

A Comparative Study on Professional Identity and Teacher Professionalism between Chinese and Korean Pre-service Teachers: With a Discussion on the Limitations of Cross-Cultural Comparison

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Abstract. This study systematically investigates the structural characteristics, group differences, and cross-cultural measurement equivalence of professional identity and teacher professionalism among pre-service teachers in China and Korea. Drawing on a review of the literature, the study constructs a professional identity model encompassing four dimensions, namely professional value, professional affect, professional commitment, and professional behavioral tendency, as well as a teacher professionalism model covering four dimensions: knowledge base, pedagogical ethics, autonomous reflection, and collaborative development. A questionnaire survey was administered to approximately 600 pre-service teachers in each country, yielding a total of 1,182 valid responses. Using confirmatory factor analysis, multi-group measurement invariance testing, and structural equation modeling, the study estimates the reliability and validity of the scales in both national samples and examines configural, metric, and scalar invariance through chi-square difference tests and the " ΔCFI " criterion. Empirical results show that pre-service teachers in both countries demonstrate high levels of professional identity across all subdimensions; however, Chinese pre-service teachers score significantly higher than their Korean peers on the professional value and professional commitment dimensions, while Korean pre-service teachers score slightly higher on the autonomous reflection dimension of teacher professionalism. Measurement invariance testing supports only partial scalar invariance, indicating systematic intercept shifts for certain items across the two national contexts and suggesting that direct mean comparisons may be misleading. The study further discusses the limitations of cross-cultural comparison regarding theoretical assumptions, instrument adaptability, and interpretive boundaries, providing a methodological reference for international dialogue in future teacher education research.

Keywords: Pre-service teachers; Professional identity; Teacher professionalism; Measurement invariance; Cross-cultural comparison.

1. Introduction

Professional identity and teacher professionalism are two core concepts in teacher education research. Through a systematic review of the literature on teacher professional identity, Beijgaard, Meijer, and Verloop argued that professional identity is not a fixed attribute but rather a dynamic process of self-construction that continuously evolves through interactions among personal experience, professional knowledge, and external context [1]. For pre-service teachers who have not yet formally entered the teaching profession, the formation of professional identity is particularly critical, as it directly influences their learning engagement during the pre-service stage, their career commitment, and their future retention intentions [2]. Corresponding to professional identity, teacher professionalism focuses on the normative elements of the occupation. Evetts conceptualized it as a composite structure that simultaneously encompasses two logics: occupational professionalism, which emphasizes collegial trust, ethical self-regulation, and continuous learning, and organizational professionalism, which emphasizes administrative accountability, performance management, and standardized

procedures [3]. These two constructs are functionally complementary, jointly supporting pre-service teachers in transitioning from the student role to the teacher role.

In recent years, East Asian teacher education research has developed rapidly, yet the vast majority of studies remain confined to description and explanation within a single cultural context, lacking systematic comparisons of structural differences. China and Korea share a Confucian cultural tradition that venerates the teaching profession; however, the two countries exhibit notable divergence in their teacher preparation systems, certification examination structures, social status of teachers, and curriculum reform trajectories. Within his cultural dimensions framework, Hofstede noted that while East Asian societies belong to the higher ranges of collectivism and power distance, they still show identifiable differences in long-term orientation and uncertainty avoidance, and these differences may permeate pre-service teachers' occupational expectations and professional self-construction [4]. Through a multi-perspective longitudinal study of beginning teachers, Flores and Day demonstrated that contextual factors such as school culture, policy environments, and peer relationships continuously shape and reshape teacher identity [5], providing conceptual grounding for cross-cultural comparisons centered on national differences.

Against a backdrop of highly competitive teacher certification selection, Korean pre-service teachers face considerable external pressure in the formation of their professional identity. Research by Choi and Park on Korean pre-service teachers' professional practicum during the pandemic found that dramatic shifts in the practicum environment directly undermined participants' identification with a teacher identity and their motivation to teach [6]. Nevertheless, existing comparative studies frequently assume by default that questionnaire instruments possess equivalence across different cultural groups when used in cross-national surveys, overlooking the potential influence of cultural context on item semantics and response styles, which constitutes a significant methodological shortcoming.

