


## Article

# Multidimensional Psychometrics of Teacher Educators' Professional Identity: An Initial Validation with Teacher Educators in Southeast Asia

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**Abstract:** While prior quantitative research has proposed a scale for measuring teacher educators' professional identity in terms of two dimensions, a qualitative study and comprehensive review of the literature suggested that this factor actually consists of six dimensions: teacher of teachers, researcher, coach, curriculum developer, gatekeeper, and broker. The purpose of this study was to examine whether it is possible to measure teacher educators' professional identity in terms of these six dimensions. A total of 192 teacher educators from Southeast Asian countries (Cambodia, Vietnam, and Thailand) participated in this study and responded to items we developed to measure their professional identity in addition to providing their basic attributes such as age, gender, highest level of education, and years of service as teachers or teacher educators. The results of a confirmatory factor analysis indicated that the six-factor model was acceptable and permitted the assessment of teacher educators' professional identity in terms of six dimensions. The results also show that women exhibit a stronger professional identity as teachers of teachers than do men and that the higher the respondents' highest level of education, the stronger their professional identity as teachers of teachers, coaches, curriculum developers, or gatekeepers.

**Keywords:** teacher educator; professional identity; factor analysis; psychometrics; Southeast Asia



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## 1. Introduction

Developing a quality education system that is relevant to the society and economy of the 21st century has become a top priority for most governments and nations [1]. Establishing a quality education system requires competent teachers, and the development of quality teachers has become a global concern [2,3]. Teacher educators are considered to be “at the core of good teacher education” [4], and their activities significantly impact the quality of future teachers [5]. Because of the importance of their role, teacher educators have received increasing attention in recent years, and this attention has focused primarily on the emerging concept of teacher educators' professional identity [6]. Although most research on the content of teacher educators' professional identity has employed qualitative research methods [7–9], it is also worthwhile to investigate this topic using quantitative research methods. In the current study, items were developed to measure the professional identity of teacher educators in terms of six dimensions, and a quantitative survey of

teacher educators in three East Asian countries, i.e., Cambodia, Vietnam, and Thailand, was conducted. Then, by performing confirmatory factor analysis on the data thus obtained, we tested the possibility of measuring their professional identity in terms of the six dimensions we identified.

### *1.1. Definition of Teacher Educator*

Teacher educators have occasionally been described as teachers of teachers [10]. However, finding a satisfactory description of teacher educators is difficult. They represent a mixed and diverse group of professionals who are responsible for a variety of different tasks and practices in both preservice and in-service teacher education [8,11]. In this broad sense, the phrase “teacher educator” is used as an umbrella term that encompasses all types of people who are involved in and responsible for preparing preservice and in-service teachers [12]. Some teacher educators focus primarily on preservice training at universities, while others work in schools or other practice-oriented institutions and focus primarily on training preservice teachers [12]. We adopted the definition of teacher educators provided by European Commission [13], which depicts them as “those who actively facilitate the (formal) learning of student teachers and teachers” (p. 8). This definition includes all those who are responsible for teaching and supporting students of teaching, inexperienced teachers, and in-service teachers in teacher education institutions and schools.

### *1.2. Professional Identity of Teacher Educators*

Although the definitions of identity they provide and no unified view of this concept have been offered, identity is generally considered to refer to a shared set of meanings that define individuals who play specific roles in society (for example, a parent, worker, spouse, or teacher role identity), members of specific groups in society (for example, a church, book club, or softball group identity), and those who possess certain characteristics that distinguish them from others (for example, an athletic or artistic person identity) [14]. Most contemporary researchers have agreed that identity is constructed within a social context and is shifting and dynamic rather than stable and fixed [15]. Identity has the function of organizing an individual’s “place” in the context of interaction, guiding the individual’s behavior, facilitating the development of stable social relationships, and facilitating interaction [16].

