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THE DEVELOPMENT OF GLOBAL COMPETENCIES AND GLOBAL MINDEDNESS THROUGH GLOBAL EDUCATION EXPERIENCES

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Abstract
The development of the competencies, skills, and beliefs that prepare learners for success in the globalized world is a desired outcome for educational organizations. Global education can foster the development of these competencies, skills, and beliefs. The study reported within this article focused on the global education experiences of Primary Years Program International Baccalaureate students as they collaborated to address a global issue. Through engagement in global education, the primary students developed global competencies. Teachers reported changes in their own and their students' global mindedness beliefs, however, the quantitative findings did not show evidence of a change in student global mindedness.
Keywords: global competencies, global mindedness, global education

Introduction

Success within the globalized world requires specific skills and competencies. Connecting students globally to engage in collaborative problem solving may be a means for developing the competencies needed for future success. Global education is defined as international education dedicated to foster cross-cultural awareness, cooperation, and understanding (Center for Global Education, 2015). The United Nations Educational, Scientific and Cultural Institution (UNESCO) promotes global citizenship education as a means for providing children with "the understanding they need to cooperate in resolving the interconnected challenges of the 21st Century" (UNESCO, 2016). Global education can improve learning though the breaking down of classroom walls, connecting to authentic audiences, which increases student engagement and motivation to learn (Lindsay & Davis, 2013). Global education experiences foster adaptability, effective communication, creative problem solving, technological proficiency, and cultural empathy as students work collaboratively with other students from different cultures, languages,

perspectives, time zones, and/or hemispheres (Cook, Bell, Nugent & Smith, 2016). Boundary-crossing communication contributes to the development of intercultural understanding, a key global competency (Mortensen, 2015). To prepare students for the globalized world, national as well as international organizations are emphasizing the need for global competence and the inclusion of global education within K-12 school systems (e.g., NEA, 2010, 2015; World Savvy, 2015; GNG, 2015; UNESCO, 2016). By embedding global education into existing school practices, teachers and students are able to work with individuals whose ethnic and cultural backgrounds are different from their own and to develop the communication and collaboration skills needed for the future (Ramler, 1991). The National Education Association recommends that global education begin in early childhood and continue throughout K-12 education, and that public education become the vehicle through which our future workforce attains global competence (NEA, 2013-2014; NEA, 2010).

Purpose

The purpose of this study was to explore the global education experiences of teachers and students within International Baccalaureate (IB) Primary Years Program (PYP) schools in the United States, Argentina, and Mexico as they partnered in a project entitled "IB Learners Connect for Global Issues."The researcher sought to develop a deep understanding of the experiences as well as any changes in perspective or beliefs before and after engagement in global education. The study focused on the development of teacher and student global mindedness and student acquisition and application of global competencies.

Research Questions

The overarching question driving the study was: what globally minded attitudes and global competencies are evident in IB teachers and students engaged in global education? Sub-questions include: In what ways do teacher and student global mindedness evolve as they engage in global collaborative instructional activities? In what ways do students develop global competencies through global education?

Theoretical Basis

Robertson (1997) describes the development of a world culture as a process of identity as a part of the world-system and a conception of humankind as a single global community. The development of a world culture occurs through cross-cultural global interactions. Global education provides a mechanism for interacting across cultures. As students and teachers increase their personal connections to other students, teachers, and cultures across the globe through collaborative projects, the idea of the world as a single place as opposed to many separate places emerges.

Review of Research

Global Competence

The term "global competence" was first used in a 1988 report by the Council on International Education (CIE) (1988 in Hunter et al., 2006). The CIE called on universities to provide cross cultural experiences, such as exchange programs where American students would live for more than three months immersed within a population in which they were not in the majority and English was not the dominant

language, to better prepare them for future life and work in an increasingly interconnected world. Since the term was first used, national and international organizations and businesses, scholars, and educational institutions have refined, changed, or expanded the definition of global competence (Hunter, White, &Godbey, 2006; Deardorff, 2006; Reimers, 2009; NEA, 2010; Mansilla& Jackson, 2013; Mortenson, 2015). Hunter, White, and Godbey (2006) used the Delphi technique (Linstone&Turoff, 1975) to develop a definition of global competence through consensus among senior international educators, United Nations officials, intercultural trainers, foreign government officers, and human resource managers at top transnational corporations. The agreed upon definition of global competence within this study was "having an open mind while actively seeking to understand cultural norms and expectations of others, leveraging this gained knowledge to interact, communicate, and work effectively outside one's environment" (Hunter, White &Godbey, 2006, p. 277).