Based on the above, this study poses three research questions. First, do pre-service teachers in China and Korea share a consistent factor structure for professional identity and teacher professionalism? Second, given confirmed measurement invariance, do the two groups differ significantly on each dimension at the latent mean level? Third, what are the boundaries and limitations of cross-cultural comparison in terms of theoretical assumptions and methodological implementation? To address these questions systematically, the study adopts a structured research pathway. The overall research framework is illustrated in Figure 1, which displays the complete logical chain from theoretical foundations and variable specification through instrument development, data collection, measurement invariance testing, and group comparison to the interpretation of results and methodological reflection.

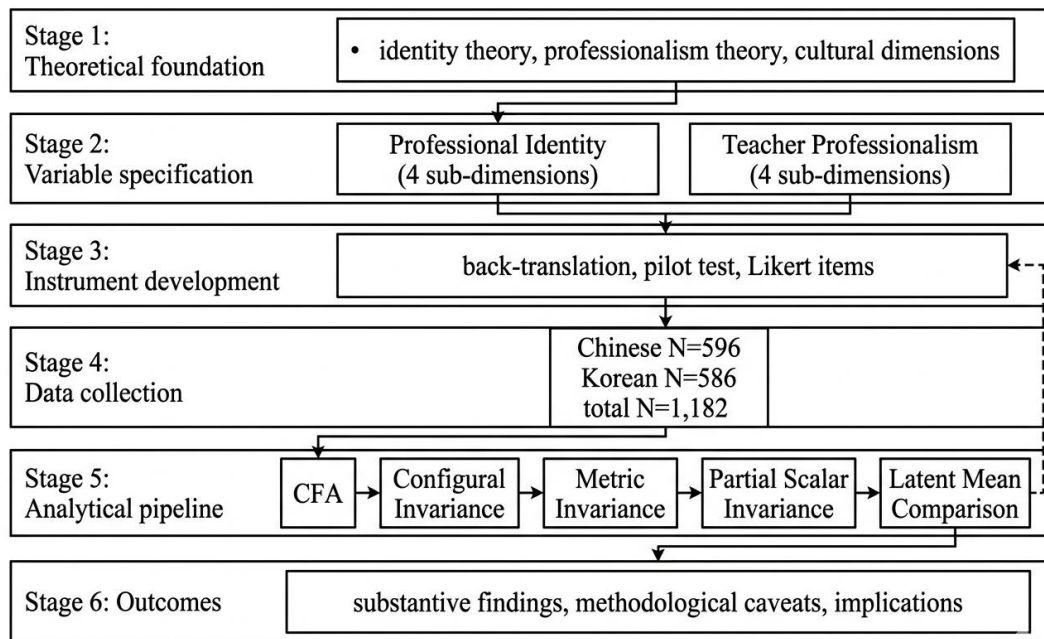


Figure 1. Research Framework

2. Data Processing

This study employed a cross-cultural questionnaire survey, with data drawn from samples of pre-service teachers in China and Korea. For the Chinese sample, stratified cluster sampling was used to recruit undergraduate pre-service teachers from Years 1 through 4 across six teacher-training institutions in three regions: East China, North China, and Southwest China. For the Korean sample, the study partnered with three colleges of education in Seoul, Busan, and Gwangju to recruit pre-service undergraduates following the same grade and subject distribution. Both national samples covered three major program categories, namely early childhood education, primary education, and secondary education, to ensure comparability.

Cross-linguistic versions of the questionnaire were produced through a rigorous back-translation procedure. The research team first developed the core items in English; two bilingual researchers whose first language was Chinese then translated these into Chinese, after which an independent translator back-translated the Chinese version into English. The research team compared the original English and back-translated English versions for semantic discrepancies and revised any ambiguous items. The Korean version was produced through the same double-blind back-translation process, carried out collaboratively by two bilingual researchers at Seoul National University of Education. After translation adaptation was complete, the researchers invited 30 pre-service teachers in each country to participate in a pilot study, and the wording of several items was fine-tuned based on pilot feedback to ensure that pre-service teachers in both countries would encounter approximately equivalent semantic structures when reading the items. This procedure is consistent with methodological recommendations in cross-cultural psychometrics [7].

The questionnaire used a five-point Likert scale, and data collection was conducted via an online survey platform; all participants submitted their responses following informed consent. A total of 1,220 questionnaires were collected; after data cleaning, 1,182 valid responses were retained, of which 596 were from the Chinese sample and 586 from the Korean sample. Criteria for excluding invalid questionnaires included excessively short response times, single-option responses persisting for more than 70 percent of all items, and missing critical demographic variables. In terms of sample demographics, females accounted for 72.3 percent of the Chinese sample and 76.8 percent of the Korean sample; the two samples were closely matched on gender ratio and grade distribution, providing a basis for subsequent comparisons.