The growing interest in teacher educators has primarily led to research on the concept of teacher educators’ professional identity. Vocational identity is a concept that encompasses how we perceive ourselves within our professional context and how we communicate this perception to others [7,17]. In the literature, this notion has occasionally been described in terms of “self-understanding” [18,19] or a “persona” [20]. It consists of the habits, knowledge, skills, beliefs, and attitudes associated with one’s profession and is based on one’s personal background and experiences [21]. In the context of teacher education, Kelchtermans [19] described the concept of professional identity as “a lens through which teachers (educators) look at their job, give meaning to it and act [with]in it” (p. 260). The formation of a professional identity as a teacher educator occurs when teacher educators work and interact with colleagues, student teachers, and others who are involved in teacher education [22]. Identity itself, however, is not easy to acquire. Teacher educators form their identities over time, in context, and in practice [23]. The formation of such a professional identity has been recognized as a central process in becoming a teacher educator [24], and it is an important process that is closely linked to practice [25].

Researchers have reached a consensus indicating that professional identity is a multi-dimensional concept [26], and Richter divided teacher educators’ professional identity into four elements. The first such element, task perception, refers to the individual’s understanding of the job for which he or she feels responsible. The second, self-efficacy, represents the perception of being able to cope successfully with the requirements specific to one’s occupation. The third element is job satisfaction, which indicates the individual perception of satisfaction that arises as a result of success or failure at work. The fourth element is

beliefs on teaching, which emphasizes the personal system of beliefs that an individual has regarding education and the corresponding practices. Causal relationships among these constructs have been suggested; for example, Canrinus et al. [26] proposed a causal model according to which self-efficacy is the starting point for increased job satisfaction, motivation, and professional commitment. Thus, the professional identity of teacher educators is considered to be composed of multiple elements. Among these elements, this study focuses on task perception.

In a previous study on this topic, Koster et al. [8] investigated how teacher educators perceive the tasks they must perform. They first developed a list of teacher educators' tasks based on the results of a literature review and interviews with teacher educators. They then administered a questionnaire to teacher educators that focused on their need for each of the tasks on this list. The results showed that teacher educators viewed the following as major tasks: developing their own competencies and those of their colleagues, providing teacher education programs for student teachers, and being involved in policy making that contributes to the development of teacher education.

Two relatively recent qualitative studies [7,9] involved interviews and questionnaires with teacher educators, and both studies identified two groups of teacher educators with similar professional identities. Members of the first group of teacher educators were labeled "pedagogues" and "reflective teachers" by Vanasche and Kelchtermans [9] and "facilitators of student learning" and "communicators" by Jonker et al. [7]. Members of this group do not view the job of the teacher educator as simply that of imparting subject matter knowledge or simple know-how regarding teaching but rather as involving the adoption of a learner-centered stance, the development of situational skills that can serve students well in the future, and a conception of their job as supporting the personal growth and development of their students. In contrast, members of the second group were identified as "teacher educators of subject knowledge" by Vanasche and Kelchtermans [9] and "transmitters of knowledge" by Jonker et al. [7]. Members of this group recognize the fact that their task is to convey detailed knowledge regarding a particular subject as well as the subject-specific strategies and methods for teaching it.

Recent quantitative studies conducted by Richter et al. [25] supported the results of the aforementioned qualitative studies [7,9]. These authors consulted previous research [7,9], representatives of institutions offering formal training programs for teacher educators and the Ministry of Education, and experienced teachers. Based on discussions with educators, items for a scale measuring teacher educators' professional identity were developed. Factor analysis was conducted on data collected from 145 teacher educators, and two factors were identified in line with previous qualitative research [7,9]. The first such factor was labeled "facilitator". This factor identifies the extent to which teacher educators view their work primarily focused on providing support for teacher development and facilitating teachers' reflection on their own teaching. The second factor, which was labeled "transmitter", indicates the degree to which teacher educators perceive their job as being primarily that of transmitting professional knowledge.