Based on prior research (Reimers, 2009; Bennett, 1993; Hunter et al., 2006), Li (2013) determined three constructs of global competence: attitudes of openness and tolerance, knowledge of one's own and others' cultures and global issues, and the ability to collect and process information in a cross-cultural environment through communication or research. Through a study of sustained global collaboration among students in the United States and China, Li (2013) found that students' cultural competence was increased through sustained cross-cultural engagement.

Through a study of global competence among engineering majors Lohmann, Rollins, and Hoey (2005) developed a conceptual model and assessment system for global competence. As a component of a comprehensive multi-year mixed methods study of Georgia Tech's engineering international plan, Lohmann et al. (2005) identified the following elements as critical components in the development of global competence: proficiency in a second language, international coursework, and an immersive international experience that connects to the broader context of a coherent program.

Through a comprehensive study of the assessment of intercultural competence, also referred to as global competence, Deardorff (2009) recommended that competence be measured using a variety of assessments and that assessment be integrated throughout the intercultural interaction and include components assessing critical thinking, attitudes, and skills. Deardorff (2009) put forth the idea that intercultural learning is transformational and requires experiences beyond the classroom through such mechanisms as service learning and study abroad. Further, Deardorff recommended the inclusion of face-to-face interactions to promote greater personal and social understanding.

Working collaboratively, the Council of Chief State School Officers and the Asia Society developed global competence matrices to clearly articulate the dispositions, attitudes, and skills needed to act on issues of global significance (Mansilla& Jackson, 2013). The NEA promotes the use of the Main Global Competence Matrix as well as the discipline-specific matrices in the areas of the arts, English language arts, mathematics, science, social studies, and world languages to intentionally design lessons that develop these competencies among students (NEA, 2010). The National Education Association (NEA) defines global competence as the acquisition of in-depth knowledge and understanding of international issues, appreciation of and ability to learn and work with people from diverse linguistic and cultural backgrounds, proficiency in a foreign language, and skills to function productively in an interdependent world community (NEA, 2010, p. 1).

The Main Global Competence Matrix (CCSSO, 2011; Mansilla& Jackson, 2013) provides specific descriptors of ways in which students will demonstrate their ability to investigate the world, recognize perspectives, communicate ideas, and take action through global engagement. The discipline-specific matrices provide a means for "using the subject area's big ideas to understand the world and using the world to understand the big ideas of the subject area" (CCSSO, 2011, p. 1).

Global Mindedness

Global-mindedness is "a worldview in which one sees oneself connected to the world community and feels responsibility for its members" (Hett, 1993, p. 1). Hett (1993) developed the Global Mindedness Scale (GMS) questionnaire to measure global-mindedness in five dimensions: responsibility, cultural pluralism, efficacy, global-centrism, and interconnectedness. The GMS has since been used by scholars within studies of the development of global mindedness by teachers and students through study abroad, global education, and competency in a non-native language (Carano, 2010; Hayden, Rancic& Thompson, 2000; Kehl& Morris, 2008; Cui, 2003).

Through a study of teachers who self-identify as global educators as measured on the GMS, Carano (2010) sought to understand to what these educators attributed their global-minded perspectives. The factors that were attributed to developing a global perspective were: family attitudes, exposure to diversity, minority status, a curious disposition, participation in global education courses, international travel, having a mentor, and professional service (Carano, 2010).

Hayden, Rancic, and Thompson (2000) conducted a study of teachers and students at international schools to determine which factors they each felt were most essential in being internationally minded. Among the 32 items tested, the six that ranked highest among both teachers and students (in descending order of importance) included: being interested in what happens in other parts of the world, being informed about people from other cultures, being aware of the cultural conventions of people from other parts of the world, reading newspapers and books from other cultures, having travelled in a number of countries, and having lived in more than one country (Hayden, Rancic, & Thompson, 2000).

Kehl and Morris (2008) conducted a study of students enrolled in private universities to determine whether the length of a study abroad program had a significant impact on the development of global-mindedness. It was determined that students who had participated in the study abroad experience for greater than eight weeks scored significantly higher in global-mindedness, as measured on the GMS (Hett, 1993) than did students who studied abroad less than eight weeks or not at all (Kehl& Morris, 2008).

Cui (2013) utilized both the GMS and the Cultural Intelligence Scale (CQS) (Cultural Intelligence Center, 2005) in a study of students at a university in the Midwestern United States. Two focus areas of the quantitative study were whether predictors of cultural intelligence could be determined based upon the GMS scores and whether demographic characteristics correlated with the GMS or with the CQS subscales. The perceived competence in a non-native language and experience in education were positive predictors for both global-mindedness and cultural intelligence (Cui, 2013).