3. Feature Design and Variable Selection

The variable system of this study comprises three sets of features. The first set consists of professional identity features. Drawing on a validated Chinese-context pre-service teacher professional identity scale [8] and integrating the theoretical framework of the present study, four dimensions are distinguished. The professional value dimension reflects pre-service teachers' cognitive appraisal of the social value and social status of the teaching profession, measured by four items. The professional affect dimension captures the emotional experience and sense of belonging that pre-service teachers associate with teaching work, comprising four items. The professional commitment dimension reflects pre-service teachers' subjective commitment to and determination to persist in a teaching career, comprising three items. The professional behavioral tendency dimension reflects the frequency with which pre-service teachers proactively engage in learning and teaching practice, comprising four items. The second set consists of teacher professionalism features, organized around four dimensions: knowledge base, pedagogical ethics, autonomous reflection, and collaborative development. Each dimension contains three to four items, and all items were adapted from international teacher standards frameworks with localization revisions for both national contexts.

The third set consists of contextual and control variables used to account for potential group heterogeneity in the residuals. Control variables include gender, grade, subject category, family region of origin, and parents' highest level of education. Two additional contextual features were introduced to capture structural differences between the two countries' teacher education systems. The first is the perceived intensity of teacher selection competition, reflecting pre-service teachers' subjective assessment of the pressure of passing teacher certification examinations in the future. This variable is of particular significance in the Korean context, given the consistently high competition rate for the Korean National Teacher Recruitment Examination. The second is curriculum reform context perception, reflecting pre-service teachers' familiarity with and endorsement of the recent curriculum reform agenda in their respective countries [9].

For each latent variable, this study used standardized scoring to compute the mean of weighted items within each dimension, yielding dimension scores ranging from 1 to 5. All continuous control variables were standardized to z -scores to eliminate differences in scale. All items were subjected to reverse-item screening and variance inflation factor diagnostics to ensure that multicollinearity remained within an acceptable range. Table 1 presents descriptive statistics and between-group mean difference tests for the key variables in both national samples.

4. Model Specification

To systematically examine the comparability of Chinese and Korean pre-service teachers on professional identity and teacher professionalism, this study sequentially conducted reliability estimation, single-group confirmatory factor analysis, multi-group measurement invariance testing, and cross-group latent mean comparison. For reliability estimation, internal consistency for each dimension was quantified using Cronbach's α coefficient, defined in Equation (1).

$$\alpha = \frac{K}{K-1} \cdot \left(1 - \frac{\sum S_i^2}{S_T^2}\right) \quad (1)$$

Here K is the number of items in the dimension, S_i^2 is the variance of the i -th item, and S_T^2 is the variance of the dimension total score. The closer this index is to 1, the stronger the internal consistency of the scale. In this study, all dimension α coefficients exceeded 0.78, meeting the basic psychometric requirement.

At the factor structure level, each dimension was specified using confirmatory factor analysis. The measurement model can be expressed as Equation (2).

$$x_{ij} = \lambda_j \xi_j + \delta_{ij} \quad (2)$$

Here x_{ij} denotes the value of the i -th observed variable on the j -th latent variable, λ_j is the factor loading of that observed variable on latent variable j , ξ_j is the latent variable, and δ_{ij} is the measurement error term. Parameters were estimated using maximum likelihood estimation, and overall model fit was evaluated against the criteria proposed by Hu and Bentler, specifically CFI no less than 0.95, TLI no less than 0.95, RMSEA no greater than 0.06, and SRMR no greater than 0.08 [10].

To test whether the scales were comparable across the two national groups, a baseline configural model, a metric invariance model, and a scalar invariance model were specified in sequence. The chi-square difference test statistic for evaluating the reasonableness of the added constraints is given in Equation (3).

$$\Delta\chi^2 = \chi_c^2 - \chi_u^2 \quad (3)$$

Here χ_c^2 squared and χ_u^2 squared denote the chi-square values of the constrained and baseline models, respectively; $\Delta\chi^2$ follows a chi-square distribution with degrees of freedom equal to Δdf . Because the chi-square difference test is sensitive to sample size, the ΔCFI index recommended by Cheung and Rensvold was adopted as a supplementary criterion, with an absolute value of ΔCFI below 0.01 serving as the threshold for supporting invariance constraints [11].

