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I. Introduction

The 21st Century is the age of globalization which is an ongoing process of intensifying economic, social, and cultural exchanges across the planet. Globalization is challenging schools everywhere and in multiple ways (Suárez-Orozco & Sattin, 2007). Students' daily contacts include individuals from diverse ethnic, gender, linguistic, racial, and socioeconomic backgrounds. Moreover, these students are experiencing some of history's most serious health problems, inequities between less-developed and more-developed nations, environmental deterioration, overpopulation, transnational migrations, ethnic nationalism, and the decline of the nation-state (Kirkwood, 2001). Therefore, regardless of their race and culture, students need to develop the attitudes, knowledge, and skills necessary to become competent, responsible, and humane citizens of their community. According to Hicks (2003), most adolescents also feel that it is important to learn about global issues at school in order to make better choices about how they might lead their lives.

Many previous studies, administrated in different countries, focused on examining youths' global knowledge, attitudes, interests, or perceptions (Asia Society, 2001;Giffin et al., 2002; Osunde, 1996; Pike et al., 1979; RoperASW for National Geographic Education Foundation, 2000; Zhao et al., 2006; Zhao et al., 2005).

These studies reveal similar findings that students' global knowledge and attitudes are insufficient. Hence, many scholars advocated schooling should create youths' abilities to interact effectively with people different and to take action in transforming structures of local and global oppression and inequity into ones that can bring about social and economic justice (Banks & Banks, 1995; Cushner, McClelland & Safford, 1992; Rennebohm-Franz, 1996; Sleeter, 1996; Wilson,1993; Zeichner, Grant, Gay, Gillette, Valli & Villegas, 1998). They also suggest that schools should adopt a global or international perspective in their curricula and that the school mission statement should include the goal that students gain a global perspective as an integral part of their education for citizenship in the 21st century (Grant, 1994; Lim, 2008; Solís-Gadea, 2010; Wilson, 1993).

Teachers' global competence has been considered as a key factor to decide whether schooling could be successful to prepare youths with a global perspective. If teachers are to teach with confidence from a global perspective, their general education and professional education programs must give them the tools to understand the connections between physiological, biological, ecological, social, and other worldwide systems (Hendrix, 1998). However, do teachers possess sufficient knowledge of relevant cultures, their beliefs, felt needs, histories, and political economies to be able to provide students with the necessary background information? Unfortunately, some scholars (Grant, 1992; Merryfield, 1991; Sleeter, 1992; Holden & Hicks, 2007) indicate that most of teachers have not been prepared to teach and to promote diversity, challenge inequities, or even recognize the effects of globalization in the lives of their students and communities. In order to improve teacher education, some researchers have studied teacher education in multicultural education, and have advocated for teacher education and professional development in global education (Dilworth, 1992; Garm & Karlsen, 2004; Grant, 1993; Larkin & Sleeter, 1995; Sleeter, 1992; Merryfield, 1995; Merryfield, Jarchow & Pickert, 1997; Pike & Selby, 1998; Tye & Tye, 1992; Wilson, 1993; Holden & Hicks, 2007). A number of scholars have worked to improve pre-service teacher

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education for diverse K-12 students (such as Bennett, 1995; Jordan, 1995; McDiarmid, 1992; Merryfield, 1996; Zeichner & Hoeff, 1996). Some scholars have made an effort to increase cross-cultural experiences within diverse populations in pre-service teacher education (such as Cushner & Mahon, 2002; Merryfield, 199; Sahin, 2008; Willard-Holt, 2001).

As part of the closely interconnected global system, Taiwan can not escape globalization's influences on educational innovation. Among relevant pieces of legislation, the revised University Law, the Teacher Education Act, and the Law of Teacher Union and Teacher Selection are thought to be particularly significant in restructuring the education system in Taiwan (Yang, 2002). According to the Administrative Guideline for Accreditation of Teacher Education Programs (Ministry of Education, 2002), universities are encouraged to build teacher training programs full of diverse characteristics. In order to respond the age of globalization, many universities offer multicultural education, environmental education, and information education, all of which are related to global education, in their teacher education programs. However, will these courses promote more global knowledge and abilities among pre-service teachers than among in-service teachers who were fostered by the old curriculum system, which lacked a response to globalization?