Methodology

Research Design

The researcher utilized a mixed methods case study design with an embedded quantitative measure (Creswell & Plano Clark, 2011) in order to gain understanding of the global education experiences of teachers and students. The collection of supporting quantitative data occurred separately from the collection of qualitative data. The researcher collected quantitative student survey data prior to engagement in the extended global education project and upon completion. The purpose of the embedded quantitative measure was to provide deeper insight into student global mindedness beliefs than might be perceived by their teachers.

The researcher sought to understand the experience of global education from various perspectives, including those of the students in the United States and the teachers in the United States, Argentina, and

Mexico. A mixed methods case study approach allowed the researcher to paint a picture of the global education experience through thick descriptions (Erlandson, et al., 1993) of classroom interactions, teacher interviews, teachers' perceptions of student outcomes, responses to student surveys before and after global education experiences, and artifacts of student work.

Sample. A sample of five IB teachers was selected purposefully (Creswell, 2006) to participate in the study. Teacher participants were selected from among attendees of a summer International Mindedness Symposium that was held at one of the participating schools within the United States. Participants included three teachers from an IB school in the United States, one teacher from an IB school in Argentina, and one teacher from an IB school in Mexico. A group of fourth grade IB students (N = 52) from three different teachers' classrooms within the focus school in the United States participated in the quantitative survey before and after the semester long global education project.

To maintain anonymity, pseudonyms were assigned to the teacher participants. The audit trail (Cook, 2016 dissertation) identifies the country of origin for each of the teacher participants by their pseudonyms: Heather, Christina, Lisa, Teresa, and Melissa.

Instruments. Students completed a modified version of the Global Mindedness Scale (GMS, Hett, 1993) at the beginning and the end of a global education project. In a prior pilot study (Cook, 2016), the researcher administered the GMS to a group of fifth grade IB students (N = 56) to assess the reliability of the instrument when used with upper elementary students and made appropriate changes. Within the current study, semi-structured teacher interviews were conducted including some interview questions that aligned with both the GMS factors and the skills and dispositions stated within the Main Global Competencies Matrix (CCSSO, 2011; Mansilla& Jackson, 2013). At the end of the global education project, artifacts of student work were compared with the Global Competencies Matrix descriptors (CCSSO, 2011; Mansilla& Jackson, 2013).

Data Collection. Participating teachers in Mexico, Argentina and the United States were interviewed through video conferencing or email for the schools outside of the United States and face-to-face for schools within the United States. The semi-structured interview questions addressed teachers' expectations of success in the implementation of global education as well as their perceptions of changes in global mindedness and global competencies among their students. Classroom observations occurred within the classrooms in the United States during the global education experiences. Each participating teacher was asked to submit for review a sample of three to five student projects or reflections at the conclusion of the collaborative project.

Students within the participating schools in the United States completed Hett's (1993) Global Mindedness Scale, modified though a pilot study, before and after the global education project as an embedded quantitative measure. The purpose of the quantitative measure was to increase understanding of possible changes in students' global mindedness that might not be captured adequately through teacher interviews alone. The prior pilot study was conducted with PYP IB students in another school within the United States to assess the reliability of the modified GMS when used with younger students (Cook, 2016). Other scholars utilized the GMS (Hett, 1993) with high school and university level students (Ricks, 2014; Kehl& Morris, 2007-2008; Cui, 2013).

Data Analysis

Classroom observations, teacher interviews, and collected samples of student work following engagement in global education were used to assess global competencies as compared with the Global Competences Matrices (GCM) (CCSSO, 2011; Mansilla& Jackson, 2013) in order to address the research questions. The GCM describes specific skills, across a matrix, as indicators of student global competence. The researcher analyzed student classroom behaviors, teachers' perceptions of student competencies, and the completed projects as compared with the GCM skills and dispositions categories: investigate the world, recognize perspectives, communicate ideas, and take action.

To assess changes in global mindedness, the researcher analyzed both quantitative pre- and post-GMS data and qualitative data from classroom observations, pre- and post- teacher interviews, teacher planning documents, email exchanges, and artifacts of student work. The researcher looked for alignment of the data with the factors of global mindedness identified by Hett (1993): responsibility, cultural pluralism, efficacy, global centrism, and interconnectedness.

Qualitative data analysis. Transcripts from classroom observations and teacher pre- and post-interviews, email exchanges, teacher collaborative planning documents, student reflections and student projects were all utilized in the qualitative analysis. The researcher used HyperRESEARCH software (http://www.researchware.com) to code and categorize ideas within the documents, allowing themes to emerge. As the researcher analyzed the data, an audit trail was generated.

