It's a Small World: Creating Global Networks Across Content Areas

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Abstract

The intersection of interdisciplinary instruction (IDI) and global education is the framework for educators in both basic and tertiary education to create authentic and engaging learning environments. Web 2.0 is the media that can make it happen. Segregated subject areas can become integrated through global project work and attention to the connections that need to be made between technology, pedagogy, and content knowledge in 21st century classrooms. Global project networks such as IEARN and ePals serve as catalysts for creating global experiences at any grade level.

Introduction

In a large, suburban vocational school in southern New Jersey, students crowd around a laptop squeezing into the webcam viewfinder for their friends in Ghana to be able to see them for the first time. Students in Mrs. Lock's tenth grade English class just began using the International Education and Resource Network (IEARN) and ePals this school year, and the classroom environment has changed dramatically. Mrs. Lock has been able to incorporate concepts from mathematics, social studies, science, technology, and English all in one unit, and keep her thirty-one tenth grade students engaged and learning through blogging, podcasting, and videoconferencing.

Classroom projects, which incorporate technology, coupled with a global component have the potential to transform the educator and student experience. Over the past decade, schools across the United States have begun to implement technology across content areas. However, the most exciting development has been in the ability to create interdisciplinary instruction through Web 2.0 (Gowers, 2009).

Global project based learning embeds interdisciplinary studies in its framework. According to McDonald and Czerniak (1994), the key components of interdisciplinary studies include students' abilities to see concepts from multiple perspectives and greater depth, to integrate problem solving, and to build creativity and communication skills. Additionally, the thematic organization of ideas within interdisciplinary studies can be a powerful tool, which adds a "dimension of experience" that creates valuable experiences for students and teachable moments for educators (McDonald & Czerniak, 1994, p. 9). Differentiation and personalized learning can occur with ease within global

based IDI projects, and can connect learning to society for authentic teaching (McGhee, 2001).

This article will examine the use of global project based learning to connect content areas and create authentic learning experiences for students. It will discuss the effectiveness of utilizing real world interdisciplinary projects. Next, global project networks and communities such as IEARN and ePals will be discussed. Finally, it will provide ways to develop and implement global projects in both basic and tertiary classroom environments.

A Rationale for Interdisciplinary Instruction

Interdisciplinary instruction, or IDI, is an approach that consciously strives to combine language and methods from more than one discipline in order to explore a central topic (Jacobs, 1989). Therefore, effective IDI should culminate in learning activities that simultaneously improve student performance related to standards in two or more disciplines (Mohnsen, 2011). There are many positive reasons to implement IDI into the classroom. The use of IDI reinforces the relevance of the subject being taught by purposefully linking it with other disciplines (Combs & White, 2000; McDonald & Czerniak, 1994). Content areas are integrated rather than being kept isolated from each other. IDI allows for collaborative student work, as well as more opportunity to integrate reading, writing, and critical thinking skills than traditional approaches. Therefore, learning is authentic and connected (Hall, 1995). Mohnsen (2011) suggests that interest in one subject may be improved through the use of IDI activities. Students may begin to see connections between subjects and therefore transfer information from one discipline to another. Effective IDI should be an enhancement of the current comprehensive curriculum, not a replacement of curriculum elements.

There are many benefits of interdisciplinary instruction. The research suggests that IDI promotes greater student involvement and interest, improves teacher morale, and leads to increased student achievement (Combs & White, 2000; Michelson & Sriraman, 2009). Through the study of one major theme across disciplines, students are offered information from a fresh perspective. They are encouraged to discover new insights and synthesize relationships between ideas and disciplines. Effective use of IDI can encourage critical thinking skills and creativity, as well as promote the development of lifelong learning skills (Duerr, 2008).

