

MAKING INTERNATIONAL EXPERIENCES ACCESSIBLE TO IN-SERVICE TEACHERS THROUGH EAST MEETS WEST PROGRAM

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Abstract

The goal of this study was to examine the impact of the integration of global experiences on in-service teachers' international perspectives in mathematics classroom teaching through offering a graduate course "Global Perspectives in Mathematics Teaching" in the form of the East Meets West Program. This program engages teachers in an interactive face-to-face learning process in a dual language immersion setting. The opportunity of learning effective teaching strategies from Chinese top-ranked mathematics teachers and applying these strategies in teaching mathematics by working with a group of Chinese and US children in the East Meets West Program has benefited classroom teachers in various ways. The results of the study show that observing Chinese teachers' mathematics lessons, doing the case study on student learning, and observing and discussing the US colleagues' mathematics lessons highly have benefited them as classroom teachers.

Keywords: global perspectives, mathematics education, internationalization of teacher education, children learning, fieldwork

The internationalization of teacher education has long been an interest of instructors of education programs in the US (Klassen, 1972). It provides opportunities for sharing, discussing, questioning their own teaching practices, and finding the better choices in constructing the teaching process (Stigler & Hiebert, 1999). Therefore, it is imperative to engage U.S. teachers in learning instructional strategies with international perspectives and applying the strategies in classroom teaching. However, "while the

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tremendous influence of globalization, the interconnectedness of economies, and the importance of intercultural communication have been clear for some time, too little attention has been given to the question of how to make curriculum more reflective of international dimensions and concomitantly how to insure that we have more internationally competent teachers” (Koziol, Greenberg, Williams, Niehaus, & Jacobson, 2011, p.2). According to Knight (n.d), the internationalization of university general education curriculum is the process of integrating international, intercultural or global dimensions into the purpose, functions or delivery of post-secondary education. This definition emphasizes the importance and ways of integration of internationalization in teacher education programs (NAFSA Report, 2012).

With the increased growth of diverse student populations in urban areas, it is important to integrate international perspectives in mathematics teacher education programs in urban universities because international assessments from TIMSS (1999 & 2007) and PISA (2010 & 2102) revealed that the disparity between U.S. students’ mathematics achievement and those from other countries has not improved. In contrast, four Asian countries are among the top groups in mathematics scores in these international assessments. To improve the US student mathematics learning, teachers’ knowledge must be improved (An, Kulm, & Wu, 2004; An, 2004; Ma, 1999), and the international perspectives in mathematics classroom teaching must be introduced because it often leads mathematics educators to develop a deep understanding of various aspects of mathematics teaching and learning and it promotes teachers to question their own teaching practices and to develop better strategies in the teaching process (An, 2004; National Mathematics Advisory Panel Report [NMAPR], 2008; Stigler & Perry, 1988). However, there has been little discussion on the internationalization of mathematics teacher education in urban areas (Wu, Wei, An, McCoy, & Serrano, 2012).

The purpose of this study was to examine the impact of the integration of international experiences into a graduate mathematics education course on in-service teachers’ international perspectives in mathematics classroom teaching. Specifically, this study examined the impact of the East Meets West Program which was integrated into a graduate course and made international experiences accessible to in-service teachers (graduates) through engaging them in an interactive face-to-face learning process with two groups of teachers and children from China and the US in a dual language immersion setting. This study sought to answer the following research questions:

1. What are the learning experiences of in-service teachers in the East West Program?
2. What is the impact of working with colleagues on the in-service teachers’ perceptions of the East Meets West Program?
3. What do the in-service teachers learn in terms of the differences between the US and China in children’s learning?

Conceptual Framework

The conceptual framework in this study first discussed the needs for international perspectives in mathematics education in general and then discussed the needs for improving mathematics teaching and learning in urban areas specifically. Next, a brief discussion further framed the methods of internationalization of teacher education and

indicated how the methods of internationalization were applied in the East Meets West Programs.

Needs for International Perspectives in Mathematics Education

According to Reimers (2009) “the educational paradox of the beginning of the twenty-first century lies in the disconnect between the superb institutional capacity of schools and their underperformance in preparing students to invent a future that appropriately addresses the global challenges and opportunities shared with their fellow world citizens” (p. 183). This paradox also exists in mathematics education. In recent years, despite the fact that various comparative studies have revealed notable differences between the US and China in math teachers’ knowledge (An, Kulm, & Wu, 2004; An, 2004; Ma, 1999), we have learned little about ways to improve mathematics instruction in real classrooms (NMAPR, 2008; Stigler & Hiebert, 1999; Wu & An, 2007).