Along the same lines, pre-service teachers in Taiwan not only have to take 26 educational credits, but also take their major teaching courses. For secondary schools in Taiwan, these teaching fields include seven fields, including Language Arts, Health and Physical Education, Social Studies, Arts and Humanities, Mathematics, Sciences and Technology, and Integrative Activities. According to Merryfield (1995), global education demands knowledge from the sciences, history, the social sciences, and the humanities. Among the seven areas, the area of "Social Studies" is the most related to global education. If the pre-service teachers' majors and in-service teachers' teaching fields are related to the knowledge of global education, will they have better global knowledge and abilities? Do significant differences exist among various pre-service teachers' majors and in-service teachers' teaching fields in global knowledge and abilities?

Little empirical evidence has been provided to examine the possible degree of diversity in global knowledge and abilities between pre-service teachers and in-service teachers. In order to equip teachers with the core capabilities necessary to transform education theories to meet actual global education requirements, it is necessary to investigate teachers' global knowledge and abilities, to provide a basis for adjusting the pre-service teacher education program and in-service teacher training programs. Therefore, the present study used a questionnaire approach to investigate both pre-service teachers and in-service teacher's knowledge of global correlation systems, global issues, and cross-culture understanding, and global abilities. The following questions were explored: Are there significant differences between pre-service teachers and in-service teachers in their global knowledge and abilities? Are there any major differences in the perception of pre-service teachers with regard to their global knowledge and abilities? Are there any teaching field differences in the perception of in-service teachers with regard to their global knowledge and abilities? The finding of the present study could provide valuable information to teacher education and professional development in global education and could stimulate reflection on the program of global education in a teacher education program, not only those in Taiwan but in any society.

II. Methodology

a) Samples

The total subjects in the study were 537 teachers from two cohorts. There were 300 pre-service teachers from one large national university in central Taiwan. There, pre-service teachers were taking teacher education courses in the university, and therefore they had a dual identity, being both pre-service teachers and students. Of the pre-service teachers, 63% were female and 37% were male. The major composition of subjects was as follows: 56.7% of the pre-service samples were studying art-related majors including social studies, English, etc.; 43.3% were studying in science-related majors including math, biology etc.

The in-service teacher samples consisted of 237 secondary school teachers from central Taiwan, of whom 35.6% were male and 64.4% were female. Approximately 40.1% of them taught in the Language Arts teaching area, 16.0% in the Mathematics teaching area, 11.0% in the Social Studies teaching area, 4.2% in the Arts and Humanities teaching area, 17.3% in the Natural Sciences and life technology teaching area, 7.2% in the Health and Physical Education teaching area, and 4.2% of them in the Integrative Activities teaching area.

b) Instruments

Based on theories advanced in previous studies (Clarke, 2004; Hanvey, 1982; Hicks, 2003; Kniep, 1989; Merryfield, 2002; Pike & Selby, 1999; Tye & Tye, 1992), the author developed the questionnaire. With an additional review of global education, through factor analysis, teachers' global knowledge and abilities was categorized into four main categories with 40 items in total, including global correlation systems global issues, cross-culture understanding, and global abilities.

The questionnaire that was used consisted of 40 five-point Likert-scale items, the responses to which were coded as 1 = "know nothing" through 5 = "know a lot." Thirteen items (Scale I-global correlation systems) were intended to investigate students' and teachers'

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knowledge of the interdependency and correlation among politics, economy, ecosystem, environmental pollution, social change, sciences, technology, and universal systems. Fourteen items (Scale II- global issues) were intended to explore students' and teachers' knowledge of the international and controversial issues, such as technology, population, ethnicity, energy resources, food, ecological environment, health and hygiene, and globalism. Six items (Scale III- cross-culture understanding) were intended to investigate students' and teachers' understandings and appreciation of different cultural backgrounds, viewpoints, religions, history, and geography. Seven items (Scale V- global participatory) were intended to assess students' and teachers' global abilities, such as multiple views, interdependency, responsibilities, analysis and evaluation skills, creative skills, participatory abilities, and communication abilities. Individual item descriptions are given in Table 1.

