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Understanding Reflective Practice through Reflective Levels and Training Pathway Characteristics

Rui Xu
School of Education, Faculty of Social Sciences and Leisure Management (FSLM), Taylor's University, Malaysia, *rui.xu@sd.taylors.edu.my*

Pauline Swee Choo Goh
Assoc. Prof., School of Education, Faculty of Social Sciences and Leisure Management (FSLM), Taylor's University, Malaysia, *Pauline.Goh@taylors.edu.my*

Hashimah Mohd Yunus
Assoc. Prof., School of Education, Faculty of Social Sciences and Leisure Management (FSLM), Taylor's University, Malaysia, *Hashimah.MohdYunus@taylors.edu.my*

Reflective practice is widely recognized as a fundamental aspect of teacher development, but its practical implementation often poses challenges for pre-service teachers. Although essential for professional growth, the depth and nature of reflective practice vary considerably among pre-service teachers. This study investigates the reflective practices of Chinese pre-service teachers during their education internships, examining how training pathway characteristics-qualification, teaching grade level, teaching experience, and teaching certification-influence their levels of reflective practice. Grounded in Larrivee's (2008) framework, this quantitative study surveyed 198 pre-service teachers using a validated instrument for measuring levels of reflective practice. The findings reveal notable patterns: pre-service teachers most frequently engage in critical and pedagogical reflection, while surface and pre-reflection levels are comparatively less common. Specifically, qualification is associated with deeper levels of reflection; teaching grade level affects pre-reflection and surface reflection; and teaching experience significantly shapes critical reflection. Additionally, obtaining a teaching certification is linked to heightened pre-reflection and surface reflection. These results underscore the complexity of reflective practice and its interaction with pre-service teachers' training pathway characteristics. The study offers insights for teacher educators seeking to understand reflective practice and to design targeted interventions that foster reflective capacity. By clarifying the relationship between levels of reflection and training pathway characteristics, this research contributes to the advancement of teacher preparation in the Chinese context.

Keywords: reflective practice, pre-service teachers, levels of reflection, training pathway characteristics, teacher education

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INTRODUCTION

Reflective practice is no longer a novel concept, yet its implementation remains a challenge in many educational contexts. In China, the rapid demand for teachers has led to a swift transition of pre-service teachers into full-time roles. However, studies suggest that many of these teachers revert to traditional teaching methods learned during their schooling, rather than adopting innovative strategies (Wang, 2021). As Farrell (2018) once asserted, every "underprepared" teacher has the potential to improve through reflection. Although China's teacher education system emphasizes reflection, its practical application remains limited. This raises a critical question: How can pre-service teachers be better supported to develop reflective practices that enhance their professional growth and teaching effectiveness?

Reflective practice is often regarded as a hallmark of teacher professionalism. Rooted in the foundational works of Dewey (1933) and Schön (1983, 1987), reflective practice has evolved into a cornerstone of professional development for both in-service and pre-service teachers. It bridges the gap between theory and practice, enabling teachers to critically evaluate their teaching behaviors and improve their pedagogical decisions (Cirocki & Widodo, 2019; Farrell, 2018). For pre-service teachers, reflection is particularly crucial during internships, where they confront real-world classroom challenges and begin to shape their teaching identities (Suphasri & Chinokul, 2021). By engaging in reflective practice, pre-service teachers can identify strengths and weaknesses in their teaching, justify their pedagogical choices, and ultimately develop into more effective educators (Rozlan, 2022; Azimi et al., 2019). As Dumlao and Pinatacan (2019) highlight, reflective practices such as journal writing can enhance the professional development of pre-service teachers by encouraging deeper engagement with classroom experiences and self-evaluation.

Despite its recognized value, the reality is far more complex, the extent to which future teachers engage in meaningful reflection remains questionable. Studies suggest that many pre-service teachers engage in reflective practice at a superficial level, often reducing it to a routine task rather than a transformative learning process (Rozlan, 2022). In China, for instance, the reflective practice component of pre-service teacher education is often underdeveloped, leaving many teachers ill-equipped to engage in meaningful self-examination (Zhan, 2018). While China’s teacher education policies have sought to address this gap, emphasizing reflective practice as a key element of professional development through documents. However, many pre-service teachers struggle to move beyond superficial descriptions of their teaching experiences (Huang, 2020; Chen & Zhou, 2022). Therefore, despite these policies, questions persist about whether pre-service teachers truly engage in reflective practice in a way that enhances their professional growth.