In general, the US has viewed Asian countries, especially China, as having a superior mathematics educational system (Schleicher, 2014). Recent evidence from international assessments in TIMSS 1999 and 2007 revealed the disparity in students’ mathematics achievement between the US and other countries. In the recent PISA2012, US students’ mathematics average score of 481 was still below average among the 34 OECD member countries and 31 partner countries (494), as in previous years. In contrast, five Asian countries (Shanghai-China, Singapore, Hong Kong-China, Taiwan, and South Korea) were among the top groups in mathematics scores according to the results of PISA2012 (Organization for Economic Co-operation and Development, 2014). To understand why this is and what are vital in making students’ learning successful, and to prepare students for global competence, mathematics teaching in the US would benefit by examining international mathematics education practices and integrating such international perspectives into mathematics classroom teaching (National Center for Education Statistics, 1999; NMAPR, 2008; Stigler & Hiebert, 1999).

Needs for Improving Mathematics Teaching and Learning in Urban Areas

In several urban areas in the US, such as California, math, science, and reading achievement levels of public school students in grades 4 and 8 as assessed by the *National Assessment of Educational Progress* (NAEP) have been below the national level in recent years (National Center for Education Statistics, 2013). According to the 2013 NAEP, in California, average score gaps in NAEP mathematics for White and Hispanic fourth- and eighth-grade public school students are wider than the national level. The recent international, national and local assessment results also show that a significant achievement gap continues to exist for African American, Hispanic/Latino, low-income, and English-learner students in urban areas, compared to their peers (Orfield, Losen, Wald, & Swanson, 2004). Assessments indicate that struggling students have a limited understanding of basic mathematics concepts and they show underachievement in the application of mathematical skills to solve even simple problems (NRC, 2001).

Research on teachers’ knowledge indicates that many of the difficulties students have in learning mathematics are attributed to teachers’ own fragile understandings of math (Dreyfus, 1999; Harel & Rabin, 2010). There is widespread agreement that teachers

need to develop profound mathematics content knowledge and pedagogical content knowledge in mathematics (Ma, 1999; An, Kulm, & Wu, 2004). Although many professional development programs have sought to improve teacher's knowledge and related teaching practice, little progress has been made in improving classroom teachers' knowledge and in effectively supporting struggling student mathematics learning. Further, the implementation of the Common Core State Standards has placed even greater emphasis on developing a deeper, more cognitive (less rote) understanding of mathematics concepts among students (Porter, McMaken, Hwang, & Yang, 2011). Teachers must be given an opportunity to learn different perspectives in teaching and learning mathematics (An, Kulm, & Wu, 2004; Ma, 1999), especially to learn teaching strategies from the countries that had higher mathematics achievements in the international assessments (Wu, Wei, An, McCoy, & Serrano, 2012).

Methods of Internationalization of Teacher Education for the Global Age

According to Moss (2012), many teachers are ready to face the challenge of educating for global competence, but others feel less prepared. The US Department of Education has made broader global skills for college students a priority - to make global competency a benchmark in learning for today's students (Fisher, 2012). To achieve this goal, it is vital to provide global learning opportunities and related courses in teacher education programs to develop successful teacher candidates with global competency, and much work still needs to be done at institutions across the country. Basic to their development are these elements (Moss, 2012):

- Coursework that has integrated global competence into both content and pedagogical development.
- Clinic and field placements in schools that model effective global education.
- Professors and mentors who value global competence and seek out global contexts in all aspects of the teacher preparation curriculum.
- Application of theories of cross-cultural learning, communication and adjustment across the program.
- Learning about other regions of the world and global current events.
- Reflection on one's own culture and its impact on daily choices and classroom practice.
- Opportunities for experiential learning in other countries and cultures through study abroad, teaching practicums, and/or internships (p.4).

Background of the Study: Description of Globalizing Instruction in Mathematics Education

The main elements of internationalization of teacher education that was addressed by Moss (2012), such as coursework, field placements, mentors, application, learning and reflection, are the main approaches in this study (See Figure 1).

Course work: Global perspectives in mathematics teaching. To help classroom teachers develop a deep understanding of mathematics teaching and learning from a

different perspective, in 2009, we developed a graduate course with international perspectives in mathematics education: Global Perspectives in Mathematics Teaching. The main objective for this course was to develop global perspectives in mathematics teaching by engaging graduate students in exploring, analyzing, and applying multifaceted teaching approaches from different cultural and educational systems.