The typical structure of the American public school systems is to create levels of basic education: elementary, middle, and secondary. These schools are comprehensive in nature and enroll students from diverse background and ability levels (Organization of U.S. Education, 2008). Interdisciplinary instruction is commonly used in elementary and middle school settings, but is often abandoned in high school (Combs & White, 2000). This is likely due to the internal structure of elementary and middle schools, which typically provide common planning time to teachers and the flexibility to combine classes for a co-teaching experience. It could certainly be an effective tool in the secondary setting, but the departmentalized, bell-driven structure there is an

impediment to its implementation (Combs & White, 2000; Duerr, 2008). As a result of the secondary school structure, IDI can be seen as a way to address the concerns of fragmentation and isolated discipline-centered, skill instruction (What is Interdisciplinary/Cross Curricular Teaching?)
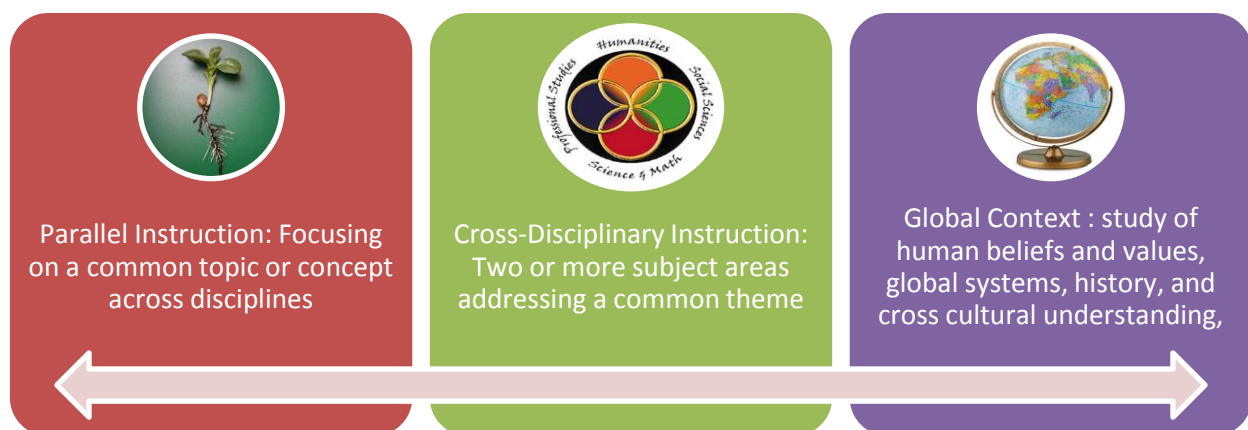
Blair's (2011) study with undergraduate students in a studio/workshop setting shows student perspectives of the benefits of IDI in higher education as well. At completion of the IDI project students identified the following elements as strengths of interdisciplinary group work: "building larger networks and relationships that can be beneficial on a personal and professional level, learning from other disciplines, learning new skills, working in a team, learning more about your own methods and finding ways to improve it, and gaining cultural knowledge from other students" (Blair, 2011, p. 43). The strengths of the project are reflective of how students will have to adapt to attain 21st century employment and to be competitors in a global world (Bottery, 2006).

Several different models can be employed based on the instructional goals and desired outcomes. IDI may be designed according to different models such as parallel instruction, cross disciplinary instruction, or infusion (Juliano et al., 2002). It may occur for the length of the course or for the duration of a particular unit (Jacobs, 1989). Global instruction, designed to get students thinking about the big picture, can be accomplished by using a combination of parallel and cross disciplinary instruction. Figure 1 illustrates the connection between parallel instruction, cross-disciplinary instruction, and global education. Parallel instruction involves teachers delivering synchronized instruction of a common topic or concept, which allows students to draw connections between the two disciplines through shared assessment (Juliano et al., 2002). For example, a unit focused on World War II and the Holocaust in a 9th grade History class would be taught at the same time students are reading and discussing The Diary of Anne Frank in English class. While parallel instruction relies almost solely on delivery of connected content in multiple disciplines, cross-disciplinary instruction depends on team teaching or common planning. Cross-disciplinary projects are also more thematic and problem based than those associated with parallel instruction. An example of cross-disciplinary instruction would be a health teacher and a science teacher co-teaching a unit on healthy eating. The health teacher might focus on different aspects of nutrition and exercise, while the science teacher focuses on the physiological aspects of leading such a lifestyle (National Consortium on Health Science & Technology Education, 2007). While any combination of disciplines is acceptable and encouraged in IDI, it appears the most common combinations include social studies and language arts, as well as science, mathematics, and technology. These pairings lend themselves well to the creation of IDI units (Combs &White, 2000; Duerr, 2008; Hall, 1995; Sumrall & Shillinger, 2004). The final type of IDI, infusion, is the most difficult to implement. It requires deep knowledge and understanding of multiple disciplines by one teacher. For example, to implement infusion while teaching a unit on World War I, the teacher must have in-depth knowledge of language arts, history, political science, engineering, geography, and the arts.