Quantitative data analysis. Descriptive statistics were calculated to describe the means and standard deviations of four factors of global mindedness: responsibility, cultural pluralism, efficacy, and interconnectedness. A paired samples t-test was calculated to compare the mean global mindedness values for participants before and after engagement in the extended global education experience. Paired samples t-tests were also calculated to compare the mean values for each of the subscale factors of global mindedness before and after participation in the global project.

Mixed methods data analysis. Following an embedded mixed methods design with the quantitative measure embedded within the broader qualitative case study, the researcher first analyzed the quantitative and qualitative data separately, then considered the quantitative results as compared with the primary qualitative data (Creswell & Plano Clark, 2011). In considering both sets of data, the researcher looked for contradictions as well as consistencies to enhance overall understanding of any perceived and reported changes in global mindedness.

Results

Qualitative Findings

Qualitative analysis of the coded pre- and post- teacher interviews, classroom observations, teacher planning documents, teacher email exchanges, and artifacts of student work revealed the following categories: describing the global experience, the development of global competencies, the evolution of global mindedness, and the benefits and challenges of global education. The overarching theme that emerged from the analysis was global education causes change. Evidence of the changes brought about through global education experiences can be seen in school systems and structures, student beliefs and behaviors, teacher beliefs and practices, and local and global community relationships. The qualitative

findings of the study are referenced within the audit trail (Cook, 2016 dissertation). The teacher names listed in the audit trail are pseudonyms.

Describing the Global Education Experience. Through an extended global education collaborative experience, students and teachers in Primary Years Program (PYP) International Baccalaureate (IB) schools in the United States, Argentina, and Mexico worked to identify a global problem and contribute toward a solution. The teachers named the global collaborative project, which began during the two-day International Mindedness Symposium, IB Leaners Connect for Global Issues.

During the summer symposium the teachers began developing a collaborative Google document for use in planning the event. Group email exchanges occurred throughout the project for scheduling and follow-up. The initial interaction among the students occurred though their "digital handshake" (Lindsay & Davis, 2013) videos. Each class created a video that gave insight into the interests, life pursuits, and talents of each of the members of the partnering classes. Through a collaborative planning document and email exchanges, the teachers decided that rather than attempting to have a Skype session between all four schools across all three countries at the same time, they instead would split into pairs, where each pair of schools would communicate synchronously each month; then the pairings would switch for the following month.

Through monthly Skype sessions throughout a semester, students collaboratively shared ideas about global issues that they might want to address. The teacher and students in Argentina shared that they had prior experience working with a project called A Leg to Stand On that raised awareness and funding for prosthetic devices for children. Through email exchanges, the teachers discussed the possibility of working with LIMBS International organization because it was already an established international organization that worked to raise awareness and funding for prosthetic devices for youth. Students at each school decided to create posters and public service announcement videos to raise awareness and funding to provide prosthetic devices for youth through the organization LIMBS International. The teachers thought that if each partnering school worked for a common cause, together they might have a great impact in working toward a solution to a problem affecting children globally.

The Development of Global Competencies. The Main Global Competencies Matrix (CCSSO, 2011; Mansilla& Jackson, 2013) includes descriptors of specific skills, dispositions, and actions across the categories: investigate the world, recognize perspectives, communicate ideas, and take action. The qualitative data were coded in alignment with the skills and dispositions described within the GCM (CCSSO, 2011; Mansilla& Jackson, 2013).

Investigating the world. Evidence of students investigating the world emerged with the digital handshake videos as students across cultures and countries began to learn about each other. Some of the student questions during the first Skype session between Argentina and one school in the United States focused on geologic features, seasons, holiday celebrations, and traditional foods. Students also asked about current national problems affecting each country. When students from the second school in the United States conducted a Skype conversation with the students in Argentina, an earthquake had just occurred in Chile. The students in Argentina shared with the students in the United States that they were able to feel the seismic waves from the earthquake. The teacher in Argentina reported that her students were quite impressed when the American students explained the event through their understanding of tectonic plates.

According to the teacher post-interviews, now when a global issue or geographic location is mentioned in class, students want to find the location on a map and then ask questions about the people

living there and the type of government and issues they experience. In their final conversation with the students in Argentina in December, the students in the United States realized that students in the southern hemisphere were leaving for summer break when the United States was experiencing winter. This was another application of investigating the world as fourth grade students gained a conceptual understanding of seasonal differences across hemispheres.