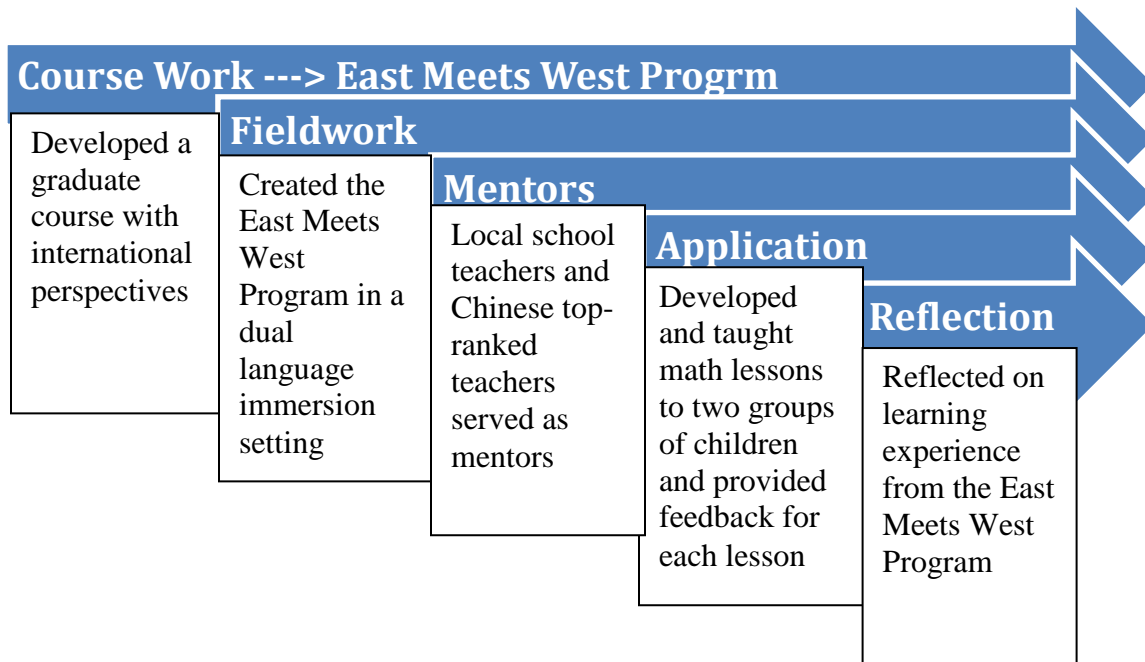


Figure 1. The process of internationalization of math education courses in East Meets West Program.

Fieldwork: East Meets West Program. With the support of the Incentive Award to Globalize Education by the University, we created the East Meets West Program (EMW), focusing on globalizing and modifying instruction with a concrete international perspective and experience in a graduate course in 2010. The general purpose of this program was to integrate a mathematics education graduate course in the Summer Teacher Institute which provided a unique opportunity to classroom teachers. The specific goals of this program were to provide children and classroom teachers an opportunity to experience different cultures and educational systems, and to promote their global awareness in a first-hand experience. In the East Meets West Program, graduates worked together with local school teachers and Chinese teachers to provide integrated language, mathematics, science, social science, and physical education for children from both China and the US through a series of creative cultural hands-on activities, integrated and innovative lessons, and field trips.

Mentors. In the East Meets Program, the selected local school teachers played the mentor roles to support the classroom teachers' learning and understanding of international perspectives in teaching and learning mathematics. The local school teachers all had opportunities for experiential learning in China through the international exchange and attending the international conferences in the recent few years so they were able to share their experience of global competence in the mathematics teaching practice with the graduate students.

Application. The graduate students had an opportunities work with their grade level peers to develop and teach a series of interactive, fun, and real life related mathematics lessons to two groups of children. They observed and provided constructive feedback for each lesson taught by their peers. The graduate students also conducted a case study on comparing differences in student learning between the two groups of children from working with them and observing their learning.

Reflection. The graduate students reflected on their learning on a daily basis by talking and sharing their experiences when preparing for the next day's activities. They also reflected on their learning in their post-survey at the end of the East Meets West Program.

2010 East Meets West Program. A graduate course was integrated with the East Meets West Program for a group of Chinese and US children as a piloted project in summer 2010. It brought 21 Chinese children from an elementary school in Nanjing, China to interact with 21 US children from their sister school in an urban city in Southern California. The two groups of children were paired up and worked together for a weeklong East Meets West Program. It involved nine K-12 classroom teachers and four graduates from the mathematics education program, as well as more than 20 college and high school student volunteers. Because of the successful experience, children from both China and US participated in this program again in summer 2011.

2011 East Meets West Program. Based on the experience from summer 2010, the summer course Global Perspectives in Mathematics Teaching was integrated with the East Meets West Program for Chinese and US children groups in summer 2011. Along with a group of local school teachers, 24 graduate students in the mathematics education program designed a set of mathematics lesson plans, taught these children for a week, and did a case study on comparing student learning from two groups.