This gap between policy and practice highlights a critical need for empirical research on how pre-service teachers in China engage in reflective practice and what factors influence their reflective abilities. While studies in Western contexts have explored reflective practices extensively, the unique cultural and educational landscape of China necessitates a deeper understanding of this issue (Mo, 2020; Le, 2018). Existing

research often focuses on in-service teachers, whose reflective practices tend to be superficial and descriptive (Ji, 2020; Wang, 2021). Similar limitations are not unique to the Chinese context. For example, Hung and Thuy (2021) found that although Vietnamese EFL teachers acknowledged the value of reflective teaching, their actual reflective practices remained largely superficial and lacked critical depth. However, as Huang (2018) argues, addressing reflective practice during the pre-service stage is crucial, as it lays the foundation for lifelong professional growth. Pazhoman and Sarkhosh (2019) demonstrated that teaching experience and self-regulation were strongly associated with higher levels of reflective engagement among EFL teachers, underscoring the importance of examining such variables in teacher education. Moreover, while some studies suggest that training pathway characteristics, such as qualification, teaching grade level, and certification, may influence reflective practice (Huang, 2018; Zhao, 2022), there is a lack of empirical evidence to support these claims.

This study seeks to address these gaps by examining the levels of reflective practice among Chinese pre-service teachers during their education internships and exploring the role of training pathway characteristics in shaping their reflective practices. Using Larrivee's (2008) framework, which identifies four levels of reflection: pre-reflection, surface reflection, pedagogical reflection, and critical reflection, this study aims to provide a nuanced understanding of how pre-service teachers in China reflect on their teaching experiences. By doing so, it hopes to offer empirical evidence to inform targeted interventions that enhance reflective practice, ultimately contributing to the professional growth and teaching effectiveness of pre-service teachers in China.

Key Levels in Reflective Practice

Numerous studies have highlighted a recurring challenge in teacher education: many pre-service teachers tend to engage in only superficial reflection, often limiting their reflections to descriptive accounts of their teaching experiences (Rozlan & Harun, 2022; Mirzaei et al., 2020; Min et al., 2017). Scholars have proposed various theoretical frameworks to categorize levels of reflection in teaching and learning (Van Manen, 1977; Larrivee, 2008). One of the most widely cited models is Van Manen's (1977) levels of reflection, which classifies teacher reflection into three distinct stages: technical reflection (a basic level focused on efficiency and methods), practical reflection (which considers broader teaching principles and student learning), and critical reflection (which examines the ethical and moral dimensions of teaching). Research suggests that teachers who engage in shallow reflection tend to remain at the technical level, where their focus is primarily on instructional strategies rather than deeper pedagogical or ethical considerations (Wang, 2019; Li, 2021).

Larrivee (2008) built upon Van Manen's (1977) theory of levels of reflection and established four distinct levels of reflection: pre-reflection, surface reflection, pedagogical reflection, and critical reflection. Larrivee (2008) explained that at the 'pre-reflective' level, teachers reacted to students and classroom situations automatically, without considering alternative responses, while at the 'surface reflection' level, their reflections tended to focus on strategies and methods to reach predetermined teaching

goals. At the 'surface' level, teachers were still 'feeling their way', and thus, values, beliefs, and assumptions were not a concern to them. However, at the 'pedagogical reflection' level, teachers began to reflect on educational goals, the theories underlying approaches, and the connections between theoretical principles and practice. Ultimately, at the 'critical reflection' level, teachers began to reflect on the moral and ethical implications and consequences of their classroom practices on students.