It should also be noted that IDI is not, according to Jacobs, a panacea. There are trade-offs and limitations that must be addressed. Adequately and effectively implementing of IDI in any form requires a great deal of commitment, planning, and organization (Jacobs, 1989). There are often factors present beyond control of the teacher, which may limit the quantity and quality of IDI. Such factors include state and local mandates regarding testing, pacing, and the adopted curriculum in place (Brand & Triplett, 2012). Full awareness of these limitations is essential for successful implementation in basic education. While commitment and planning may still be an issue in higher education, the restrictions of testing and curricular choices evident in basic education are not.

IDI as described above certainly offers positive outcomes; perhaps the addition of a third element would make IDI even more effective for our 21st century students. As Bottery states "Thinking at the global level deepens our understanding and broadens our possibilities" (Bottery, 2006, p. 96). Combining interdisciplinary instruction with global instruction is the step that will lead our students into the future.

Figure 1: Interdisciplinary Instruction

Parallel Instruction: Focusing on a common topic or concept across disciplines

Cross-Disciplinary Instruction: Two or more subject areas addressing a common theme

Global Context : study of human beliefs and values, global systems, history, and cross cultural understanding,

Using Technology to Create a Global Classroom

Education should equip students to be responsible citizens and workers. A purposeful education prepares student to live in the future, and to examine issues and offer solutions that are creative and imaginative. Global literacy is necessary to complete this vision. It has the ability to bring students closer to a world that they are normally isolated from in the traditional classroom setting. The project-based models utilized in global classroom networks allow educators to combine multiple content areas and utilize cutting edge technologies (Boondee, Kindrakarn, & Sa-Ngiamvibool, 2011). Connecting students to other cultures can transform fear and lack of knowledge into understanding, and can serve as a catalyst for lifelong learning (Demski, 2008; Gowers, 2009).

In the United States, The Common Core Standards and the Technological Pedagogical Content Knowledge (TPACK) framework for teaching are both current trends in educational technology. Educators can still follow the mandates of the state standards for content areas, while incorporating meaningful learning experiences for students. In

this type of learning environment teachers can allow students to make choices about their learning which impact accountability and leadership. Students from kindergarten through higher education can benefit from honing skills in creativity, problem solving, critical thinking, and collaboration while learning to use Web 2.0 tools.

Several different types of Web 2.0 tools such as Skype, wikis, blogs, iMovie, discussion forums, and podcasts can be used as the media to conduct global educational exchanges (Gowers, 2009). While the choice of media is the catalyst for student engagement, the importance of global exchange rests on the opportunity to build a relationship of understanding through collaboration and inquiry. It is important that educators understand the difference between multicultural education (MCE) and global education (GE) as well. There are many similarities between MCE and GE, however, the main difference is that MCE "examines issues within the context of the nation in which students live, and GE looks outside the nation of residence" (Lucas, 2010, p. 212). Both MCE and GE deal directly with issues of cultural diversity, human rights, and prejudice reduction. Global education is unique because it seeks to build global citizens who are knowledgeable about both local and global issues and interested in finding ways to solve challenging problems.

To prepare for global education and interdisciplinary unit work, educators must gain awareness and social responsibility in the following areas: ecological and political awareness, service to the public and local community, attention to accountability, building trusting relationships, a commitment to transparency, and a greater degree of self-refection and thoughtful evaluation of practice (Bottery, 2006). The mindset of the educator must mirror what is expected from students. Educator preparation is crucial in developing a successful global project. Initial and ongoing professional development, as well as peer leaders and mentors are necessary components in global and technological project success.

