standardized coefficients		Standardized coefficients	T	Collinearity statistics	
		B	Std. error	Beta		Tolerance	VIF
3	(Constant)	0.013	0.290		0.046		
	PDAs	0.574	0.062	0.532	9.313***	1.000	1.000
	TB	0.173	0.042	0.205	4.068***	0.704	1.420
	TE	-0.583	0.120	-0.304	-4.860***	0.820	1.219

Note: *** $p < 0.001$.

3.4. DM → TBH

In Table 10, the DM's regression result shows that the R^2 value is 2.83, presenting 28.3% of the prediction of this model. The ANOVA results in Table 11 is significant (F=86.737, Sig=.000), and the coefficient analysis in Table 12 indicates that TBH can be predicted significantly by DM (β=.532; Sig=.000). In other words, changes in DM result in changes in TBH.

Table 11. Teaching behaviors' regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.532[a]	0.283	0.280	0.3866

Note: (a) Predictors (Constant): DM.

Table 12. Teaching behaviors' ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	12.963	1	12.963	86.737***	0.000
	Residual	32.879	220	0.149		
	Total	45.842	221			

Note: *** $p < 0.001$.

Table 13. Summary of Teaching behaviors' findings.

Model		Non-standardized coefficients		Standardized coefficients	T	Collinearity statistics	
		B	Std. Error	Beta		Tolerance	VIF
1	(Constant)	0.947	0.212		4.459***		
	DM	1.225	0.128	0.598	9.544***	0.820	1.219

Note: *** $p < 0.001$.

3.5. TBH → TB

Table 13 displays the summary of the regression model for TBH, with an R^2 value of .296, indicating that TBH accounts for 29.6% of the variance in the dependent variable. As shown in Table 14, the ANOVA result (F = 45.950, p = 0.000) demonstrates that the model is significant, suggesting that changes in TBH have a meaningful impact on TB. When the beta values were examined in Table 15, TBH efficacy (β = -0.268; Sig = 0.000) contributes significantly to TB.

Table 14. Teaching beliefs' regression model summary.

Model	R	R square	Adjusted R-squared	Std. error of the estimate
1	0.544(a)	0.296	0.289	0.4232

Note: (a) Predictors (Constant): TBH.

Table 15. Teaching beliefs' ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	16.459	1	8.230	45.950***	0.000
	Residual	39.223	220	0.179		
	Total	55.682	221			

Note: *** $p < 0.001$.

Table 16. Summary of Teaching beliefs' findings.

Model		Non-standardized coefficients		Standardized coefficients	T	Collinearity statistics	
		B	Std. Error	Beta		Tolerance	VIF
1	(Constant)	.664	.459		1.448		
	TBH	-.432	.079	-.268	-5.437***	.741	1.350

Note: *** $p < 0.001$.

3.6. TBH → DM

Table 16 presents the regression model summary for TBH, showing an R^2 value of .296, which indicates that 29.6% of the TB's variance is explained by TBH. The ANOVA results in Table 17 reveal that the model is statistically significant (F = 61.440, p = 0.000), suggesting that TBH contributes meaningfully to predicting the

outcome variable; that is, changes in TBH would significantly cause changes in DM. Table 18, TBH (β=0.716; Sig=0.000) contributes significantly to DM.

Table 17. Decision making's regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.576(a)	0.332	0.330	0.3857

Note: (a) Predictors (Constant): TBH.

Table 18. Decision making's ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	16.528	1	5.509	61.440***	0.000
	Residual	28.156	220	0.090		
	Total	44.683	221			

Note: *** $p < 0.001$.

Table 19. Summary of Decision making's findings.

Model		Non-standardized coefficients		Standardized coefficients		Collinearity statistics	
		B	Std. error	Beta	T	Tolerance	VIF
2	(Constant)	0.826	0.338		2.986		
	TBH	1.235	0.043	0.716	13.552***	0.990	1.010

Note: *** $p < 0.001$.

3.7. TBH → TE

As shown in Table 20, the regression model summary for TBH after instruction yields an R^2 value of .003. It can be seen that no significance is found in both ANOVA summary (F=0.751, n.s.) in Table 21 and Coefficient analysis (β=0.058; n.s.) in Table 22; in other words, outcomes in TBH are unlikely to cause changes in TE after teaching.

Table 20. Teacher efficacy's regression model summary.

Model	R	R square	Adjusted R square	Std. error of the estimate
1	0.058(a)	0.003	-0.001	0.3071

Note: (a) Predictors (Constant): TBH.