Based on these levels of reflective practice framework, critical reflection is regarded as the highest level of reflection for educators. However, for most teachers, achieving the status of a critical reflection teacher can be quite challenging, more so for pre-service teachers during their internship (Dong, 2022). Fan (2018) analyzed student teachers' reflective journals and learned that most of them were at the level of descriptive reflection and lacked the element of personal reflection. Zhao (2018) found that the reflective practices demonstrated by student teachers in their teaching were at the lowest level of reflection, focusing mainly on the effectiveness of various skills and techniques in the classroom context. Dong (2022) found that of student teachers' reflective journals, only 20% reached the reflective level, and the rest were descriptive pieces. These findings collectively highlight that while reflective practice is emphasized in teacher education, there remains a significant gap between the intended goal of critical reflection and the actual reflective abilities demonstrated by pre-service teachers.

Training Pathway Characteristics

While reflection is often assumed to improve with experience, the relationship between teaching experience and reflective depth remains a subject of debate. Many studies suggest a positive correlation, with more experienced teachers demonstrating higher levels of reflective practice (Ansarin et al., 2015; Rezaee & Seyri, 2021). However, other research offers a more nuanced perspective. Gheith and Aljaberi (2018), for example, found no statistically significant differences in reflective practice levels based on years of experience or participation in professional development workshops. This suggests that experience alone may not guarantee deeper reflection and that other factors, such as the quality of professional learning opportunities, may play a crucial role.

Beyond experience, scholars have examined the influence of qualification on teachers' reflective practice. Soodmand Afshar and Farahani (2018) explored the impact of both teaching experience and qualification on reflective engagement among Iranian EFL teachers, concluding that both factors were positively correlated with perceptions of reflective teaching. However, teacher qualification extends beyond university degrees. In China, obtaining a teaching certificate can also shape reflective practices. Huang (2018) found that pre-service teachers who acquired China's teacher qualification certificate during their internships demonstrated distinct differences in their reflective writing. This certification, which assesses candidates' ability to integrate theory with practice, may encourage deeper engagement with reflection (Zhao, 2022).

Another key variable influencing reflective practice is the grade level at which teachers instruct. Liu (2023) surveyed 138 secondary school English intern teachers and found significant differences in reflection levels depending on the grade being taught. For

instance, pre-service teachers working with seventh and eighth graders exhibited notable disparities in their critical reflection abilities, while those teaching high school students demonstrated significant variations in cognitive, emotional, and moral reflection. Similarly, Pan (2019) noted that teachers instructing lower grades tended to engage in deeper reflective practices compared to those teaching higher grades. This suggests that teaching younger students, who often require more adaptive and student-centered pedagogical approaches, may prompt greater reflection on instructional methods and student engagement.

Despite growing research on teacher reflection, a notable gap remains in understanding how training pathway characteristics interact to shape reflective practices, particularly among primary pre-service teachers in China. Ming (2021) and Lang (2020) emphasize the need for further empirical investigations into how qualification, teaching experience, grade level, and certification influence reflective engagement. Addressing this gap would provide deeper insights into the complex interplay of factors shaping pre-service teachers' ability to engage in meaningful, critical reflection.

Research Questions and Hypothesis

The primary aim of this study is to examine the levels of reflective practice among Chinese pre-service teachers during their education internships, based on Larrivee's (2008) four-level reflective framework. A secondary aim is to investigate how specific training pathway characteristics, qualification, teaching grade level, teaching experience, and teaching certification influence engagement at different levels of reflection. In line with these aims, the following research questions were formulated:

RQ1: What are the prevailing levels of reflective practice (i.e., pre-reflection, surface reflection, pedagogical reflection, and critical reflection) among Chinese pre-service teachers during their education internships?
RQ2: How do training pathway characteristics (i.e., qualification, teaching grade level, teaching experience, and teaching certification) influence pre-service teachers' engagement in each level of reflective practice?

Based on the above research questions, the study proposed the following hypotheses:
H1: There are significant differences in the mean scores across the four levels of reflection among Chinese pre-service teachers.
H2: Each of the training pathway characteristics significantly affects one or more levels of reflection among Chinese pre-service teachers.

METHOD

Participants

This study involved 198 pre-service teachers majoring in Primary Education who were undergoing their teaching internship in Nanchang City, Jiangxi Province, China, from September 2023 to February 2024.