Table 1 : Descriptions of items and independent t-tests for individual items between pre-service and in-service teachers' responses items

Item		*t*
Scale I –global correlation systems		
1.	political systems	1.19
2.	national organizations	1.53
3.	economic systems	1.35
4.	national trade, foreign investment and national rescue	.06
5.	planned economy, socialism economy, and free market economy	2.07*
6.	well-developed countries	4.44***
7.	revolutions of economic activities	2.75**
8.	distinguish between well-developed and developing nations	4.55***
9.	social problems	3.80***
10.	global information network	2.32*
11.	development of technology and information	1.84
12.	technological innovation and extension	2.58*
13.	influence of technological development	3.12**
Scale II –global issues		
14.	population migration	2.63**
15.	changing model and tendency of population structure	3.98***
16.	immigration and refugees	1.46
17.	prejudice and discrimination	2.02*
18.	areas, causes, and influences of global refugees	1.99*
19.	family plan	-.64
20.	application and influence of global resources	2.10*
21.	environmental influence caused by technology	2.82**
22.	oncoming issues	-1.31
23.	environmental issues	3.77***
24.	human right of races and gender	2.06*
25.	distribution of living resources	.58
26.	guarantee of basic rights	.88
27.	protection of basic rights	.72
Scale III –cross-culture understanding		
28.	physical geography states	1.58
29.	products and distributions	1.17
30.	the movements of global fusion and reform	1.36
31.	evolutions of religions	1.67
32.	religious cultures	1.11
33.	religious preach	2.36*
Scale V –global participatory		
34.	multiple cultural points	2.26*
35.	inspect own cultures	-.06
36.	revise prejudiced impressions	-.83
37.	discard country superiority	-3.17**
38.	against the stereotype, indifference, dogma	-3.21**
39.	international cooperative abilities and experience	.58
40.	participatory of international affair	.43

*p< .05. **p< .01. *** p< .001.

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Reliability coefficients within each scale were calculated both for the pre-service sample of teachers and for the in-service sample of teachers. The results are summarized in Table 2. For the pre-service sample, the reliability (Cronbach's alpha) for Scale I, II, III, V was .89, .89, .88 and .75, respectively. For the in-service sample, the reliability (Cronbach's alpha) for Scale I, II, III, V was .94, .89, .91 and .80, respectively. The overall reliability (Cronbach's alpha) for pre-service and in-service teachers was .94 and .96, respectively.

Table 2 : Cronbach's alpha values for the instrument

	Pre-service	In-service
Scale I –global correlation systems	.89	.94
Scale II –global issues	.89	.89
Scale III –cross-culture understanding	.88	.91
Scale V –global participatory	.75	.80
Composite (Item 1-40)	.94	.96

c) Data Processing and Analysis

Data analyses were performed using SPSS for Windows. Descriptive statistics, including mean and standard deviation, were used for data description. Scale scores were generated using the mean value of the items within each scale. Statistical tests included an independent sample t-test, ANOVA analysis, and Post hoc comparison. In order to understand the differences between pre-service and in-service teachers' awareness, subsequent statistical comparisons were made between pre-service and in-service teachers' scores. In addition, scores were used as the outcome variable to examine the major's effect on pre-service teachers' knowledge toward global correlation systems, global issues, cross-culture understanding, and global abilities, and the teaching field effect on in-service teachers' corresponding knowledge.

III. Results

a) Global Knowledge and Abilities Between Pre-Service and in-Service Teachers

The mean and standard deviation on the pre-service and in-service teachers' scale scores are listed in Table 3.

Table 3 : Descriptive information for Scale I, II, III and V scores and differences between pre-service and in-service teachers' scale scores

	Pre-service		In-service		*t*	*d*
	Mean	SD	Mean	SD		
Scale I –global correlation systems	3.51	.55	3.33	.67	3.43**	.29
Scale II –global issues	3.94	.51	3.83	.55	2.39*	.21
Scale III –cross-culture understanding	3.27	.69	3.15	.70	1.91	.17
Scale V –global participatory	3.48	.55	3.51	.56	-.79	.05

*p< .05. **p< .01.

A comparison of the scale scores of pre-service and in-service teachers was conducted. The results showed that pre-service teachers held a significantly higher score of global correlation systems and global issues than those of in-service teachers (t=3.43, p< .01, and t=2.83, p< .05, respectively). In addition, both pre-service and in-service teachers had a statistical difference in the score of cross-cultural understanding and global abilities (t = 1.91, p = .06, and t = -.79, p = .43, respectively).