The study conducted by Richter et al. [25] aimed to measure the professional identity of teacher educators quantitatively and proposed to measure this factor in terms of two dimensions. However, a limitation of the process of creating this scale was that it did not account for the work of Lunenberg et al. [27], which represents the most comprehensive and excellent recent research on the role of teacher educators. Lunenberg et al. [27] qualitatively analyzed 405 references to the roles of teacher educators made over the past 20 years and organized these roles into six categories: teacher of teachers, researcher, coach, curriculum developer, gatekeeper, and broker.

The teacher of teachers plays the role of transferring academic knowledge to students and teachers and enables these individuals to learn to apply theoretical knowledge in practice; the researcher conducts research on subject education, students, teachers, and the teacher educators' own educational practices; the coach generously supports student teachers in their practice and reflection, including by providing emotional support; the

curriculum developer actively engages in discussions regarding curriculum development in the context of education; the gatekeeper evaluates and certifies students and guarantees teachers' ability to teach; and the broker bridges the gaps between schools and teacher education institutions and brings them into closer cooperation. Although the interrelationships among these six roles are not clear at this time, Lunenberg et al. [27], in their review of the literature on the topic, emphasized the fact that a key task of the teacher educator is to teach by facilitating teacher learning; in addition, they claimed that the role of the teacher of teachers is a central element of the teacher educator's professional identity. These roles are required of teacher educators by their environment, but if they perceive these roles as their tasks, the roles can be viewed as their professional identity. Accordingly, it is conceivable that teacher educators' professional identity is much more multidimensional than could be accounted for by the two dimensions proposed by Richter et al. [25] and may actually feature six dimensions.

### 1.3. Present Study

As noted above, most studies of teacher educators' professional identities have used qualitative methodologies [7–9], and their value would be enhanced if the validity of their findings received further support from quantitative analyses. The only exception to this general principle is Richter et al. [25], who proposed capturing and measuring teacher educators' professional identity in terms of two dimensions through quantitative analysis. However, that study did not consider the most comprehensive work on teacher educators, i.e., Lunenberg et al. [27]. The present work thus suggests that teacher educators' professional identity is more multidimensional than could be accounted for by the two dimensions proposed by Richter et al. [25] and can actually be measured in terms of six dimensions.

Accordingly, we developed items to measure teacher educators' professional identity comprehensively in terms of six dimensions based on Lunenberg et al. [27]. We then conducted a survey of teacher educators in three Southeast Asian countries, i.e., Cambodia, Vietnam, and Thailand, to test the feasibility of measuring teacher educators' professional identity quantitatively in terms of these six dimensions. We also reported the relationships between each dimension of the scale and basic attributes such as age, gender, last education, and years of service as a teacher.

Richter et al. [25] used a two-dimensional instrument they developed to show that teacher educators' professional identity determines whether they engage in effective teaching practice. If an instrument that can measure teacher educators' professional identity in terms of six dimensions is developed based on this study, it will be possible to examine the relationship between this factor and educational practice in more detail and to advance the discussion concerning what kind of professional identity would be desirable for teacher educators to develop. Therefore, the findings of this study may facilitate the development of future programs aimed at supporting the development of teacher educators.

## 2. Materials and Methods

### 2.1. Participants

A total of 201 participants from three Southeast Asian countries, i.e., Cambodia, Vietnam, and Thailand, participated in this study. As a screening question, the European Commission's [13] definition of a teacher educator was first presented to the participants, who were then asked whether they were teacher educators; the potential answers were "yes" and "no". The responses of 192 teacher educators were used in the analysis after excluding the 9 participants who answered "no" to this question. There were no missing data for any of the 192 participants. By country, 94 participants were from Cambodia (67 men and 27 women), 68 were from Vietnam (17 men and 51 women), and 30 were from Thailand (11 men and 19 women). The gender ratio differed significantly by country,  $\chi^2(2) = 36.14$  ( $p < 0.001$ ), and residual analysis indicated a higher ratio of men in Cambodia and a higher ratio of women in Vietnam. The mean age of participants in each country