The East Meets West Program has provided our graduate students with rich experiences on how to teach and learn mathematic effectively with international perspectives via face-to-face with international colleagues.

Methods

Participants

In 2011 summer, 38 children from an elementary school in the US (18 children at grades 4-5) and an elementary school in China (20 children at grades 4-6) participated in a weeklong East Meets West Program. Both groups of children were recruited on a

volunteer basis. Twenty-four in-service teachers were graduate students in the mathematics education program and they participated in this program along with five teachers from local school districts in an urban area in Southern California and teachers from China. Out of the 24 teachers, 10 were elementary teachers, 10 were middle school teachers, and four were high school teachers with 19 being full-time and 5 part-time (substitute teachers). Their teaching experiences ranged from 4 years to 21 years.

Procedures of 2011 East Meets West Program

The graduate students worked with the five local school teachers to develop the curriculum and activities for the East Meets West Program. They attended planning and scheduling meetings, designed and taught a series of hands-on, fun, innovative, and interactive SDAIE (Specially Designed Academics in English) mathematics lessons for both Chinese and US children in a dual language setting. For example, a fifth grade teacher taught a lesson on percentages using the actual Target store flyers that show the original price and percent of discount; students were asked to figure out what, how, and why to buy merchandise while working together with their partners, which paired one US and one Chinese student. The graduate students also went with the children on fieldtrips to experience real world mathematics and science applications, and observed how the two groups of children learn mathematics differently for the case studies they developed. In addition, they observed not only local school teachers' mathematics, science, and English integrated lessons, but also observed mathematics lessons taught by Chinese teachers and had discussions with them about their effective teaching. In addition, they evaluated their peers' instruction by providing constructive feedback for each lesson. As a result, 10 graduates presented their learning experience from the East Meets West Program at the

National Association for Asian and Pacific American Education Conference (NAAPAE) in Long Beach during fall 2011, and two graduates co-presented a study on the East Meets West Program with faculty members at the 12 International Congress on Mathematical Education (ICME 12) conference in Seoul during summer 2012.

Learning teaching with international perspectives. Four Chinese teachers came with their students from an elementary school in China. A top rank Chinese math teacher taught a mathematics lesson to both groups of children for the US classroom teachers and graduate students. This provided the US classroom teachers and graduate students an opportunity to watch and learn how Chinese mathematics teachers teach mathematics and provided them a chance to interact and discuss effective teaching face-to-face with Chinese teachers. The graduate students also watched four video Chinese mathematics lessons prior to actually meeting the Chinese teachers and analyzed effective teaching strategies.

Curriculum design and field experience in a dual language immersion setting. The US classroom teachers and graduate students designed and taught six hands-on, fun, innovative, and interactive math lessons to the two groups of children in a dual language immersion setting. For example, a group of graduate students taught a lesson on percentages using the actual Target store flyers. Children worked with the group to figure

out what, how, and why to buy merchandise. The graduate students evaluated each other's teaching using the daily evaluation log, got feedback from Chinese teachers, and also wrote a reflection on their teaching and learning experience from the East Meets West Program.

Case study. The graduates conducted a case study on comparing how children learn mathematics differently from field observations and interactions with the two groups of children. They were required to observe and work with two children, one Chinese child and one US child, and develop a case study to identify and analyze differences or similarities in their mathematics learning: differences in conceptual understanding between Chinese and US children, differences in procedural or computational fluency between two groups, differences in problem solving in real world or word problems between the two groups, and differences in disposition toward mathematics learning. Their report includes analyzing the differences or similarities in these four areas, discussing implications in teaching and learning, and reflecting on their learning from doing this case study.

Data Collection and Instruments

Surveys. Pre- and Post-Surveys were provided to the classroom teachers and graduate students. The graduate student pre-survey consisted of 12 questions and post-survey included 27 questions. The goals of the graduate student surveys were to identify the effects of their learning on global perspectives in mathematics education from working with children in the East Meets West Program, and identify the relationships between various approaches in the East Meets West Program and its impact on the teachers' views and their future plan for their professional development.

Lesson evaluation and reflection. The graduate students engaged in self- and peer evaluation activities. Their daily teaching evaluation logs and reflections on their learning were collected.

Lesson plans and video lessons. The graduate students' lesson plans were collected. All lessons in the East Meets West Program were videotaped for data analysis purposes.