In order to further investigate the differences in item responses between pre-service and in-service teachers, individual t-tests were administered on an item-by-item basis; the results are presented in Table 1. The significant results indicated that, first, pre-service teachers had a higher score on global correlation systems than that of in-service teachers in several items (e.g., Items 5, 6, 7. 8, 9, 10, 12, and 13). For example, pre-service teachers better understood the derivational social problems due to economic development (Item 9) and the positive and negative influence of technological development global systems bring on (Item 13). Pre-service teachers also had more knowledge to distinguish well-developed nations and developing nations (Item 8) and to understand the global information network (Item 10). Second, pre-service teachers also had more knowledge of global issues than did in-service teachers in some items (e.g., Items 14, 15, 17, 18, 20, 21, 23, and 24). For example, pre-service teachers better understood the issue of the changing model and tendency of population structure (Item 15) and the issue of the changing model and tendency of population structure (Item 23). Regarding global abilities, however, in-service teachers had better abilities than did pre-service teachers in two items. In-service teachers can discard the sense of individual and national superiority for the country's culture that falls behind one's own country (Item 37) and be a person who is against stereotype, indifference, and dogma (Item 38).

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Pre-service and in-service teachers' responses showed no differences in relation to other items (see Table 1). In eight of the thirteen items in Scale I, pre-service teachers were more knowledgeable of global systems than were in-service teachers. For Scale II, pre-service teachers had more knowledge than in-service teachers for eight of the fourteen items. In one of the six items in Scale III, pre-service teachers were more knowledgeable of cross-cultural understanding than were in-service teachers. For Scale V, in-service teachers had better abilities than pre-service teachers for two items but lower abilities for one of the items.

b) Global Knowledge and Abilities among Different Majors in Pre-Service Teachers

In order to examine the major effect on pre-service teachers' global knowledge, the scale scores of Scales I, II, III and V were used as dependent variables; the results are shown in Table 4. The relevant t-tests revealed that art-related pre-service teachers held significantly higher scores of global issues, cross-cultural understanding, and global abilities than did their science-related counterparts. In addition, statistically, there is no significant difference in global correlation systems between art-related in-service teachers and science-related in-service teachers.

Table 4 : Mean scores and standard deviations (in parentheses) by majors and t-values for major effect on scale scores

	Pre-service responses			
	Art-related	Science-related	*t*	*d*
Scale I –global correlation systems	3.55(.56)	3.47(.47)	1.16	.11
Scale II –global issues	4.03(.46)	3.81(.55)	3.75***	.31
Scale III –cross-culture understanding	3.45(.68)	3.04(.62)	5.30***	.45
Scale V –global participatory	3.61(.51)	3.30(.54)	5.20***	.42

*** p< .001.

After examining the major effect by t-tests, effect sizes were also calculated in order to examine the significance of scale-score differences between art-related and science-related teachers. The effect size for t-test is often described as Cohen's d. According to Cohen's rough characterization (1988, pp. 24–26), d = 0.2 is deemed to be a small effect size while a value of d = 0.5 is regarded as a medium effect size and d = 0.8 is considered to be a large effect size. It should be noted that when the standard deviations are not equal, the definition of d needs to be slightly modified. The results shown in Tables 3 and 4, which reached statistical significance by t-test, were viewed as having at least a small to medium effect size, indicating adequate practical significance for the difference investigated (Scale I and II in Table 3, Cohen's d = .29 and .21, respectively; Scale II, III, and V pre-service response in Table 4, Cohen's d =.31, .45, and .42, respectively).

c) Global Knowledge and Abilities Among Various Teaching Fields in in-Service Teachers

In order to examine the teaching field effect on in-service teachers' global knowledge, the scale scores of Scales I, II, III and V were used as dependent variables; the mean and standard deviation are shown in Table 5 and the results are shown in Table 6.