was 40.59 (SD = 6.06) in Cambodia, 40.83 (SD = 7.21) in Vietnam, and 41.67 (SD = 8.87) in Thailand. An analysis of variance (ANOVA) indicated a significant effect of participant age by country,  $F(2, 189) = 8.01$ ;  $\eta_p^2 = 0.08$ ;  $p < 0.001$ . Multiple comparisons made using the Holm method ( $\alpha = 0.05$ ) showed that the average age of participants in Thailand was higher than that of participants in the other two countries. In Cambodia, 5.32% of participants had a doctorate (Ph.D.), 82.98% had a master's degree, and 11.70% had a bachelor's degree as their highest level of education. In Vietnam, 58.82% of participants had a doctorate (Ph.D.) degree, 38.24% had a master's degree, 1.47% had a bachelor's degree, and 1.47% had an associate's degree. In Thailand, 83.33% had a doctorate (Ph.D.) degree, while 16.67% had a master's degree. The highest levels of education attained by the participants significantly differed by country,  $\chi^2(6) = 87.05$  ( $p < 0.001$ ), with the Cambodian respondents having higher rates of master's and bachelor's degrees and lower rates of doctorate (Ph.D.) degrees. Doctorate (Ph.D.) acquisition rates were low in Cambodia. In Vietnam and Thailand, the number of respondents with doctorate (Ph.D.) degrees was high and that of respondents with master's degrees was low. In addition, the number of respondents with bachelor's degrees was low in Vietnam.

The study was approved by the Ethics Committee of the Graduate School of International Development Cooperation, Hiroshima University (approval code: HUIDEC-2021-0056) and conducted in accordance with the principles of the Declaration of Helsinki. Participants did not receive any remuneration for their participation.

## 2.2. Procedure

All surveys were conducted in English. Participants were recruited with the support of research collaborators in the target countries with whom the authors have had long-standing research contact, such as teacher educators working in teacher training institutions and Ministry of Education officials. Participants were recruited by posting a link to a Google Forms survey on social media networks on which local research collaborators shared information with teacher educators, as well as by sending this link to teacher educator contacts who were personally known by either the authors or the local research collaborators. Participants provided informed consent and completed the questionnaire online in their free time.

## 2.3. Measures

### 2.3.1. Teacher Educator Identity

In line with the six roles of teacher educators proposed by Lunenberg et al. [27], namely, teacher of teachers, researcher, coach, curriculum developer, gatekeeper, and broker, we generated a pool of 32 items; five to seven items were associated with each role. This work was performed by the seven authors of this study, and the wording of the items was finalized through discussion. Furthermore, the items were refined by asking teacher educators and teacher educator researchers in the surveyed countries to check and revise them multiple times. Participants rated these items on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree).

### 2.3.2. Years of Service as a School Teacher and as a Teacher Educator

Educational institutions were classified into five categories: (a) kindergarten/preprimary school, (b) elementary/primary school, (c) lower secondary school, (d) upper secondary school, and (e) higher education institutions. The respondents were asked to indicate their number of years of service in each type of institution. In this study, scores regarding categories (a)–(d) were combined and separated from scores regarding category (e) for the analysis. Specifically, the average of scores for categories (a)–(d) was used to indicate the participant's years of service in the K13 context, and the score for category (e) was used to indicate the participant's years of service in the higher education context.



### 2.3.3. Highest Level of Education

Participants were asked to select one of four categories to indicate their highest level of education: (a) doctorate (Ph.D.), (b) master's degree, (c) bachelor's degree, or (d) associate's degree. In the correlation analysis, an associate's degree was scored as 1 point, a bachelor's degree as 2 points, a master's degree as 3 points, and a doctorate (Ph.D.) as 4 points.

### 2.3.4. Other Demographic Variables

Participants indicated their age, gender, and country of residence.

## 2.4. Data Analysis

First, we calculated descriptive statistics for the 32 items used to measure teacher educator identity; following the suggestions of In'nami [28], we excluded items with kurtosis and skewness greater than  $\pm 2$  in absolute value, treating them as abnormal distributions.