Global Projects Incorporate Common Core Standards

Inquiry and curiosity are at the heart of global classroom projects, and with the adoption of the Common Core Standards educators will need to reexamine the intersection of pedagogy, technology, and content. Forty-six states in the United States have adopted the Common Core Standards. One might question how these standards differ from anything that we have seen before and why the adoption was necessary. The Common Core Standards for grades six through twelve are separated by content and include English Language Arts, Mathematics, Reading and Writing for Science and Technical Subjects, and Reading and Writing for History and Social Studies. The Common Core Standards are the United States attempt at developing a national component to education. In the United States, individual states govern curricular decisions, so there is a discrepancy between what students learn from state to state and even school to school. Inconsistency of this magnitude is not fair to students and places them at a disadvantage.

The Common Core Standards also differ from previous standards because they incorporate 21st century skill sets designed to build communication, collaboration, creativity, critical thinking, and problem solving skills. The standards include components which directly address 21st century skills such as credibility, reliability, and validity of sources, technology and publication, evaluation and integration of multiple sources from different types of media, gathering relevant information from multiple authoritative print and digital sources, and making strategic use of digital media in presentations (PA Common Core Standards, 2012).

To illustrate the connection between the Common Core Standards and global classroom projects consider the possibilities presented by a cultural exchange via video conferencing. Communication, collaboration, and creativity are at the forefront of any global exchange. When Mrs. Lock decided to begin a global project with her 10th grade students the first step she took was communicating with her students about their global interests. Once students decided on Ghana, Mrs. Lock used the International Education and Research Network to find partners to work with her students. After a partner was found, students had to decide on a web 2.0 platform to create their projects and exchange information. The class chose a class blog and the discussion forums in IEARN as means of collaboration and communication. Through the sharing of life stories, creation of avatars and content, and generation of discussion questions students were critically thinking and problem solving. All of these important steps should take place before embarking on a conferencing experience.

The use of multiple forms of media also emerges from global project exchanges. Communicating across continents requires a great deal of creativity and variety in presentation. While using word documents, power point presentations, and PDF files can suffice, it is necessary for students to learn to navigate and construct within new technologies such as iMovie and VoiceThread. These technologies offer a third dimension that power point does not. Students are able to use video, audio, images, and text to create.

### The Content Connection: Technology, Pedagogy, and Content Knowledge

The TPACK framework seeks to guide instruction to the ideal recipe for technology, pedagogy, and content knowledge. Figure 2 provides an example of how each component of TPACK ties into global project learning. Web 2.0 technology is the medium for the projects. Flexibility in pedagogy is created by how educators choose to use the technology for instruction and assessment. Because global projects are usually problem based, they lend themselves to interdisciplinary planning and collaborative teaching. Global projects are also grounded in individualization and attention to real world tasks.

The content knowledge component of the TPACK framework is accomplished through interweaving 21st century skill development, interdisciplinary studies, and global education. For example, 21st century skills include critical thinking, communication, collaboration, and creativity (Partnership for 21st Century Skills, 2011). Creative

assignments, instruction, and assessments provide students with opportunities to hone these skills while creating meaningful projects related to the students' own interests. The TPACK model also values and encourages collaboration between educators. The purpose of interdisciplinary or cross disciplinary teaching is to "build community and promote curricular integration" (National Middle School Association, 1996, p 29). Through interdisciplinary instruction students should be able to see the connections between content areas, and the content's connection to real world activities and scenarios.

Pedagogically, educators must make a conscious decision to connect multiple disciplines and reflect on current practice. At the basic education level, co-teaching, team teaching, and academic teaming should increase (Reed & Groth, 2009). This will allow experts in each academic content area of the project to contribute, and provide a high quality of instruction in each discipline. In tertiary education, instructors meet by department and should make a conscious effort to plan projects, which may be used in conjunction with other courses. For example, an instructor teaching College Composition I teams with a nursing instructor for a research project. A project is created where the class must compare and contrast the experiences of nurses in the United States versus nurses in other countries around the world. As a team, the instructors search for nurses in France and Turkey willing to serve as guest speakers. Via videoconferencing technology, such as Skype or Oovoo, the students observe the speakers, ask questions, and use the interview opportunity as the basis for their research projects.