Once an appropriate level of invariance had been confirmed, the study used Cohen's standardized mean difference index d to quantify the magnitude of differences between the two national groups on each dimension. The formula is given in Equation (4).

$$d = \frac{M_{CN} - M_{KR}}{s_p}, s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}} \quad (4)$$

Here M_{CN} and M_{KR} are the means for the Chinese and Korean samples, respectively; s_p is the pooled standard deviation; n_1 and n_2 are the sample sizes; and s_1 and s_2 are the standard deviations for the two samples. Following Cohen's classical classification, d values of approximately 0.2, 0.5, and 0.8 correspond to small, medium, and large effect sizes, respectively [12]. When interpreting group differences, the study reports both significance levels and effect sizes to avoid interpretive bias arising from sole reliance on p -values. All statistical analyses were conducted in R using the lavaan and semTools packages.

5. Empirical Analysis

Descriptive statistics and between-group mean difference tests are summarized in Table 1. Chinese pre-service teachers scored significantly higher than Korean peers on the professional value and professional commitment dimensions, with Cohen's d of 0.42 and 0.31, respectively, reaching a medium level; on the autonomous reflection dimension of teacher professionalism, Korean pre-service teachers scored slightly higher than Chinese peers, with an effect size of 0.18, falling within the small effect range. Differences between the two national samples on the professional affect and pedagogical ethics dimensions were small and did not reach statistical significance.

Table 1. Descriptive Statistics and Difference Tests for Key Variables in Chinese and Korean Samples

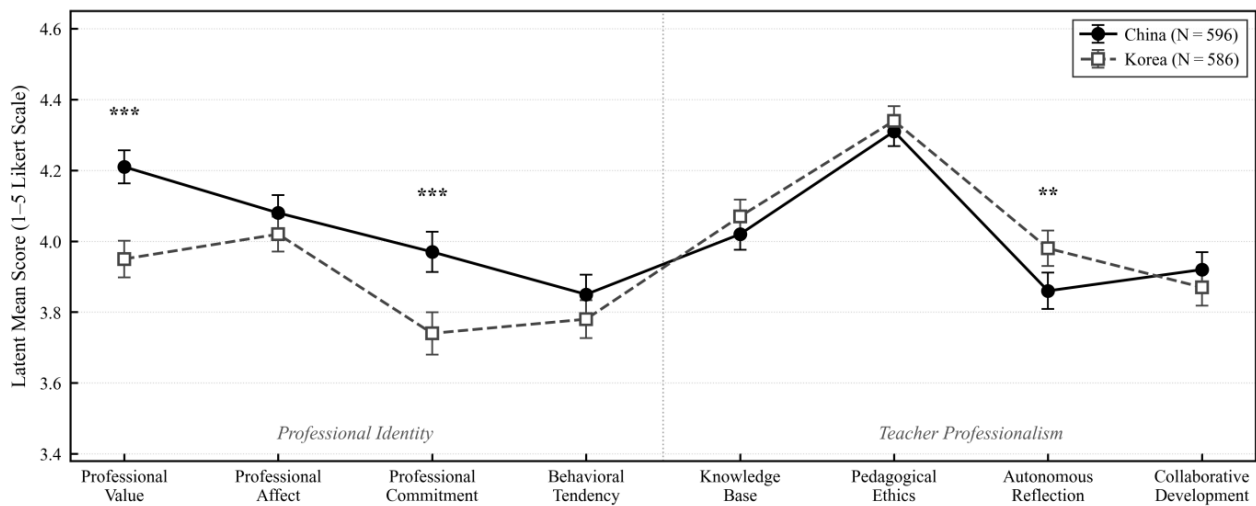
Dimension	China M (SD)	Korea M (SD)	t	p	d
Professional Value	4.21 (0.58)	3.95 (0.64)	7.32	<0.001	0.42
Professional Affect	4.08 (0.63)	4.02 (0.61)	1.65	0.099	0.10
Professional Commitment	3.97 (0.71)	3.74 (0.74)	5.43	<0.001	0.31
Behavioral Tendency	3.85 (0.69)	3.78 (0.66)	1.78	0.075	0.10
Knowledge Base	4.02 (0.55)	4.07 (0.59)	1.50	0.134	0.09
Pedagogical Ethics	4.31 (0.52)	4.34 (0.51)	1.00	0.317	0.06
Autonomous Reflection	3.86 (0.64)	3.98 (0.62)	3.27	0.001	0.18
Collaborative Development	3.92 (0.61)	3.87 (0.64)	1.37	0.171	0.08