Next, a confirmatory factor analysis was performed on the remaining items to examine the validity of the six-factor model. Kline [29] recommended the chi-square test, RMSEA, CFI, and SRMR, as measures of goodness of fit. The criterion for a model being a good fit is that it provides nonsignificant results at a threshold of 0.05 for the chi-square test [30]; a CFI above 0.90 and RMSEA and SRMR below 0.80 are recommended [31]. However, the chi-square test is sensitive to sample size, and when large samples are used, this approach almost always rejects the model [32]. When small samples are used, the chi-square statistic lacks power and cannot discriminate between models that exhibit a good fit and models that exhibit a poor fit, which is a problem [33]. We used the relative/normed chi-square ( $\chi^2/\text{df}$ ) developed by Wheaton et al. [34] as an example of a statistic that minimizes the effect of sample size on the chi-square. The recommended value for this statistic is less than 5.0 [31].

In addition, the relationships between each of the six teacher educator identities and gender, age, education, years of service in K13, and years of service in higher education were examined using zero-order correlation coefficients.

Finally, we investigated whether differences in the scores for the six dimensions of occupational identity could be observed across countries. Since differences were observed across countries in terms of gender, age, and highest level of education, we performed a multivariate analysis of variance (MANOVA) while controlling for these factors. When significant effects were found, multiple comparisons were made using the Holm method ( $\alpha = 0.05$ ). The analytical software HAD version 15 [35] was used for all the analyses in this study.

## 3. Results

### 3.1. Confirmatory Factor Analysis

First, we calculated the means, standard deviations, kurtosis, and skewness of the 32 items developed to measure teacher educator identity. Following the suggestions of In'nami [28], five items whose kurtosis and skewness exceeded  $\pm 2$  in absolute value were excluded from the analysis, as they were not normally distributed.

A confirmatory factor analysis was performed on the remaining 27 items, assuming a six-factor model (Table 1). The results yielded the following goodness-of-fit indices:  $\chi^2/\text{df} = 1.56$ , CFI = 0.89, RMSEA = 0.05, SRMR = 0.06. Although the value of CFI was slightly below the guideline of 0.90, all other indices were acceptable, and the six-factor model was judged to fit the data adequately.

**Table 1.** Confirmatory factor analysis results and correlations among factors.

	Factor					
	1	2	3	4	5	6
Teacher of teachers						
14. I believe that the most important part of being a teacher educator is to be able to teach students in a way that would serve as a model for their own future classes.	0.70					
13. I believe that to teach the importance of active learning, teacher educators must first be active learners in their own classrooms.	0.63					
20. I believe that as a teacher educator, I must first be able to exercise the behaviors that I want my students to implement.	0.56					
6. I believe that the foundation of a teacher educator's profession is their experience of teaching in classrooms with diverse learners.	0.53					
3. I believe that if you want to teach a certain teaching method to your students, you must first be able to successfully use that method to teach yourself.	0.50					
Researcher						
10. I would like to grow as a teacher educator through research activities.		0.64				
26. I believe that teacher educators can have a better career by doing research work.		0.64				
12. I believe that for teacher educators, research is a way of life.		0.62				
31. I believe that publishing research papers yearly is a requirement for being a good teacher educator.		0.61				
19. I believe that as teacher educators, we must prioritize research activities over teaching activities.		0.45				
Coach						
17. I believe that teacher educators are expected to empathize with students' concerns.			0.65			
25. As a teacher educator, I believe I should support students who find it difficult to keep up with the class.			0.61			
24. As a teacher educator, I believe it is important to support my students outside the classroom.			0.60			
1. As a teacher educator, I believe it is necessary to provide emotional support to my students.			0.56			
5. I believe that it is the job of teacher educators to counsel individual students and address any concerns they may have.			0.56			
Curriculum developer						
21. As a teacher educator, I want to develop curricula that make it easier for students to learn professional knowledge.				0.57		
7. As a teacher educator, I believe it is important to develop a curriculum that trains students to design lessons from the learner's perspective.				0.54		
4. As a teacher educator, I believe it is important to develop a curriculum that allows students to put the theories they have learned into practice.				0.40		
Gatekeeper						
18. I believe that to properly evaluate students, teacher educators should first set quality standards that students must achieve.					0.63	
32. I believe that as teacher educators, we should use a variety of assessment methods to determine whether students meet the required standards.					0.57	
16. I believe it is the role of teacher educators to not send out students to teach in schools if they are not professional enough to be teachers.					0.51	
11. As a teacher educator, I believe that student evaluations should incorporate assessment methods that meet the needs of the school.					0.41	
Broker						
29. As a teacher educator, I believe it is important to create a space where I can learn from schoolteachers.						0.72
28. As a teacher educator, I believe it is important to build a strong relationship between teacher education institutions (such as universities and colleges) and schools.						0.69
23. As a teacher educator, I believe it is important to work closely with schools to guide students.						0.65
30. As a teacher educator, I would prefer to be able to negotiate with schools.						0.63
22. I believe it is the role of teacher educators to communicate and coordinate with teachers of the schools where students would be practicing teaching.						0.58