Data Analysis

This study only used the graduate students' surveys in the data analysis. Both qualitative and quantitative research methods were employed in the data analysis of the surveys. Quantitative methods were used for analyzing the questions 1-14: Descriptive statistics were used for the 5-point *Likert items* in the surveys to compare the differences in the participants' responses on their learning from observing and discussing Ms. Jin's mathematics lesson (Q1) and the US colleagues' six mathematics lessons (Q2), watching and discussing Chinese mathematics video lessons (Q3), presenting the group lessons to children (Q5), doing the case study with the two groups of children (Q8), and participating in the East Meets West events (Q9); correlation tests were used to identify the

relationships between various approaches in the East Meets West Program, such as working with peers on group lessons (Q4), providing and getting feedback from colleagues on their group lessons (Q6), discussing mathematics teaching with their colleagues (Q10), planning their mathematics lessons with colleagues together (Q11), observing their colleagues' lessons (12), being observed by their colleagues (Q13), and having the lesson study activity at their school or district (Q14) and the impact of these activities on the teachers' views and their future plan for their professional development.

Qualitative data analysis was used for analyzing the open-ended questions on their learning from working with the two groups of children in their case study in the surveys. The open-ended question used in the pre-survey was "In this class, you will have an opportunity work with both Chinese and US children in mathematics. What do you expect to gain the most from this activity? Why?" The open-ended question used in the post-survey was "What did you learn from observing children learning and working with them in East Meets West Program?" The analysis first identified the frequency and compared the differences of the teachers' observation on two groups of children mentioned in both surveys in five main components: Disposition, interaction, learning, teaching, and curriculum. Based on analysis of the differences in teachers' expected learning and their real learning in these five components between the pre-survey and post-survey, the analysis then focused on three main areas of children learning, children disposition, and children interaction to further identify teachers' learning from the case study.

Results

The results of the data analysis revealed the important influences of the East Meets West Program on the classroom teachers' views on teaching and learning, and showed some relationships between these influences.

Knowledge and Skills

Table 1 shows that the graduate students highly recognized that their participation in the East Meets West Program benefited them as classroom teachers, which had a highest mean score ($M = 4.87$, $SD = .352$), followed by the second highest mean score indicating that watching the video lessons benefited them as classroom teachers ($M = 4.73$, $SD = .458$). They also stated their learning from the observation of Ms. Jin's Chinese mathematics lesson ($M = 4.60$, $SD = .828$), and highly stated that their teaching to the two groups of children benefited them as classroom teachers ($M = 4.53$, $SD = .915$). In addition, all graduates really enjoyed the observation of their peers' six mathematics lessons ($M = 4.67$, $SD = .488$).

Table 2 shows the benefits of the East Meets West Program to the classroom teachers from working with their peers on group lessons ($M = 4.40$, $SD = 1.121$), from feedback by their colleagues on their group lessons ($M = 4.40$, $SD = .737$), on their willingness of planning mathematics lessons together with their colleagues ($M = 4.40$, $SD = 1.056$), observing their colleagues' lessons if there is an opportunity ($M = 4.60$, $SD = .910$), being observed by their colleagues and discussing about their lessons ($M = 4.33$, SD

= 1.113), and having the lesson study activity at their school or district ($M = 4.33$, $SD = .900$).

Table 1
Descriptive Statistics

Questions	<i>M</i>	<i>SD</i>	<i>N</i>
Q1. How did the observation of Ms. Jin's math lesson and discussion benefit you as a classroom teacher?	4.60	.828	15
Q2. How did the observation of your US colleagues' six math lessons and discussion benefit you as a classroom teacher?	4.67	.488	15
Q3. How did watching Chinese math video lessons and discussion benefit you as a classroom teacher?	4.73	.458	15
Q5. How did presentation of your group lesson to children benefit you as a classroom teacher?	4.53	.915	15
Q8. How did the case study benefit you as a classroom teacher?	4.40	.737	15
Q9. How did your participation in the East Meets West events benefit you as a classroom teacher?	4.87	.352	15

Table 2
Descriptive Statistics

Questions	<i>M</i>	<i>SD</i>	<i>N</i>
Q4. How did working with peers on group lesson benefit you as a classroom teacher?	4.40	1.121	15
Q6. How did feedback from your colleagues on your group lesson benefit you as a classroom teacher?	4.40	.737	15
Q10. Would you like to discuss math teaching with your colleagues?	4.40	1.056	15
Q11. Would you like to plan math lessons with your colleagues together?	4.40	1.056	15
Q12. Would you like to observe your colleagues' lessons if there is an opportunity?	4.60	.910	15
Q13. Would you like to be observed by your colleagues and discuss about your lessons?	4.33	1.113	15
Q14. Would you like to have the lesson study activity at your school or district?	4.33	.900	15