Instruments

This study employed Larrivee's (2008) 'Survey of Reflective Practice: A Tool for Assessing Development as a Reflective Practitioner', which assesses teachers' development across four levels of reflection: pre-reflection, surface reflection, pedagogical reflection, and critical reflection. The original 53-item English version was translated into Chinese and subjected to exploratory factor analysis (EFA) to validate its structure in the local context (DeVellis, 2017; Tabachnick & Fidell, 2019).

EFA supported a four-factor structure consistent with the original model, with minor adjustments: two items were reassigned, and six were removed due to low or cross-loadings. The final version included 46 items across four subscales: pre-reflection (9 items), surface reflection (11), pedagogical reflection (13), and critical reflection (13). Reliability analysis demonstrated strong internal consistency (Cronbach's $\alpha = 0.919$).

Data Analysis

A Multivariate Analysis of Variance (MANOVA) was conducted to compare the mean scores of pre-reflections, surface reflection, pedagogical reflection, and critical reflection, as well as to examine the factors influencing these levels of reflective practice.

Levels of reflection among Chinese pre-service teachers

A comparison of the four levels of reflection (Table 1) shows that Chinese pre-service teachers engaged in critical reflection (M=2.975) slightly more frequently than pedagogical reflection (M=2.964). They also exhibited pre-reflection (M=2.845) more than surface reflection (M=2.808). These results suggest that Chinese pre-service teachers primarily operate at the level of critical reflection, followed by pedagogical reflection, pre-reflection, and surface reflection. This pattern implies that deeper levels of reflection (critical and pedagogical) are more prevalent than surface-level reflection.

Table 1
Descriptive statistics for reflection levels

			95% Confidence Interval	
Reflection	Mean	Std. Error	Lower	Upper
Pre-	2.845	.0393	2.767	2.921
Surface	2.808	.0335	2.740	2.871
Pedagogical	2.964	.0312	2.899	3.020
Critical	2.975	.0286	2.919	3.030

A multivariate analysis of variance was used to compare those means (Table 2). The MANOVA results ($F(4, 163) = 2137.077$, $p < .001$, partial$\eta^2 = .981$) indicate a statistically significant difference among the four levels of reflection.

Table 2
multivariate tests for reflection levels

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Pillai's Trace	.981	2137.077	4.000	163.000	.000	.981
Wilks' Lambda	.019	2137.077	4.000	163.000	.000	.981
Hotelling's Trace	52.444	2137.077	4.000	163.000	.000	.981
Roy's Largest Root	52.444	2137.077	4.000	163.000	.000	.981

These findings support Hypothesis 1 (H1), which proposed significant differences among pre-reflection, surface reflection, pedagogical reflection, and critical reflection levels among Chinese pre-service teachers.

Pre-service Teachers' training pathway characteristics and their levels of reflective practice

Table 3 presents the SPSS output of multivariate analysis. The analysis also includes post-hoc comparisons for teaching grade level and teaching experience, as these variables contain multiple levels. An Independent Samples T-test was used to examine the effects of qualification and teaching certification on the levels of reflective practice, as these variables consist of two categories. The findings will be further analyzed in the following sections, focusing on how qualification, teaching grade level, teaching experience, and certification status influence various dimensions of reflective practices.

Table 3
Tests of between subjects effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Academic background	Pre	.080	1	.080	.326	.569	.002
	Surface	.028	1	.028	.147	.702	.001
	Pedagogical	1.386	1	1.386	8.641	.004	.049
	Critical	.570	1	.570	5.314	.022	.031
Teaching grade level	Pre	3.320	2	1.660	6.740	.002	.075
	Surface	1.397	2	.699	3.633	.029	.042
	Pedagogical	.432	2	.216	1.348	.262	.016
	Critical	.521	2	.261	2.429	.091	.028
Teaching experiences	Pre	.183	2	.092	.372	.690	.004
	Surface	.351	2	.176	.913	.403	.011
	Pedagogical	.878	2	.439	2.737	.068	.032
	Critical	1.761	2	.881	8.206	.000	.090
Teaching certification	Pre	3.076	1	3.076	12.492	.001	.070
	Surface	.951	1	.951	4.948	.027	.029
	Pedagogical	.028	1	.028	.174	.677	.001
	Critical	.075	1	.075	.700	.404	.004

Reflection and qualification

Among the independent variables, qualification had a statistically significant effect on pedagogical reflection (F=8.641, p=.004, η^2=.049) and critical reflection (F=5.314,

p=.022, η^2=.031), indicating that pre-service teachers with different qualifications exhibit meaningful differences in deeper levels of reflection. However, its influence on pre-reflection (p=.569) and surface reflection (p=.702) was negligible.