### 3.2. Descriptive Statistics, Cronbach's Alpha Coefficients, and Cross-Correlations for the Study Variables

Descriptive statistics, Cronbach's alpha coefficients, and cross-correlations for the study variables are presented in Table 2. The Cronbach's alpha coefficients for the six subscales measuring teacher educators' professional identity were somewhat low with regard to curriculum developers and gatekeepers ( $\alpha = 0.51$  and  $0.59$ , respectively) but were acceptable with respect to the other subscales ( $\alpha > 0.72$ ). Zero-order correlation coefficients were calculated for the study variables, and the six teacher educator identities were weakly to moderately positively correlated ( $r_s = 0.37$  to  $0.61$ ,  $p_s < 0.001$ ). Gender was positively correlated with teacher of teachers ( $r = 0.15$ ,  $p < 0.05$ ). The highest level of education was positively correlated with the teacher of teachers, coach, curriculum developer, and gatekeeper variables ( $r = 0.14$  to  $0.18$ ,  $p_s < 0.05$ ).

**Table 2.** Cronbach's alpha coefficients, descriptive statistics, and cross-correlations for the study variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Teacher of teachers	1										
2. Researcher	0.49 **	1									
3. Coach	0.61 **	0.49 **	1								
4. Curriculum developer	0.57 **	0.41 **	0.60 **	1							
5. Gatekeeper	0.54 **	0.37 **	0.56 **	0.58 **	1						
6. Broker.	0.52 **	0.46 **	0.63 **	0.46 **	0.39 **	1					
7. Gender (male = 1; female = 2)	0.15 *	0.00	0.11	0.11	0.06	0.07	1				
8. Age	0.12	0.03	0.04	0.03	0.07	0.03	−0.02	1			
9. Final education	0.16 *	0.04	0.17 *	0.14 *	0.18 *	0.04	0.25 **	0.27 **	1		
10. Years of service in K13	0.03	0.12	0.04	0.06	0.04	0.00	−0.15 *	0.14	0.06	1	
11. Years of service in higher education	0.08	−0.07	0.03	0.08	0.02	−0.06	0.31 **	0.48 **	0.33 **	−0.20 **	1
$\alpha$	0.72	0.72	0.73	0.51	0.59	0.79	—	—	—	—	—
<i>M</i>	3.45	3.28	3.44	3.39	3.39	3.43	—	40.84	3.29	3.98	11.22
<i>SD</i>	0.43	0.50	0.41	0.45	0.45	0.45	—	6.95	0.60	6.52	7.75

Note.  $N = 192$ . \*  $p < 0.05$ . \*\*  $p < 0.01$ .