Table 21. Teacher efficacy's ANOVA summary.

Model		Sum of square	df	Mean square	F	Sig.
1	Regression	0.071	1	0.071	0.751	0.387
	Residual	20.750	220	0.094		
	Total	20.821	221			

Table 22. Summary of Teacher efficacy's findings.

Model		Non-standardized coefficients		Standardized coefficients		Collinearity statistics	
		B	Std. error	Beta	T	Tolerance	VIF
1	(Constant)	3.229	0.169		19.149***		
	TBH	0.042	0.049	0.058	0.866	1.000	1.000

Note: *** $p < 0.001$.

3.8. Path Effects in the Non-Linear Structure

This study proposed two categories of hypothesized effects (see Figure 1) to elucidate the relationships among five factors:

The first involved direct influences: professional development activities (PDAs) were expected to have a positive effect on teaching behaviors (TB) and decision-making (DM); TB was anticipated to influence DM; and DM was expected to contribute to the development of teaching beliefs and habits (TBH).

The second category concerned reflective effects, comprising five reciprocal pathways: PDAs influencing teaching efficacy (TE); TE affecting DM; TBH impacting both DM and TB; and TBH contributing to TE. Nonetheless, empirical findings partially diverged from these expectations.

Figure 2 illustrates the structural model, including the path coefficients and their corresponding levels of statistical significance. Notably, some reflective results contradicted our assumptions: PDAs had no reflective effect on TE, and TBH did not reflect on TE after teaching. Key findings are summarized as follows:

Prior to teaching, professional development activities (PDAs) were found to be significant positive predictors of teaching behaviors (TB), teaching efficacy (TE), and decision-making (DM). In addition, both TB and TE independently exerted a positive influence on DM, suggesting a coherent forward linkage among these constructs before instruction took place.

After teaching, the relationship between DM and teaching beliefs and habits (TBH) was not statistically significant, indicating that decision-making did not directly translate into long-term teaching dispositions. In contrast, both TB and TE were positively associated with TBH, yet unexpectedly showed negative associations with DM. Furthermore, TBH demonstrated a reciprocal influence on TB and DM, but did not exhibit a reflective effect on TE.

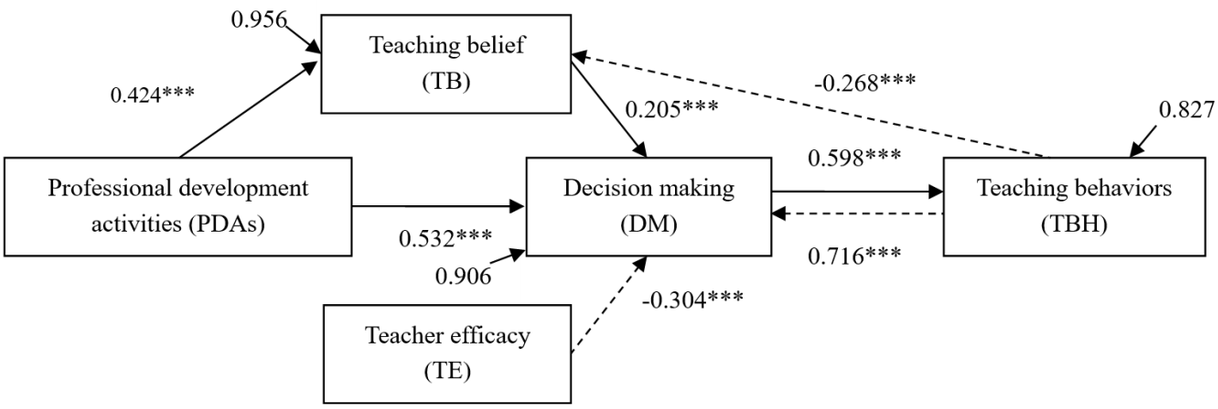

Figure 2. Path analysis and standardized coefficients.

Note: The solid lines indicate the direct effect relationships, while the dotted lines show the reflective ones, *** $p < 0.001$.

4. Discussion and Conclusion

This study investigated Taiwanese elementary teachers' perceptions of professional development activities (PDAs), teaching beliefs (TB), efficacy (TE), decision-making (DM), and behaviors (TBH), as well as the relationships among these factors. The findings confirm some results reported in previous studies while offering new insights that reflect the teaching context and the characteristics of the participant group.