In comparing the qualitative data with the GCM descriptors (CCSSO, 2011; Mansilla& Jackson, 2013), the researcher discovered that students did identify an issue and explain the significance from a globally focused frame of reference; however, there was no evidence within the qualitative documents studied of student-generated questions driving the project. During the videoconferencing sessions, students from Argentina and Mexico used a second language to communicate; however, the students from the United States, for most of whom English is the first language, communicated predominantly in English. Students utilized some international sources and media through the LIMBS International website when researching the problem of children in need of prosthetic devices. The qualitative data analysis revealed some evidence of the development of an argument based on compelling evidence both through the student reflections and the persuasive videos. For example, student videos included persuasive language and strategies in order to raise the needed funds to achieve the class fundraising goal for prosthetic devices. Similarly, the fundraising campaign posters, videos, blog posts and reflections showed examples of the synthesis of evidence to construct a response. One fourth grade fundraising campaign video included the statement, "without these prosthetics, amputees would lose their jobs, families, and sense of self-worth", while imploring viewers to make donations.

Recognizing perspectives. The teacher pre-interviews indicated that one of the intended outcomes that teachers had for their students was recognition of different perspectives. Melissa, who grew up outside of the United States, felt particularly strongly about this goal. She shared in her pre-interview that her experience growing up in South America was that it was common practice to consider other countries and other people. When she moved to the United States, she felt that this perspective was missing among her students. They seemed to only be concerned with perspectives and people within the United States, and sometimes only within their own community.

Recognizing perspectives was evidenced through the "no walk recess" during which students in the IB school in the United States sat and wrote reflections in their journals rather than playing at recess to increase empathy for those who are missing limbs. One student reflected that as a child missing a limb, "I would feel disappointed that I couldn't move in my young years before I get old." The students visited the prosthetics ward at a local hospital to examine what it is like to receive and learn to use a prosthetic device.

Comparing with the descriptors of skills and dispositions under the Recognize Perspectives column of the GCM (CCSSO, 2011; Mansilla& Jackson, 2013) revealed strong alignment. Through the "no-walk recess", the student reflections, and the student-developed questions and answers during Skype conversations with international partners, students recognized their own perspectives as compared with the perspectives of others. The class discussion about the LIMBS International project centered around differential access to knowledge, technology, and resources as students learned about the ways that other countries respond to children with special needs. They began to learn that education for all is not standard practice in all countries.

Communicating ideas. The global competency, communicating ideas, was actualized by students in many ways. The first example came through the digital handshake videos. Students in all schools have Spanish and English languages in common, however, most of the students in Argentina and Mexico are

native Spanish speakers for whom English is a second language and most of the students in the United States speak English as a first language and are learning Spanish. The digital handshake videos incorporated many non-verbal components such as pantomimes and music to minimize language barriers as students first began to communicate. The digital handshake videos also included some written language as students held up signs with their names as well as their life goals or interests.

Ongoing communication occurred in many forms. During the face-to-face Skype sessions, students repeated words, enunciated clearly, and adjusted their volume so that their global partners might clearly understand what they were saying. During some of the Skype sessions, technical difficulties required flexibility on the part of the teachers and students in troubleshooting and brainstorming effective means of communicating. During one session, the school in Mexico missed the appointed Skype session due to Internet problems at their school. The students in the United States decided to video themselves asking questions to send to the students in Mexico so that perhaps they might have more success recording their answers and sharing them asynchronously. During a scheduled Skype conversation between the two schools in the United States, one school had video but not audio access while the other school had the reverse. Their solution was at first to communicate through Skype's Instant Messaging feature as students typed in questions, then listened to responses. Eventually the students and teachers decided to conduct the verbal conversation over a conference telephone call while the school with video access was also able to see the partnering class.

Throughout the project, students practiced their written communication skills as they wrote reflections about their global experiences. One student wrote, "I think it's very generous – I mean the fact that we can change a life – give someone a chance at a job again." They also created posters and wrote scripts for the LIMBS International campaign. One slogan included "Give Hope and Save Lives." Students practiced their persuasive speaking as they performed in their public service announcement videos seeking contributions for a global cause.

The Communicate Ideas column of the GCM (CCSSO, 2011; Mansilla& Jackson, 2013) describes recognition of diverse audiences, how they may perceive different meanings from the same information, and how that affects communication. Teachers did discuss with students cultural and language differences as well as time differences prior to the initial Skype sessions to better prepare students for the cross-cultural exchanges. Students were careful in wording their pre-planned questions using language that was not offensive or US-centric. The skills of listening and communicating effectively with diverse people using verbal and nonverbal behavior was clearly evident though the Skype sessions as well as the troubleshooting that ensued when there were technology problems. Students and teachers worked to ensure effective communication even when this entailed overcoming technological barriers. Students effectively selected appropriate communication technology; however, the teachers recommended more face-to-face interactions between students when they implement the project next year. Although students did write reflections throughout the project, the researcher did not find evidence of reflection questions specific to effective communication and understanding.