Table 4 presents descriptive statistics for pedagogical and critical reflection across different qualifications. The results show that pre-service teachers with high school diplomas scored higher in both pedagogical reflection (M = 3.179, SD = 0.446) and critical reflection (M = 3.148, SD = 0.431) compared to those with vocational diplomas (pedagogical reflection: M = 2.780, SD = 0.380; critical reflection: M = 2.828, SD = 0.316).

Table 4
Descriptive statistics: levels of reflection by qualification

			Std.	Std.	95% Confidence Interval	
		Mean	Deviation	Error	Lower Bound	Upper Bound
Pedagogical	High school diploma	3.179	.446	.047	3.086	3.272
	Vocational diploma	2.780	.380	.037	2.707	2.853
Critical	High school diploma	3.148	.431	.045	3.058	3.238
	Vocational diploma	2.828	.316	.031	2.768	2.889

In Table 5, an independent samples t-test (with Welch's correction) revealed that qualification significantly affected pedagogical reflection (t (177.92) = 6.72, p < .001, Mean Difference = 0.399, 95% CI [0.282, 0.516]). Therefore, pre-service teachers with high school diplomas (M = 3.179, SD = 0.446) scored significantly higher than those with vocational diplomas (M = 2.780, SD = 0.380).

For critical reflection, a significant difference was also observed (t (162.23) = 5.87, p < .001, Mean Difference = 0.320, 95% CI [0.212, 0.427]). Again, pre-service teachers with high school diplomas (M = 3.148, SD = 0.431) outperformed those with vocational diplomas (M = 2.828, SD = 0.316).

Table 5
Independent samples test: Pedagogical and critical by qualification

						95% CI	
	t	df	p-value	Mean Diff.	Std. Error	Lower	Upper
Pedagogical	6.72	177.92	.000	.399	.0594	.282	.516
Critical	5.87	162.23	.000	.320	.0545	.212	.427

These results indicate that pre-service teachers with high school diplomas demonstrated higher levels of both pedagogical and critical reflection compared to their counterparts with a vocational diploma.

Reflection and teaching grade level

As shown in Table 3, teaching grade level showed significant effects on pre-reflection

(F=6.740, p=.002, η^2=.075) and surface reflection (F=3.633, p=.029, η^2=.042), suggesting that the grade level pre-service teachers taught impacts lower-order reflection. No significant effects were found for pedagogical reflection (p=.262) or critical reflection (p=.091).

Additionally, Table 6 presents the descriptive statistics for pre-reflection and surface reflection across different teaching grade levels. The results show that pre-service teachers teaching intermediate grades scored the highest in pre-reflection (M = 2.976, SD = 0.419), followed by those teaching upper grades (M = 2.768, SD = 0.615) and lower grades (M = 2.745, SD = 0.624). For surface reflection, pre-service teachers teaching upper grades had the highest scores (M = 2.920, SD = 0.522), followed by intermediate grades (M = 2.860, SD = 0.370) and lower grades (M = 2.706, SD = 0.509).

Table 6
Descriptive statistics: Levels of reflection by teaching grade level

			Std.		95% Confidence Interval	
		Mean	Deviation	Std. Error	Lower Bound	Upper Bound
Pre	Lower	2.745	.624	.069	2.607	2.883
	Intermediate	2.976	.419	.046	2.884	3.068
	Upper	2.768	.615	.104	2.557	2.979
Surface	Lower	2.706	.509	.057	2.594	2.818
	Intermediate	2.860	.370	.041	2.779	2.942
	Upper	2.920	.522	.088	2.740	3.099

The results of the post-hoc comparison test (Table 7) indicate that for pre-reflection, pre-service teachers teaching intermediate grades (M=2.976) scored significantly higher than those teaching lower grades (MD = 0.231, p = .014, 95% CI [0.039, 0.423]). No significant differences were found between teachers of upper grades and those teaching lower or intermediate grades in pre-reflection scores (p > .05).