Impact on Working with Colleagues

Table 3 shows three strong correlations and one medium correlation between the teachers' responses based on Cohen's correlation strength test (1988). The strong correlations are: "The observation and discussion of Ms. Jin's mathematics lesson benefit you as a classroom teacher" is highly associated with "How did the case study benefit you as a classroom teacher?" ($r = .7632$, $p = .011$); "How did the observation and discussion of your US colleagues' six mathematics lessons benefit you as a classroom teacher?" is highly associated with "How did presentation of your group lesson to children benefit you as a classroom teacher?" ($r = .7602$, $p = .008$); "How did the observation and discussion of your US colleagues' six mathematics lessons benefit you as a classroom teacher?" is

highly associated with “How did your participation in the East Meets West events benefit you as a classroom teacher?” ($r = .500, p = .035$). The medium correlation is: “How did presentation of your group lesson to children benefit you as a classroom teacher?” is associated with “How did your participation in the East Meets West events benefit you as a classroom teacher?” ($r = .476, p = .046$).

Table 3
Correlation

Variable	q1	q2	q3	q5	q8	q9
q1	1					
q2	-.158	1				
q3	.222	-.175	1			
q5	.602**	.095	.159	1		
q8	.632*	-.199	.339	.402	1	
q9	-.158	.500*	-.219	.476*	-.055	1
N	18	18	18	18	15	18

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Results from Table 4 show 14 strong correlations between the teachers’ responses based on Cohen's correlation strength test (1988). The strongest correlations, shown in Table 3, are feedback from the colleagues on their group lessons and discussing mathematics teaching with their colleagues ($r = .790, p = .000$); feedback from the colleagues on their group lessons and willingness to observe their colleagues’ lesson if there is an opportunity ($r = .788, p = .000$); willingness to be observed by their colleagues and discussion about their lessons is highly associated with willingness to have the lesson study activity at their school or district ($r = .783, p = .000$).

Table 4
Correlations

Variable	q4	q6	q10	q11	q12	q13	14
q4	1						
q6	.484	1					
q10	.419	.790**	1				
q11	.653**	.422	.455	1			
q12	.562*	.788**	.653**	.674**	1		
q13	.401	.697**	.715**	.553*	.674**	1	
14	.272	.539*	.626**	.619**	.451	.783**	1
N	18	15	18	18	17	17	18

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Awareness of Differences between Two Groups of Children from the Case Study

The graduates conducted a case study on comparing how children learn mathematics differently from the field observations and interactions with the two groups of children in the East Meets West Program. The data analysis focused on their learning from the case study addressed in their surveys. Table 1 shows the graduate students' overall learning from the case study ($M = 4.40$, $SD = .737$). The results of analyzing the surveys on their learning from working with children from the two groups show some changes on their views between the pre- and post-surveys. Table 5 shows the frequency and differences of the teachers' observations on two groups of children mentioned in both surveys:

Table 5
Differences in Learning from Working with Two Groups of Children

	Pre-Survey: In this class, you will have an opportunity work with both Chinese and US children in mathematics. What do you expect to gain the most from this activity? Why?	Post-Survey: What did you learn from observing children learning and working with them in East Meets West Program?
Disposition	4	8
Interaction	4	10
Learning	13	9
Teaching	4	4
Curriculum	1	

The results of Table 5 show differences in teachers' expected learning and their real learning between the pre-survey and post-survey. Before working with the two groups of children, they expected to gain the most on children's learning mathematics ($n = 13$), very little on other areas. For example, the frequency of disposition was 4 and the frequency of interaction was 4 compared to 13 in children learning in their pre-survey. However, after they had an opportunity working with the two groups of children, they indicated that their learning occurred beyond just children's learning mathematics ($n = 9$), but also the children's disposition ($n = 8$), and their interaction ($n = 10$) with children of different cultures. Based on the comparing the differences in the frequencies, the following areas were identified as the main learning areas identified by the classroom teachers in the East Meets West Programs.

Children learning. The US teachers observed many differences in student learning between the two groups of children. The following two are the main differences based on their views. The first interesting difference in student learning is student attentiveness. Melissa, a 5th grade teacher, indicated:

I noticed that the Chinese students are very attentive to everything the teacher is saying, showing, and modeling for them, which the American students lack most of the time. Attention to details in a classroom is very important because it leaves

little room for confusion for the students and the teacher is free to mingle in the classroom assisting or formally assessing students' learning on the content.