One notable finding is that PDAs had a significant positive impact on teachers' beliefs and decision-making processes. Teachers who value PDAs, such as workshops, seminars, and observations, reported stronger intentions and willingness to improve their pedagogical knowledge and greater clarity when making instructional decisions. This is consistent with earlier research suggesting that structured PDAs enhance teachers' professional identity and encourage teachers to question, affirm, or revise their instructional conceptions (Desimone, 2009; Jasper, 2006; Opfer & Pedder, 2011; Smith, 2010; Stewart, 2014). The present study also confirms that PDAs can serve as cognitive stimulants, enabling teachers to integrate new pedagogical information into their beliefs and apply it to their classroom planning and practices.

However, the study also found that PDAs had a limited influence on teacher efficacy. Although participation in professional learning led to refined instructional strategies and deeper reflection, it did not significantly alter teachers' perceptions of their teaching competence. This finding contrasts with studies that have reported positive associations between targeted professional development and increased teacher efficacy (Levin & Wadmany, 2006; Morris et al., 2017), particularly when PDAs are sustained, relevant, and embedded in practice (Tschannen-Moran & McMaster, 2009). A possible explanation for this discrepancy may lie in the participants' teaching experiences. Most teachers in the current study had substantial teaching hours, and their sense of efficacy may have been well-established, leaving little room for noticeable change. In such cases, PDAs may affirm rather than establish their confidence, which aligns with findings by Klassen et al. (2011) who observed that teacher efficacy tends to stabilize with increased experience.

Instead of significantly influencing TE, PDAs in this study appeared to reinforce reflective decision-making. Participants indicated that PDAs encouraged them to revisit their teaching perceptions and reassess instructional plans and decisions. This supports the view that professional development contributes more to cognitive engagement and pedagogical awareness than to shifting one's instructional competence (Avalos, 2011). The cyclical nature of this reflection, stimulated by external input (PDAs) and internalized through planning and practice, fosters appropriate decision-making processes that are responsive to teaching situations.

Decision making emerges as a central mediator in the relationship between beliefs, efficacy, and behaviors. Teachers reported that their planning and instructional decisions are directly influenced by both their professional beliefs and their perceived capacity to manage classroom practice. This finding aligns with previous research emphasizing the importance of teacher cognition in shaping instructional practice (Buczynski & Hansen, 2010; Fives & Buehl, 2012). The current study extends these findings by demonstrating that not only do beliefs influence decisions, but decisions also reinforce beliefs through practice, indicating a reciprocal system rather than a linear progression.

Furthermore, a reciprocal relationship between DM and TBH was observed. Teachers' classroom actions were often the result of prior decisions, yet experiences during instruction prompted revisions in subsequent planning. This supports the concept of teaching as a reflective process, consistent with Clarke and Hollingsworth's (2002) Interconnected Model of Professional Growth, in which change occurs through interactions among different domains of teacher professional development. However, in contrast to some studies that emphasized the emotional dimension of teaching behaviors (Skaalvik & Skaalvik, 2010), the participants in this study reported a more instrumental approach, focusing primarily on instructional content, materials, and activities, possibly reflecting the exam-oriented and curriculum-driven nature of EFL teaching in Taiwan.

Lastly, post-instruction reflections revealed that teachers generally viewed their teaching behaviors positively and reaffirmed their pre-existing beliefs. However, no significant changes were observed in their sense of efficacy. This finding implies that teachers' confidence in their instructional abilities is largely shaped during the planning phase and remains relatively stable, even when confronted with the dynamic nature of classroom experiences (Tschannen-Moran & McMaster, 2009).

In conclusion, this study contributes to a nuanced understanding of how professional development activities (PDAs) influence Taiwanese elementary school teachers' beliefs, efficacy, decision-making, and instructional behaviors. The findings underscore the value of PDAs for reflective engagement and pedagogical refinement, particularly in enhancing teaching beliefs and decision-making processes. While teacher efficacy appeared relatively stable and resistant to short-term changes, the data suggest that decision-making emerged as a pivotal construct, mediating the interactions among belief, efficacy, and behavior, and reinforcing the notion of teaching as a reflective and iterative process. Moreover, the reciprocal influence between planning and classroom action highlights the complex and evolving nature of instructional decision-making within real-world teaching situations.

These insights emphasize the importance of sustained, context-sensitive professional development that not only considers teachers' professional needs, interests, and practical school-related considerations but also equips teachers with new strategies and fosters critical reflection, thereby supporting long-term professional growth in exam-driven educational settings.

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