Table 5 : Mean scores and standard deviations (in parentheses) by various teaching fields

Teaching Field	Scale I	Scale II	Scale III	Scale V
Languages Arts	3.34(.67)	3.79(.51)	3.21(.68)	3.57(.54)
Mathematics	3.25(.70)	3.75 (.57)	2.81 (.77)	3.29(.54)
Social Studies	3.89(.49)	4.13 (.57)	3.67(.58)	3.76(.59)
Arts and Humanities	3.18(.49)	3.88(.55)	3.07(.69)	3.69(.69)
Sciences and Technology	3.31(.52)	3.91(.46)	3.18(.61)	3.49(.54)
Health and Physical Education	2.94(.59)	3.53 (.70)	2.82(.41)	3.21(.48)
Integrative Activities	3.11(.98)	3.81(.67)	3.12(.82)	3.57(.36)

Table 6 : Effects of teaching fields on in-service teachers and Post hoc comparison

source	SS	*df*	MS	*F* value	*Scheffé*
Scale I –global correlation systems					
Between groups	11.65	6	1.94	4.7***	3>1, 2, 6
Within groups	94.50	230	.41		
sum	106.15	236			
Scale II –global issues					
Between groups	4.53	6	.76	2.57*	3>6
Within groups	67.69	230	.29		
sum	72.22	236			

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Scale III –cross-culture understanding					
Between groups	13.56	6	2.26	5.11***	3>2, 6
Within groups	101.63	230	.44		
sum	115.18	236			
Scale V –global participatory					
Between groups	5.79	6	.97	3.26**	3>2, 6
Within groups	68.04	230	.30		
sum	73.83	236			

* $p < .05$. ** $p < .01$. *** $p < .001$.

Note : 1=languages arts; 2=mathematics; 3=social studies; 4=arts and humanities; 5=sciences and technology;
6=health and physical education; 7=integrative activities

The F-tests indicated that there were significant differences on Scale I, II, III, and V among various teaching field in in-service teachers ($F = 4.7$, $p < .001$, $F = 2.57$, $p < .05$, $F = 5.11$, $p < .001$, and $F = 3.26$, $p < .01$, respectively). As shown in Table 6, for Scale I, Scheffé tests revealed that in-service teachers teaching Social Science had higher score in global correlation systems than teachers teaching Languages and Literature, Mathematics, and Health and physical education. For Scale II, Scheffé tests revealed that in-service teachers teaching Social Sciences had higher score in global issues than teachers teaching Health and physical education. For Scale III, Scheffé tests revealed that in-service teachers teaching Social Sciences had higher scores in cross-cultural understanding than teachers teaching Mathematics and Health and physical education. For Scale V, Scheffé tests revealed that in-service teachers teaching Social Sciences had higher score in global abilities than teachers teaching Mathematics and Health and physical education.

IV. Discussion

a) *Difference in Knowledge of Global Correction System and Global Issues*

The purpose of this study was to examine global correlation systems, global issues, cross-culture understandings, and global abilities between pre-service teachers and in-service teachers. When examining the gap between pre-service and in-service teachers towards global knowledge, significant differences were found in that pre-service teachers held significantly more knowledge in global correlation systems and global issues than did in-service teachers. This statistical difference reached adequate significance when effect sizes were examined. This result was also confirmed by an item-by-item comparison of pre-service and in-service teachers' responses which showed that pre-service teachers had more knowledge of global correlation systems in eight of thirteen items and global issues in eight of fourteen items. In general, pre-service teachers might be able to learn the contents of environmental education and information education due to curriculum changes of teacher preparation program that facilitate pre-service teachers' understandings of global correlation systems and global issues. In contrast, in-service teachers were less able to do so because it might not have been emphasized in global education in the past.

However, some possible reasons for this difference include age, life style, educational opportunities, and climate of globalization. The average age for pre-service teachers is twenty years old. They are belonging to a new generation. New global realities increasingly define the contexts in which they are growing up, living, learning, loving, and working. Indeed, globalization in its various manifestations—economic, demographic, socio-cultural—is a quotidian part of the experience of pre-service teachers today. They might have better computer literacy, richer educational resources, and more opportunities to learn global correction system and global issues than in-service teachers. In contrast, most in-service teachers might be busy in their teaching jobs. If they have chances to arrange personal professional development, they might focus on learning the knowledge and skills in their teaching fields and might not be interested in learning global correction system and global issues.

However, the results of the present study also showed that there is room for in-service teachers to recognize how necessary global knowledge in nowadays while they're teaching; therefore, more training programs with carefully designed global education are necessary for facilitating in-service teachers' global correlation system and global issues.