The second difference in student learning is computation and reasoning, noticed by Jerry, a middle school teacher. He said:

From observing both groups of students, I was able to see and understand that the Chinese students use a lot of mental math to come up with answers whereas the American students always use paper and pencil to calculate their answer. I was amazed at the accuracy of the Chinese students' answers and their confidence level of explaining their answers. The American students here are content with just giving an answer to a question whereas the Chinese students give an answer but justify their answer to give the teacher an idea of how the student came up with his or her answer.

Melissa and Jerry's observations on children learning show that Chinese children's learning is different from the US children's learning in a number of respects: attentiveness, mental math, accuracy, and justify the answers. These differences suggest the gaps in children learning between the two groups.

Children disposition. The notable difference in student disposition observed by the US teachers was addressed by Karen, a high school teacher, "I was impressed by the students' motivation and respectfulness. Being a high school teacher I work daily with difficult students." Jessica, an elementary teacher addressed the same challenge in comparing the Chinese children with their US counterparts, "Students from China are very disciplined and respectful when participating in class. American students are more impatient and need to be active." Liz, an elementary teacher also addressed the same observation and concern, "I feel that students have a better respect for their teachers in China, perhaps because the teaching profession is more respected there. I also feel like Chinese students are more disciplined and focused in the classroom than American students. Chinese students have amazing mental math skills which American students lack." However, Diana, a high school teacher agreed Karen and Jessica's comments, but indicated the influence from the Chinese peers on the US children, "How well mannered, respectful and disciplined the Chinese students are. I feel this is very helpful to them in obtaining their education. The Chinese listened to their teacher during listening time and did their practice during practice time. The US students seemed very interested in their Chinese peers and seemed to follow their example of respect. The US students seemed to enjoy the lessons. I think the students from both countries enjoyed observing each other." Diana's observation shows that the children from both groups were able to observe, learn, and influence each other in the East Meets West Program.

Children interaction. All the classroom teachers observed the active interaction among children between the two groups. For example, Robert said, "By observing children learning and participating in the East Meets West Program, I learned that both groups of students were very well receptive of one another. Students were helping each other out during lessons to ensure their partner was not lost or confused. Even though the

students did know the language, depending of the langue of the lesson, the students very learning and doing by watching the teachers and their classmates.” The teachers realized that “children, when not influenced by adults, are alike all over the world. They all enjoy interaction and sharing,” and they also understood that “regardless of a language barrier that children will find ways to communicate, interact, have fun, and help one another.” Andrew indicated, “As I valued the experience in East Meets West Program, I saw children loving one another as friends not be hindered by language at all. I saw that both US and Chinese children greatly valued the time spending together learning and having fun in this program.” These teachers’ observations on the children’s interaction show that children are more likely to be involved, interacted, and communicated regardless of the language barrier if they are given an opportunity to be together and participating in well-designed meaningful activities like the East Meets West Program. Overall, as indicated by the classroom teachers in their reflections, “the East Meets West learning experience for the graduate students, the Chinese students, and the US students was an opportunity of a lifetime. All of us are walking with a much appreciation of each other and their cultural values.” It was an eye-opening experience for observing student learning in different cultures.

Discussion

The results of this study show that participation in the East Meets West Program has broadened the graduate students’ views on how different cultures and educational systems teach and learn mathematics in different ways, and how children from different cultures and educational systems possess varied dispositions. Children from different cultures and educational systems can work together very well if an opportunity is provided. The results of this study also show that it is possible to make international experiences accessible to all in-service teachers (graduates) through offering an appropriate in-service teacher education course on global perspectives in mathematics teaching, and by engaging the in-service teachers in an interactive face-to-face learning process in a dual language immersion setting in urban area. The opportunity of learning effective teaching strategies from Chinese top ranked mathematics teachers and applying these strategies in teaching mathematics by working with a group of Chinese and US children in the Summer Teacher Institute - East Meets West Program has benefited classroom teachers in various ways according to this study.

Internationalization of Mathematics Education

This study shows the benefits of the internationalization of mathematics education as addressed in Table 3. There were strong associations between the East Meets West activities that benefit them as classroom teachers, such as the association between observing and discussing the Chinese teachers’ mathematics lessons and conducting the case study with the two groups of children, and the association between observing and discussing their US colleagues’ mathematics lessons and their participation in the East Meets West Program. Prior studies have noted the importance of the internationalization of mathematics education that provides the classroom teachers opportunities for sharing,

discussing, questioning, and reflecting on their own teaching practices, and identifying the better strategies in developing their teaching process (Stigler & Hiebert, 1999).