The study then estimated configural, metric, and scalar invariance models in sequence to test whether the professional identity and teacher professionalism scales possessed measurement equivalence across the two national samples. Fit indices and difference test results for each invariance level are summarized in Table 2. The configural model achieved acceptable fit in both national groups, with CFI exceeding 0.95 and RMSEA below 0.06, thus supporting configural invariance. In the metric invariance model, all factor loadings were constrained to equality across groups; the chi-square difference test was significant but ΔCFI was only 0.004, below the 0.01 threshold, thus supporting metric invariance. For the full scalar invariance model, however, ΔCFI reached 0.013, exceeding the threshold, indicating systematic intercept differences for certain items between the two countries and rendering full scalar invariance untenable. Sequential freeing of intercept constraints revealed significant intercept shifts for two items related to social status in the professional value dimension and one item related to long-term commitment in the professional commitment dimension. A partial scalar invariance model was ultimately adopted for latent mean comparisons. The latent mean profiles are displayed in Figure 2, which presents side-by-side latent mean comparisons for the two national groups across all eight dimensions.

Table 2. Multi-Group Measurement Invariance Testing Results

Model	χ^2	df	CFI	RMSEA	SRMR	$\Delta\chi^2$	ΔCFI
Configural Invariance	1284.6	538	0.958	0.049	0.041		
Metric Invariance	1326.5	564	0.954	0.048	0.046	41.9*	0.004
Partial Scalar Invariance	1382.4	584	0.951	0.049	0.048	55.9*	0.003
Full Scalar Invariance	1448.7	590	0.945	0.052	0.051	122.2*	0.013

To further examine how measurement invariance results influence conclusions about group comparisons, the study conducted a parallel analysis of latent mean differences under full versus partial scalar invariance. When full scalar invariance was forcibly assumed, the mean advantage of Chinese pre-service teachers on the professional value dimension was systematically inflated, with the effect size rising from 0.42 to 0.61; a substantial portion of that difference was in reality attributable to item intercept shifts rather than genuine latent variable differences. This result is consistent with the methodological warning raised by Chen, who demonstrated that ignoring partial invariance violations can produce spurious group differences [13]. The specific effect size comparisons under the two invariance assumptions are shown in Figure 3, which uses side-by-side bars to display the divergent conclusions reached under each assumption for the same comparison.



Note. Error bars represent 95% confidence intervals. ** $p < .01$, *** $p < .001$ (two-tailed independent samples t-test). Latent means estimated under partial scalar invariance.

Figure 2. Latent Mean Profile Comparison for Chinese and Korean Pre-service Teachers Across Eight Dimensions

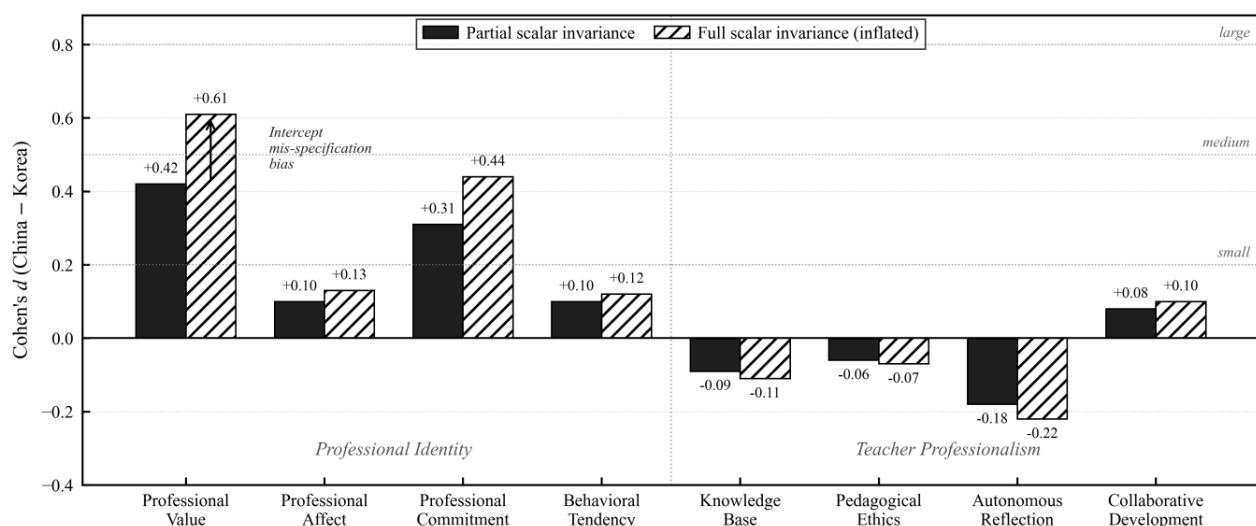


Figure 3. Effect Size Comparisons for Chinese versus Korean Pre-service Teachers Under Two Invariance Assumptions