Taking action. Through the teacher planning documents and email exchanges, it was apparent that teachers wanted students to make as many decisions about the global issue and solution as was age appropriate. They did not begin the global collaborative project with a particular global issue in mind, but allowed the ideas to emerge through collaborative conversations among the students and teachers through the video conference synchronous communication sessions and follow-up email exchanges. Evidence of the students taking action was seen throughout their LIMBS International campaign. Students conducted research to develop their persuasive arguments for the fundraising campaign, created videos to share with the school and their families, documented their thinking through reflections, and shared their processes

with their global partnering schools. Prior to each synchronous video conference with the partnering schools, students generated a list of questions to ask and topics to discuss to keep the project moving forward.

In comparing the language of the Take Action column of the GCM (CCSSO, 2011; Mansilla& Jackson, 2013) with the observed behaviors, evidence emerged that students did have opportunities for personal and collaborative action to address issues in ways that improve conditions through their LIMBS International project. Prior to selecting the LIMBS project, students and teachers reflected on other options and their potential for impact. The creation of the campaign videos provided students with a means for acting in creative and ethical ways to improve global conditions through action. The campaign videos were aired in December, so students included language that captured the holiday spirit. In one video, students held wrapped packages in front of a decorated tree urging viewers to give the gift of a prosthetic device to a child in need. The students sang songs comparing what they are able to do with what amputees are not: "How thankful are we that we can run and play. There are amputees around the world who need our help today." Another video used a spy mission theme as the student actors challenged the viewers with a mission to raise funds for LIMBS International. Each student played a role in the class videos.

Students reflected on their capacity to advocate for and contribute to improvement globally and locally through their reflective blogs about their local fundraising efforts for a global cause. One student commented, "I like that the company is non-profit. That means all the money that is donated goes to the people who need it most." Another student stated, "I like how they send every penny to those who are in need." Another stated, "…when I saw a picture of a little girl living in a cardboard box and living without an arm and I realized how much our help would impact her life it made me realize that our help can make the world a better place."

The Evolution of Global Mindedness. Qualitative data were coded in alignment with the factors of global mindedness: responsibility, cultural pluralism, efficacy, global centrism, and interconnectedness.

Responsibility. Evidence of responsibility came through the students' development of their posters and public service announcement videos as well as their positive attention and preparedness during the collaborative Skype sessions. Students who were assigned to lead the discussion had questions prepared and practiced in advance so that the hour of time together could run smoothly, barring technical difficulties.

Through the LIMBS International project, students developed empathy for children around the world who are missing limbs. One student reflection about what it would be like to be a child amputee included, "I would feel sad because I would just have to suffer and watch other people do what I could not do." Students took responsibility for taking action to improve the lives of the 15 children whose prosthetics they funded. "I feel like giving a limb is like giving a person's life back. It's like a chain – when the person is doing better then the family is doing better too." Students further expanded the influence of their efforts by taking responsibility for sharing with their global partners how they, too, might develop a campaign to raise funds for LIMBS International.

Cultural pluralism. Cultural pluralism extended beyond the Skype sessions with global partners and into their own diverse classrooms. Teachers shared their reflections on these changes during their post-interviews. Teresa shared that two Muslim students within her classroom were now much more open about sharing their culture as well as how they have been treated than they seemed to be prior to the global

education experience. The students shared that they are sometimes called names. They explained to the class that they are not a part of the bad things that are shown on TV. Lisa shared that her students have a new appreciation and respect for the native Spanish speakers within the classroom and that now they often ask them to interpret for them.

Efficacy. The sense of efficacy was realized as students began to understand that the actions that they take within the classroom can have an impact on others in the world. Educators expressed a feeling of empowerment as a result of the success of the global education experience. Teresa remarked, "connecting with teachers in Argentina and Mexico has opened my eyes to new ideas." Lisa shared, "it empowered me to see these kids can be empathetic. All you have to do is put an idea in front of them and let them run with it." The teachers shared that they realized how much fourth grade students can accomplish.

Global centrism. Global centrism began to be realized as the global collaborative project continued and students began to find their common IB language about units of inquiry across country boundaries. The students within Argentina, Mexico, and the United States working on a collaborative project became less focused on cultural differences between them and instead focused on working together to accomplish the goal. Skype conversations became more centered on the project and less centered on questions about culture. They became focused on working collaboratively to improve the lives of children around the world who are missing limbs.