For surface reflection, while overall ANOVA results indicated a significant difference (F=3.633, p=.029), the post-hoc comparisons revealed marginal differences that approached significance but did not reach the .05 threshold. Specifically, pre-service teachers teaching upper grades (M = 2.920) tended to have higher surface reflection scores compared to those teaching lower grades (MD = 0.214, p = .058, 95% CI [-0.006, 0.433]), and intermediate grade (MD = 0.059, p = .8, 95% CI [-0.16, 0.278]). and intermediate grades (M = 2.860) showed a similar trend when compared to lower grades (MD = 0.154, p = .083, 95% CI [-0.015, 0.324]). These findings suggest a tendency for pre-service teachers working with higher grade levels to engage in slightly deeper surface reflection, though these differences were not statistically significant at the .05 level.

Table 7
Post hoc Scheffe's multiple comparisons by teaching grade level

Dependent Variable	(I)teaching grade level	(J) teaching grade level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Pre	Intermediate	Lower	.231*	.078	.014	.039	.423
		Upper	.207	.100	.121	-.040	.455
	Upper	Lower	.023	.100	.973	-.225	.271
Surface	Intermediate	Lower	.154	.069	.083	-.015	.324
	Upper	Lower	.214	.089	.058	-.006	.433
		Intermediate	.059	.089	.800	-.160	.278

*. The mean difference is significant at the .05 level.

Overall, the results suggest that teaching intermediate grades promotes more engagement in pre-reflection, while surface reflection tends to increase as the teaching grade level rises.

Reflection and teaching experience

Teaching experience had a statistically significant effect on critical reflection ($F = 8.206$, $p < .001$, $\eta^2 = .090$), indicating that more experienced teachers engage in deeper critical reflection (shown in Table 3). Although the effects of pedagogical reflection approached significance ($p = .068$), its impact on pre-reflection ($p = .690$) and surface reflection ($p = .403$) was not significant (shown in Table 3).

As shown in Table 8, pre-service teachers with more than 3 months of teaching experience had the highest critical reflection scores ($M = 3.291$), followed by those with no more than 3 months of experience ($M = 3.033$), and those with no teaching experience ($M = 2.838$).

Table 8
Descriptive statistics: Levels of reflection by teaching experience

		Mean	Std. Deviation	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Critical	Never	2.838	.333	.031	2.776	2.900
	No more than 3 months	3.033	.333	.050	2.932	3.135
	More than 3 months	3.291	.467	.073	3.144	3.438

The results of the post-hoc Scheffe tests are presented in Table 9. For critical reflection, pre-service teachers with more than 3 months of experience scored significantly higher than those with no experience ($MD = 0.453$, $p < .001$, 95% CI [0.305, 0.600]) and those with no more than 3 months of experience ($MD = 0.258$, $p = .002$, 95% CI [0.082, 0.433]). Additionally, pre-service teachers with no more than 3 months of experience scored significantly higher than those with no experience ($MD = 0.195$, $p = .004$, 95% CI [0.052, 0.339]). These findings suggest that even limited teaching experience (no more than 3 months) can enhance critical reflection, but extended experience (more than 3 months) leads to a more substantial improvement.

Table 9
Post hoc Scheffe's multiple comparisons by teaching experience

Dependent Variable	(I)teaching grade level	(J) teaching grade level	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Critical	No more than 3 months	Never	.195*	.058	.004	.052	.339
	More than 3 months	Never	.453*	.060	.000	.305	.600
		No more than 3 months	.258*	.071	.002	.082	.433

*. The mean difference is significant at the .05 level.

These findings suggest that even limited teaching experience (no more than 3 months) can enhance critical reflection, but extended experience (more than 3 months) leads to a more substantial improvement.