### 3.3. Three-Country Comparison of Professional Identity Scores

Six professional identity scores of teacher educators were calculated for each country (Table 3), and an MANOVA was conducted while controlling for gender, age, and highest level of education to identify any differences in the scores of the six teacher educator types across countries. The results showed a significant effect for coaches,  $F(2, 186) = 5.15$ ;  $\eta_p^2 = 0.05$ ;  $p < 0.01$ . Multiple comparisons showed that these scores were higher in Thailand than in Cambodia and Vietnam. A significant effect was also detected for brokers,  $F(2, 186) = 3.47$ ;  $\eta_p^2 = 0.04$ ;  $p < 0.05$ , and multiple comparisons revealed higher scores in Thailand than in Vietnam in this context. No significant differences were found with regard to the other teacher educator identities.

**Table 3.** Professional identity scores for the three countries.

	Cambodia ( $n = 94$ )		Vietnam ( $n = 68$ )		Thailand ( $n = 30$ )	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Teacher of teachers	3.39	0.44	3.44	0.42	3.66	0.35
Researcher	3.33	0.48	3.20	0.51	3.31	0.54
Coach	3.36	0.42	3.44	0.35	3.69	0.36
Curriculum developer	3.50	0.45	3.54	0.36	3.57	0.43
Gatekeeper	3.30	0.45	3.50	0.43	3.57	0.43
Broker	3.42	0.47	3.20	0.40	3.62	0.46



#### 4. Discussion

This study is the first to identify the six professional identities of teacher educators suggested by Lunenberg et al. empirically [27]. Items were developed based on the conceptualization of the six roles proposed by those authors, and a survey was administered to teacher educators in Cambodia, Vietnam, and Thailand, all of which are in East Asia. The results of a confirmatory factor analysis indicated that the six-factor model fit the data. That is, East Asian teacher educators identified the six roles of teacher educators by Lunenberg et al. [27] as their tasks, and these roles were also found to represent measurable professional identities.

Similar to our study, Richter et al. [25] conducted a study that quantitatively analyzed and measured the professional identity of teacher educators. These authors examined two dimensions of professional identities of teacher educators, i.e., “facilitator” and “transmitter”. The role of facilitators is to support the development of students’ skills, but this role also entails establishing a trusting relationship with students and providing them with psychological support after the course has concluded. Therefore, we believe that this dimension measures something similar to the coach role in our study. Transmitters are mainly responsible for transmitting expertise in a particular subject or teaching method to students, which is very similar to the teacher of teachers role in our study. The other four aspects of professional identity that we identified were measured for the first time in this study, and, compared to the scale developed by Richter et al. [25], our scale facilitates a more comprehensive assessment of teacher educators’ professional identity.

To perform an initial investigation of our scale, we also examined the relationships between each of the six dimensions of occupational identity and basic attributes such as age, gender, and highest level of education. The results showed that women perceived their professional identity as teachers of teachers more strongly than did men. This result can be interpreted from the perspective of gender differences in the perceptions of teachers. Being a teacher of teachers is a central aspect of the professional identity of teacher educators, and this role is close to that of teachers in primary and secondary education. Women have been shown to be more likely than men to perceive that such a teacher role is expected of them [36]. Therefore, it is possible that women felt more strongly about their professional identity as teachers of teachers than did men. People who had attained higher levels of education had stronger identities as teachers of teachers, coaches, curriculum developers, or gatekeepers. The results of this study are not surprising, as the higher the respondents’ highest level of education, the deeper their understanding of the teacher educator’s job, and the stronger their identification with various aspects of their professional identity.

When we investigated the possibility of differences in teacher educators’ scores with regard to the six professional identities across countries, we found that the respondents in Thailand identified more strongly with the professional identity of coach than did respondents in Cambodia and Vietnam. This result may be due to the fact that Thailand is one of the countries in Southeast Asia in which bilateral supportive relationships or a spirit of compassion and caring are prevalent and valued throughout society, including in educational settings [37]. In addition, teacher educators in Thailand identified more strongly as brokers than did teacher educators in Vietnam. This finding may be due to the pervasive culture of Thailand, in which actors associated with higher educational institutions, i.e., university faculty (teacher educators) with pedagogical knowledge and skills, provide guidance and advice to lower-level students, and schools cooperate with the requests of teacher educators in a dedicated manner [38].