Interconnectedness. The sense of interconnectedness was clearly evident, beginning with the digital handshake videos, as students began to see and comment about commonalities across countries. Although the Skype conversations occurred whole class-to-whole class, the small groups at the front of the cameras in each country were clearly able to connect face-to-face. The leading groups rotated each month giving many students an opportunity at the front. Selecting an organization that specifically focuses on a global problem affecting children increased interconnections as students began to compare their own lives to those of children missing limbs.

Global Mindedness. In addition to each of the five factors of global mindedness, a theme that emerged from the data analysis was overall global mindedness. Through post-interviews with some questions focused on perceived changes in global mindedness, teachers noted that students did demonstrate changes in behaviors and responses that indicated to them a change in global mindedness within students. Melissa commented that students are now "more aware of the world and the society they are a part of." Lisa shared that her students now feel a personal connection to the children overseas who will be receiving the prosthetics and that they are looking forward to hearing their stories. Heather shared that through global education, her students are becoming more open and caring toward others in the world.

The Benefits and Challenges of Global Education. Teachers shared a range of issues associated with the challenges of implementing the global education project. The first challenge to overcome was how to fit an extended global project into a school year already filled with the IB curriculum, specials classes, and the requirements of state testing. Another concern shared was the lack of intimacy when communicating whole class-to-whole class through Skype. Teachers wondered how they might structure the project differently in the future so that the hour of connected time involves more direct face-to-face

interaction between students. All teachers interviewed shared concerns about technology glitches that happened almost every time they tried to connect synchronously. They each shared appreciation that technology made the project possible, but disruptions with connectivity also created challenges.

In spite of the challenges, all of the teachers involved in the project plan to implement global education in the future. Michelle remarked, "It is a challenge and stressful, but so worth it." Teresa commented that fourth grade students do not have the opportunities that the older students have to study abroad. Engaging in global education at a young age might plant the seed of interest in future study abroad opportunities when the children are older. Some of the greatest benefits are that connecting to others globally can reduce conflict leading to a more peaceful world through intercultural understanding. "It has been enriching for everyone."

Quantitative Findings

According to the quantitative data analysis, there was not a significant change in global mindedness of students after the global education experience as compared with their reported global mindedness before participation in the experience ($p > 0.01$). The means and standard deviations as well as the the t-test calculations for each of the global mindedness factors before and after participation in global education are seen in Table 3. Due to student coding errors, among the 52 student participants, only 39 of the pre- and post-surveys could be paired.

Table 1*Effect of Global Education on Global Mindedness of IB PYP Students (N=39)*

	Pretest		Posttest			
	Mean	S.D.	Mean	S.D.	t(38)	p
Responsibility	4.32	0.54	4.12	0.49	1.49	0.15
Cultural Pluralism	4.18	0.60	4.00	0.54	2.18	0.04
Efficacy	3.83	0.84	4.04	0.82	1.66	0.11
Interconnectedness	3.95	0.60	4.00	0.54	0.38	0.70
Global Mindedness	4.10	0.46	4.07	0.40	0.47	0.64

These values indicate that for the sample of 39 students whose pre- and post- surveys were compared, student responsibility, efficacy, cultural pluralism, and interconnectedness scores did not change significantly after the global education experience as compared with their scores before the experience.

Mixed Methods Findings

Although teacher perceptions of student global mindedness, as reported through teacher interviews, indicated changes in global mindedness, this finding is inconsistent with the quantitative pre- and post- GMS results. When considering the quantitative findings as a supplement to the overall qualitative case study, the qualitative findings did provide evidence of growth in the global mindedness factors: responsibility, efficacy, interconnectedness, cultural pluralism, and global centrism. The quantitative findings did not support the qualitative findings.

Conclusions

To address the overarching research questions, what globally minded attitudes and global competencies are evident in IB teacher and students engaged in global education, the researcher analyzed qualitative and quantitative data during a six-month global education experience among PYP students across three countries. The emergent finding from the analysis of qualitative data was that global education causes change. Some of the changes brought about through global education include changes in beliefs and behaviors. Changes in beliefs included increased responsibility and efficacy among both teachers and students as they came to believe that they could make a positive impact on the world through collaborative action toward a solution to a global problem. Changes in behavior included the development of cross-cultural communication skills and the recognition of different perspectives as teachers and students investigated the world beyond their own classrooms.