In contrast to global correction system and global issues, within Scale I and II, in Scale V, the items for which in-service teachers had more abilities than pre-service teachers were Item 37 (discard country superiority) and 38 (against stereotype, indifference, and dogma). This might be due to the in-service teachers' relatively greater teaching experience and communication abilities, which might lead to more understanding and appreciation for others. The result suggests that teacher education programs should increase pre-service teachers' communication knowledge and skills, as well as greater understanding and experience in different cultures.

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b) Difference in Global Knowledge and Abilities among Majors and Teaching Fields

When the major's effect was considered for each scale-wise, t-tests showed medium effect sizes in the pre-service teacher sample, and that art-related pre-service teachers held significantly higher scores in global issues, cross-cultural understanding, and global abilities than did their science-related counterparts. The item-by-item major-effect analysis provided more information to illustrate the points above. For example, art-related pre-service teachers held higher scores in the global issues such as oncoming issues, environmental issues, distribution of living resources (Item 22, 23, and 25), human rights of race and gender, and guarantee and protection of basic rights (Item 26 and 27). In addition, art-related pre-service teachers showed more understanding and appreciation of different cultural backgrounds, viewpoints, religions, history, and geography (Item 28-33) as compared to science-related pre-service teachers. According to Merryfield (1995), global education demands knowledge from social studies, and the humanities. Because most of the art-related pre-service teachers came from geography and English majors, this finding concurs with Scholz's (1990) research finding. Scholz's study investigates the effects of pre-service education on the global understanding of elementary education majors, and the attitudes and classroom practice of selected elementary teachers. The results indicated those teachers who had studied global education as undergraduates felt more positively about including it in the curriculum. The art-related pre-service teachers in this study might be more knowledgeable and comfortable in discussing global issues, understanding cross-cultural diversities and participating global affairs, while science-related pre-service teachers might be less knowledgeable in their learning and daily life.

Scale-wise, teaching field differences were also found in the in-service teacher sample on the scale of global correlation system, global issues, cross-cultural understanding, and global abilities. Overall, the results indicated that there were significant differences on Scale I, II, III, and V among various teaching fields in in-service teachers. Social studies teachers were more aware of global perceptions than teachers in other teaching fields-- in particular, math teachers and health and physical education teachers. As mentioned above, global education demands knowledge from social studies (Merryfield, 1995). The social studies teachers accepted more training and experiences related to global education than teachers in other fields.

Social studies teachers were therefore more able to recognize the importance of global education in classroom practices. If in-service teachers of other teaching fields could be provided with more global knowledge, skills, experiences and appreciation, then it may be possible that their students would benefit from their teaching and then students' attitudes might also improve. However, the effect and the influence of global education which was delivered by the teachers still needs further validation by future research.

Based on the above, these significant major and teaching field differences can be observed in both pre-service and in-service samples of teachers, and reveal a quite interesting phenomenon suggesting that art-related and social studies teachers, regardless of their pre-service or in-service status, held even higher perceptions towards global knowledge and global abilities.

V. Conclusions

Today youths experience most serious health problems, inequities among nations, environmental deterioration, overpopulation transnational migrations, ethnic nationalism, and the decline of the nation-state. These changes are creating a need to acquire a global education. If teachers are to teach with confidence from a global perspective, their general education and professional education programs must give them the tools to understand the connections between physiological, biological, ecological, social, and other worldwide systems. The present study has explored the global knowledge and abilities of both pre-service teachers and in-service teachers. Our results showed that pre-service had more global knowledge than did in-service teachers in general. Major played a role in pre-service teachers' responses and teaching field played a role in in-service teachers' responses about global knowledge in general—where the subject of social studies had higher score in both cases. Future research needs to be undertaken in order to develop ways to enhance science-related pre-service teachers' understanding and appreciation towards global issues and to increase concerns for in-service teachers of other teaching fields to apply the notion of globalization as an interface for global education. Moreover, the present study only involved one measure of teachers' global knowledge and abilities. The future research could consider to apply other measures (e.g., classroom observation of curriculum design and implementation related to global education) to acquire more evidences regarding teachers; global knowledge and abilities.

The findings of the present study could contribute to recent calls for more evidence of the effects of teacher education program in global education and suggest teacher educators create suitable systems that would enhance prospective teachers' global knowledge and abilities. When teachers attain adequate global knowledge and positive attitudes, they are prepared for teaching the future global citizenship. In contrast, if teachers lack of global knowledge and attitude, it is difficult for them to arrange global education.

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