##### 4.1. Contributions to the Literature

Our findings can contribute to future research on the professional identity of teacher educators and advance research in this area. Previous studies on the professional identity of teacher educators have mainly conducted qualitative analyses on small samples to explore the relationship between the teaching practices of teacher educators and their professional identity. Lunenberg et al. [27] emphasized the fact that quantitative studies

with large samples are needed to generalize the results obtained in such studies to the entirety of teacher educators. A recent quantitative study conducted by Richter et al. [25] empirically revealed the association between teacher educators' professional identity and teaching practice. Specifically, this study showed that the more strongly aligned teacher educators' professional identities were with their role as "facilitators" who establish trusting relationships with teachers and support their skills and psychological growth, the more effective their teaching practices, according to the literature, including using active learning methods (such as group discussions) in their own courses, providing course participants with practical examples by using videos and mutual observation as teaching materials, and giving school teachers the opportunity to examine and study the learning process of their own students. Again, since the scale we developed is capable of assessing teacher educators' professional identity in terms of six more comprehensive dimensions, future research could use this scale to examine the relationship between teacher educators' professional identity and their teaching practices in greater detail.

This study can also contribute to research on the mechanisms underlying the development of teacher educators' professional identities. The formation of professional identity has been recognized as a central process in becoming a teacher educator [24]. Teacher educators' professional identity is believed to develop as they work and interact with colleagues, student teachers, and others who are involved in teacher education [22]. Furthermore, Dinkelman [23] noted that teacher educators' identities are formed over time, in context, and in practice. The measures developed in this study could be used in a quantitative study featuring a longitudinal design to examine the professional identities that teacher educators develop and the order in which they do so.

#### 4.2. Limitations

This study has several limitations. First, the sample for this study included teacher educators from three East Asian countries. Because the sample size for each country was small ( $n < 100$ ), we were unable to conduct cross-country invariance tests; however, in the future, we must confirm whether the six-dimensional model can be applied to each of the three countries. In addition, it is necessary for future studies to investigate whether the model can be generalized to samples from different cultures, such as Europe and the United States. Second, further research is needed to confirm the reliability and validity of the scale. To confirm face validity, one useful tool is to examine the relationship between the scale developed by Richter et al. [25], which consists of "facilitators" and "transmitters", and the scale developed in this study. Since "facilitators" are considered to correspond to "coaches" in this study and "transmitters" are considered to correspond to "teachers of teachers", we expect to observe positive correlations between these two pairs. If promising evidence regarding face validity is not obtained, it may be useful to revise the items radically and add new, more sophisticated items to the scale, e.g., by using cognitive interviewing techniques. Of the six professional identities measured by the scale developed in this study, the Cronbach's alpha coefficients curriculum developers and gatekeepers were somewhat low ( $\alpha = 0.51$  and  $0.59$ , respectively). Therefore, procedures to increase internal consistency by adding or removing items are needed.

#### 4.3. Summary

A recent study [25] that empirically explored the professional identity of teacher educators proposed that it should be conceptualized as featuring two dimensions. However, the work of Lunenberg et al. [27], which represents the most comprehensive review of research on teacher educators, proposed six dimensions of teacher educators' professional identity. In this study, items and a corresponding scale were developed according to the conceptualization of the six teacher educator roles proposed by Lunenberg et al. [27]. A questionnaire was administered to teacher educators in three Southeast Asian countries to collect quantitative data. The results of a confirmatory factor analysis supported our postulated six-factor model, indicating that teacher educators' professional identity can

be measured in terms of six dimensions. Future research can empirically analyze the relationship between professional identity and teaching practice by using the instrument developed in this study. Furthermore, the use of this scale in a study featuring a longitudinal design could elucidate the mechanisms underlying the development of teacher educators' professional identity.

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**Data Availability Statement:** The data supporting the findings of this study are openly available in OSF at <https://osf.io/58eaz/>.

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