Reflection and teaching certification

Teaching certification significantly affected pre-reflection ($F = 12.492$, $p = .001$, $\eta^2 = .070$) and surface reflection ($F = 4.948$, $p = .027$, $\eta^2 = .029$), suggesting that certified teachers engage more in basic levels of reflection (shown in Table 3). However, it did not significantly influence pedagogical reflection ($p = .677$) or critical reflection ($p = .404$).

As shown in Table 10, certified teachers had higher pre-reflection scores ($M = 2.949$, $SD = 0.488$) compared to non-certified teachers ($M = 2.617$, $SD = 0.624$). Similarly, for surface reflection, certified teachers reported slightly higher scores ($M = 2.844$, $SD = 0.434$) than non-certified teachers ($M = 2.729$, $SD = 0.520$).

Table 10
Descriptive statistics: Levels of reflection by teaching certification

		Mean	Std. Deviation	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
Pre	Do have certification	2.949	.488	.042	2.866	3.031
	Do not have certification	2.617	.624	.079	2.458	2.775
Surface	Do have certification	2.844	.434	.037	2.770	2.917
	Do not have certification	2.729	.520	.066	2.597	2.861

As shown in Table 11, an independent samples t-test (with Welch's correction) was conducted to examine the effect of teaching certification on pre-reflection and surface reflection levels. For pre-reflection, the results revealed a significant difference between certified and non-certified teachers ($t (96.471) = 3.71$, $p < .001$, Mean Difference = 0.332, 95% CI [0.154, 0.510]). Certified teachers ($M = 2.949$, $SD = 0.488$) scored significantly higher than non-certified teachers ($M = 2.617$, $SD = 0.624$), indicating that certified teachers are more engaged in pre-reflective practices.

In contrast, for surface reflection, no significant difference was found ($t (101.28) = 1.51$,

p = .133, Mean Difference = 0.115, 95% CI [-0.036, 0.265]). Although certified teachers (M = 2.844, SD = 0.4343) reported slightly higher surface reflection scores than non-certified teachers (M = 2.729, SD = 0.5204), the difference did not reach statistical significance.

Table 11
Independent samples test: Pedagogical and critical by teaching certification

	t	df	p-value	Mean Diff.	Std. Error	95% CI Lower	95% CI Upper
Pre	3.706	96.471	.000	.332	.090	.154	.510
Surface	1.514	101.275	.133	.115	.076	-.036	.265

These results suggest that teaching certification significantly influences pre-reflection but has a limited impact on surface reflection. Certified teachers are more likely to engage in the initial stages of reflective practice but do not necessarily demonstrate higher levels of surface-level analysis compared to their non-certified counterparts.

Overall, these findings support Hypothesis 2 (H2), which proposed that each of the training pathway characteristics (i.e., qualification, teaching grade level, teaching experience, and teaching certification) significantly affects one or more levels of reflection among Chinese pre-service teachers.

DISCUSSION

The findings indicate that pre-service teachers exhibit varied levels of reflection, with a clear tendency toward pedagogical and critical reflection. This contrasts with earlier studies (Alsuhaibani, 2019; Dong, 2022; Fan, 2018; Zhao, 2019), which reported that most student teachers remained at descriptive or technical levels, consistent with the lower tiers in Van Manen's (1977) and Larrivee's (2008) frameworks. One possible explanation lies in methodological differences. While prior research often relied on qualitative data such as reflective journals, which may reveal only surface-level insights due to self-reporting limitations or lack of structure, the present study used Larrivee's (2008) validated scale to quantitatively assess self-perceived reflection across multiple dimensions. This structured approach may have enabled the identification of deeper levels of reflection, particularly critical reflection. The relatively high engagement in critical reflection suggests that many pre-service teachers are beginning to question assumptions and consider broader socio-cultural dimensions of teaching, reflecting the transformative learning process, an outcome rarely reported in earlier literature.