The important findings in this study were that the classroom teachers identified some differences in children learning between the US and China: attentiveness, mental math, accuracy, and justify the answers. These differences not only address the gaps between the US and Chinese children learning, but also are consistent with the new Common Core State Standards for Mathematical Practice (MP) that suggests developing students' capacity in eight areas (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). The Chinese children seem to be strong in the four MPs compared to their US counterparts according to the teachers' observations in this study: Persevere in solving them (MP1), attend to precision (MP6), reason abstractly and quantitatively (MP2), and construct viable arguments and critique the reasoning of others (MP3). To help classroom teachers equip with strong knowledge and ability in teaching the Common Core State Standards, integrating the international perspectives in mathematics teaching and training more internationally competent teachers is a vital task (Koziol, Greenberg, Williams, Niehaus, & Jacobson, 2011).

Approaches for Internationalization of Mathematics Education

This study used the main elements of internationalization of teacher education addressed by Moss (2012) as the guiding approaches in the East Meets West Program: coursework, fieldwork, mentors, application, and learning and reflection. However, the East Meets West Program differs these four elements in a number of important ways. First, the fieldwork in the East Meets West Program is in the dual language immersion setting where although the teachers faced more challenges in instruction, they had an opportunity observe and work with the two groups of children for their learning; second, the mentors in the East Meets West Program were not just the professors of the course, but also included the local school teachers and Chinese teachers. These teachers had the first-hand experiences in classroom teaching and their feedback to the graduate students' teaching was more meaningful and practical. Last, application in this study not just having the graduate students apply their learning in classroom teaching, but also working with their colleagues in developing and presenting the lessons to children, observing and providing feedback to each other's learning. The model of the East Meets West Program added on Moss (2012) approaches and can be summarized as the six main elements: coursework with internationalization, fieldwork in a dual language immersion setting, mentors from local and international teachers, application of learning international perspectives, collaboration among peers, and learning and reflection.

Collaboration with Colleagues and Lesson Study

It is interesting to note that this study found the strong associations between feedback from the colleagues on their group lessons and discussing mathematics teaching with their colleagues, between feedback from the colleagues on their group lessons and willingness to observe their colleagues' lessons if there is an opportunity; between willingness to be observed by their colleagues and discussion about their lessons and willingness to have the lesson study activity at their school or district (see Table 4).

Collaboration with colleagues can improve understanding and increase teachers' ability to grow (Ball, 1996). The teachers from this study felt working together for planning and teaching mathematics lessons was beneficial to them as classroom teachers. Walker (2013) supported that when given the time to collaborate with colleagues, it benefits to teachers. Professional development should provide more opportunities for classroom teachers to get together to collaborate and discuss about mathematics teaching and learning.

The teachers in this study expressed their willingness to observe other teachers' lessons if there is an opportunity. What is surprising is that the teachers also expressed their willingness to be observed. Williams (1989) has summed up some of the problems of traditional classroom observations. One of the problems is that the teachers did not like to be observed. However, in this study, the classroom teachers enjoyed learning from each other by observing each other's teaching. This finding further support the idea of nonevaluative observation within the context of professional development that is often welcomed by teachers (Richards, 1998).

Another important finding was that the classroom teachers like to have the lesson study activity at their school or district. Lesson study has received more attention in the United States in recent years (Lewis, Perry, & Murata, 2006; Stigler & Hiebert, 1999). It empowers teachers and improves classroom teaching by engaging classroom teachers in a problem-solving process (Stigler & Hiebert, 1999). In this study, the classroom teachers really experienced the benefits of the lesson study in the East Meets West Program and expressed a desire to have similar lesson studies in their schools and districts. With the current needs in implementing the common core state standards, the lesson study is a powerful way to support classroom teachers in a learning community of practice (Robinson & Leikin, 2012).

Overall, the East Meets West Program has provided our graduate students higher level fieldwork experiences on how to teach and learn mathematics differently, especially on how to help students access learning in a dual language setting. It also broadened our students' views with regard to the diversity of ways different cultures and educational systems teach and learn mathematics.

Conclusion

This study set out to determine the impact of the integration of global experiences on in-service teachers' international perspectives in mathematics classroom teaching. The findings of this study suggest that the internationalization of mathematics education is a very important approach in urban teaching and learning. International perspectives will lead classroom teachers to develop a deep understanding of mathematics teaching and learning from different viewpoints, and also leads teachers to collaborate and learn from each other's experiences and perspectives, which provide better choices for classroom teachers in developing effective teaching strategies to support their student learning and help them achieve better learning outcomes. The findings of this study enhance our understanding of classroom teachers' views in collaboration and observation. The five components of the East Meets West Program provide additional evidence with respect to how to internationalization of mathematics education in urban areas, and they will serve as a base for future studies on internationalization of teaching education.

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