Synthesizing the findings from Table 1, Table 2, Figure 2, and Figure 3, three core conclusions emerge. First, there are indeed observable differences between Chinese and Korean pre-service teachers on several dimensions of professional identity: Chinese pre-service teachers score higher on the professional value and professional commitment dimensions, which reflect societal expectations, while Korean pre-service teachers score higher on the autonomous reflection dimension, which reflects professional agency. Second, differences between the two groups on professional affect, pedagogical ethics, and knowledge base are small, consistent with the shared Confucian educational cultural tradition of the two countries. Third, directly comparing national means without first conducting measurement invariance tests significantly amplifies differences on certain dimensions and produces misleading comparative conclusions. This finding echoes the instrument equivalence concerns highlighted by Park and Byun in cross-national comparative research on teacher attractiveness [14]. This study emphasizes that any cross-cultural teacher education comparison must treat measurement invariance as a prerequisite condition to be taken seriously.

It should also be noted that cross-cultural comparison itself has inherent interpretive boundaries. Even when partial equivalence is achieved at the measurement level, the conceptual extension of latent

variables may still differ across cultural contexts. For instance, autonomous reflection in the Korean context may be associated with the evidentiary requirements for self-efficacy under teacher evaluation systems, whereas the same concept in the Chinese context may be more deeply embedded in reflective journals and teaching research activities. This conceptual asymmetry is difficult to eliminate through statistical procedures and requires interpretive caution. Research by Choi and Park similarly suggests that even when measurement converges, pre-service teachers' actual experiences may carry different meanings depending on institutional context [6].

6. Conclusion

This study systematically tested the cross-cultural equivalence of professional identity and teacher professionalism scales in Chinese and Korean pre-service teacher samples and conducted between-group mean comparisons under the constraints of established invariance. The findings indicate that pre-service teachers in both countries share a broadly consistent factor pattern in the core structure of professional identity and teacher professionalism; metric invariance was supported, but full scalar invariance was not, indicating that the semantic baseline for certain items differs across the two national contexts. After controlling for measurement invariance, Chinese pre-service teachers scored significantly higher than Korean peers on the professional value and professional commitment dimensions, while Korean pre-service teachers scored slightly higher on the autonomous reflection dimension. This finding reflects both commonalities across the two groups and differences shaped by institutional environments and cultural traditions.

The methodological contribution of this study lies in its precise measurement invariance testing, which explicitly identifies the potential biases introduced when cross-national mean comparisons are conducted without the prerequisite of equivalence. This finding is consistent with the classical caution of cross-cultural psychometrics [15], which urges researchers comparing teacher education groups to extend their evaluative framework beyond reliability and validity to encompass measurement invariance. At the theoretical level, the study demonstrates that although professional identity and teacher professionalism share a basic structure in both countries, the semantic baseline at the item level can be influenced by institutional incentives and social expectations. This implies that cross-cultural comparison should be understood as a bounded and exploratory undertaking requiring continuous discernment of its limits, rather than a straightforward substitution of group means.

This study has several limitations that future research may address in three directions. First, the sample covers only undergraduate pre-service teachers in China and Korea and does not include graduate-level pre-service teachers or individuals who have passed teacher certification examinations but have not yet entered the profession, leaving room to expand the sample representativeness. Second, the study employs a cross-sectional design that cannot reveal the dynamic development of professional identity and teacher professionalism; future research could combine longitudinal tracking with sequential invariance testing to further characterize developmental trajectories. Third, although the study controls for several contextual variables, it was unable to directly incorporate the structural differences between the teacher education curricula of the two countries; future research might deepen explanatory power regarding difference mechanisms by combining institutional ethnography or policy text analysis with quantitative data. Ultimately, this study aims to provide a methodologically rigorous and theoretically generative reference case for international dialogue on teacher education in East Asia.

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