Among the training pathway characteristics, qualification had a significant effect on pedagogical and critical reflection. Pre-service teachers with high school diplomas outperformed those with vocational diplomas, echoing findings by Zhao (2022) and Soodmand Afshar and Farahani (2018), who emphasized the role of academic background and formal education in enhancing reflective capacity. This disparity may be due to differences in educational pathways. High school diploma holders typically enter undergraduate programs through the Gaokao and receive three years of systematic professional training before internships. In contrast, vocational-track students, though also Gaokao participants, are placed into vocational programs based on scores,

completing a three-year practice-focused diploma before advancing via a separate exam. Their more skills-oriented and less theory-intensive training may hinder engagement in deeper reflection (Huang, 2018). These results underscore the importance of targeted support in teacher education programs to strengthen the reflective capacity of students from diverse academic backgrounds.

The effect of teaching grade level was most pronounced at the pre-reflection level, this suggests that the complexity of teaching contexts might shape how deeply pre-service teachers engage in reflection. This supports Liu's (2023) and Pan's (2019) findings, which indicated that the age and developmental stage of students can influence how teachers reflect. Teachers working with intermediate-grade students may encounter more complex classroom dynamics and need to adapt instruction more frequently, which in turn may provoke deeper reflection.

Teaching experience had a significant positive effect on critical reflection, confirming previous claims that practical experience enhances the depth of teacher reflection (Ansarin et al., 2015). Furthermore, critical reflection demonstrated a consistent trend: the longer the teaching experience, the higher the scores at this level. These results suggest that teaching experience plays a progressive role in enhancing deeper levels of reflection, supporting the notion that reflective sophistication can be cultivated over time.

Finally, certification status correlated with increased pre-reflection and surface reflection. which may reflect the influence of formal pedagogical training on reflective awareness, as formal training exposes teachers to reflective concepts. This aligns with Huang (2018), who found that certification helped foster structured reflective thinking even if not immediately at deeper levels. These findings suggest that formal training might encourage pre-service teachers to move beyond superficial reflections.

CONCLUSION

This study investigated the reflective practices of Chinese pre-service teachers during their teaching internships, uncovering higher-than-expected engagement in pedagogical and critical reflection. This finding stands in contrast to earlier literature (Fan, 2018; Zhao, 2018; Dong, 2022), which emphasized surface-level or descriptive reflection as dominant.

Moreover, the study demonstrated that training pathway characteristics, particularly qualification, teaching grade level, experience, and certification, significantly shaped reflective engagement. Pre-service teachers with more academic preparation, such as high school diploma holders, and those with greater teaching experience were more likely to engage in critical reflection, reinforcing prior findings (Zhao, 2022). Grade level and certification also influenced reflection, with those teaching intermediate grades and those holding teaching certificates showing greater pre-reflective awareness.

These findings suggest that teacher education programs should provide explicit, structured opportunities for reflection. The significant impact of qualification indicates that vocational-track students, who often receive more practice-oriented training, may lack sufficient theoretical grounding, which can limit their ability to engage in deeper

levels of reflection (Zhao, 2022; Huang, 2018). To address this, teacher education programs should offer additional coursework or workshops focused on educational theory and reflective models, helping vocational-track students connect their practical experiences with broader pedagogical principles. Furthermore, the influence of teaching grade level and teaching experience highlights the need to place pre-service teachers in varied classroom settings, especially with students at different developmental stages, and to accompany these placements with structured mentoring that facilitates deeper reflection. Finally, the association between certification and lower-level reflection suggests that reflective practice should be systematically embedded into teacher certification programs. This could include requiring reflective portfolios, supervisor feedback on teaching logs, or self-assessment tasks aligned with recognized reflection frameworks (e.g., Larrivee, 2008).

Despite its contributions, the study has limitations. The reliance on self-reported data introduces potential bias, and its regional focus may limit generalizability. Furthermore, while correlations were identified, causal relationships cannot be assumed.

Future research could combine quantitative findings with qualitative data (e.g., journal analysis or interviews) or an exploration of the lived experiences of these group of teachers to gain deeper insight into their perspectives as they engage in reflective practices aimed at continuous professional growth (Goh, et al., 2017). This is to better capture the complexity of reflective thought. Longitudinal studies could also reveal how reflective practice evolves over time and in response to different training pathways, thus building a more comprehensive understanding of pre-service teachers' reflection development.

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