The research question, in what ways do students develop global competencies through global education, was addressed through an analysis of teacher pre- and post- interviews, classroom observations, teacher collaborative planning documents, and artifacts of student work. The researcher analyzed the data sources and assessed student behaviors as they compared with the specific descriptors stated within the Main Global Competencies Matrix (CCSSO, 2011; Mansilla& Jackson, 2013). The findings indicate that the four categories of global competencies: investigate the world, recognize perspectives, communicate ideas, and take action, were actualized through global education. The observed and documented behaviors that most aligned with the various levels of descriptors stated within the GCM (CCSSO, 2011; Mansilla& Jackson, 2013) were recognize perspectives and take action. Teacher pre-interviews revealed that one of the intended outcomes of the global education experience for students was increased recognition of the perspectives of others.

To address the research question, in what ways do teacher and student global mindedness evolve as they engage in global collaborative instructional activities, the researcher analyzed qualitative data as well as a quantitative pre- and post- modified GMS. Qualitative data sources included teacher pre- and post-interviews, classroom observations, teacher planning documents and email exchanges, and artifacts of student work. The quantitative modified GMS given before and after the global collaboration project was first analyzed separately from the qualitative data, and then the results were compared. Although the qualitative analysis of data sources indicated a perceived change in student global mindedness in the areas of responsibility, cultural pluralism, efficacy, global centrism, and interconnectedness, the quantitative analysis did not indicate a significant change in student beliefs before and after engagement in global education.

There are several possible explanations for this discrepancy. The perceived changes in student beliefs by the teachers may not have been an accurate reflection of students' actual changes in global mindedness beliefs. Another possible explanation for the discrepancy is that the global education experience was too short in duration for a measurable change to occur. The whole-class interactions might not have been personal enough to cause a change in beliefs among individuals. Prior experience with the IB curriculum might have pre-disposed these students to global minded thinking. The pre-survey was administered after the students were given an overview of the upcoming project. Anticipation of the upcoming project might have influenced their answers on the pre-survey. The pre-engagement GMS scores were already close to the high end of the scale (4.1 on a five-point Likert scale); therefore, a ceiling effect might explain the lack of change between the pre- and post- survey results.

Some of the changes in teacher beliefs and practices, as shared through interviews, included growth as professional educators through collaborative planning. Although the educators within the focus IB school in the United States had prior experience planning with other IB educators in the United States,

planning and discussing the IB curriculum with IB educators in other countries was reported as an enriching professional growth experience. Educators reported having gained new perspectives on some of the IB inquiry units of study as well as the culminating exhibition projects. Teachers also reported a sense of empowerment that they could successfully implement an innovative practice, such as global education. Some teachers reported changes in their own understanding of cultures that were previously unfamiliar to them. They all reported feeling a strong connection to their global partners and expressed an intention to continue the project next year.

Changes in systems and structures within the school also resulted from the global education experience. Whereas in previous years, teachers felt that it was difficult to schedule all of the required IB curriculum and assessments, focus on the whole child, and prepare learners for required state assessments, this year they managed to do all of those things in addition to implementing an extended global education experience. Global education, especially when it includes synchronous communication across different time zones, can be unpredictable resulting in inefficient use of time. In making global education a priority, teachers were able to re-think their schedules and school structures in a way that provided the time and flexibility needed. All teachers interviewed strongly felt that the struggles with planning and scheduling global education experiences were worth the effort because the outcome for students was greater than what might have been achieved through the school curriculum alone.

Changes also occurred in both local and global community relationships through global education. Although the students within the focus school in the United States set their original fundraising goal at $1200.00 to provide prosthetic limbs for four children, the campaign was much more successful. They actually raised more than $5600.00 which allowed them to provide funds to purchase prosthetic devices for 15 children. The founder and Chief Financial Officer of LIMBS International was so impressed with the students' efforts that he paid a surprise visit to their classes.

As students shared their global experiences with their parents, the local community became increasingly interested in and supportive of the project. Not only did students' fundraising efforts far exceed their goals, local television and newspapers learned about and reported on the global experience. Teachers within the IB school in the United States formed stronger bonds as they employed collaborative problem-solving, brainstorming, and design thinking to successfully implement an extended global education project. Global community relationships were developed through the global education experience as well. Beginning with the two-day International Mindedness Symposium, educators from across the Americas met face-to-face and made a commitment to engage in a global education project during the upcoming school year. Teachers later reported that the face-to-face commitment made in the summer influenced their perseverance in the project in spite of technological and scheduling difficulties. Teachers and students across collaborating countries formed a bond that helped maintain prolonged engagement in the project. Teachers shared hope that the bonds formed among PYP students might influence their future decisions about study abroad and travel.

Global education causes change, including changes in student behaviors. Global education can foster the development of global competencies, better equipping students with the skills and dispositions needed for the future global workplace. Prolonged global education experiences may also increase global minded thinking, however further study is needed in this area.

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