Figure 2: TPACK in Action
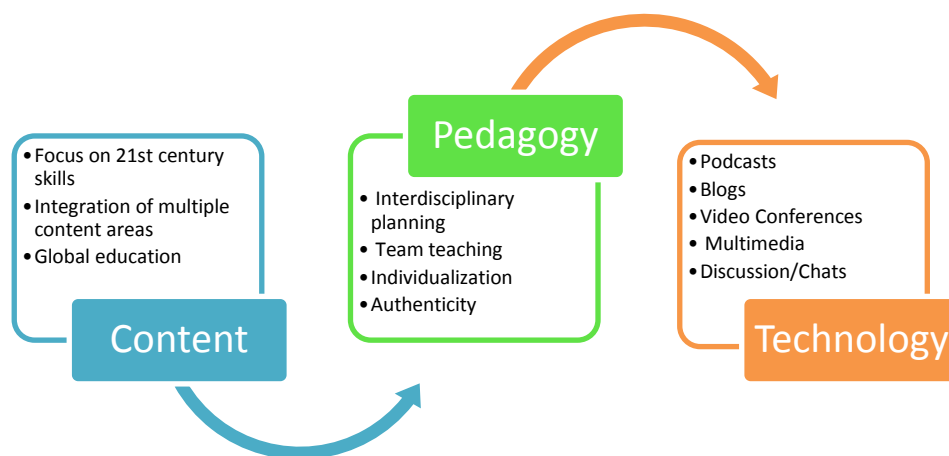
Developing and Implementing Interdisciplinary Global Instruction

Global instruction requires extensive planning to be successful and to produce meaningful learning outcomes. One way that global exchanges occur is through web-conferencing. The first steps in preparing students for a live web conference includes establishing pre-existing knowledge, developing questions for inquiry, and conducting research to answer inquiry questions (Quillen, 2010). For example, Mrs. Lock began by

asking her students to think about countries of interest, and compiled a list of those options. She then took her choices to IEARN and created a discussion forum in the teacher collaboration area requesting participation from secondary level schools only. She received inquiries from schools in both Ghana and Afghanistan and was able to set up exchanges with each. A challenge in live video conferencing with countries around the globe is the time difference, but this can be averted with careful planning.

Through the exchanges students were able to improve their reading, writing, speaking, and listening skills, while also working on concepts from history and geography. Throughout the unit, students participated in discussion forums online where they wrote about the typical American school day, culture, and languages. This informal learning occurred naturally. Students read about the lives and cultures of their partners in other countries and were intrigued by the similarities and differences. Students shared the information that they learned via the discussion forums in small and large groups, created posters and wikis, invented avatars, and worked collaboratively to research new information they wanted to learn and questions to drive discussion during scheduled video conferences. The power in the project came from Mrs. Lock's enthusiasm and excitement and the students' engagement.

Both IEARN and ePals provide teachers with a database of existing projects to join and begin as well. It is easy to search for specific grade levels, subject areas, and languages. Teachers can also use the existing discussion forums to search for current partners, since the projects are all ongoing. Figure 3 provides a brief description of IEARN, ePals, ecoach, and TakingItGlobal, as well as links to each resource. While Mrs. Lock enjoyed using the projects for content related projects, she also was able to find light-hearted and fun ways to get students interested in learning. One such project was a Christmas Card exchange with students in Taiwan. Again, students used the message boards to get to know each other and were assigned students in the Taiwanese classroom to write to. Students wrote letters, drew pictures, and decorated the cards. While the project was holiday related, it also taught students about Taiwanese and Chinese culture.

School climate can changed dramatically as a result of participation in global projects. While Mrs. Lock was the sole educator at her school participating in global projects and thematic interdisciplinary projects, the initiative soon spread to other teachers within her school. Mrs. Lock believed in the benefits of global projects enough to meet with administration and request a school membership to IEARN. The principal was on board, and Mrs. Lock began offering professional development sessions in IEARN, ePals, and using Skype to set up video conferencing events.

Mrs. Lock focused on building global projects and various examples of IDI into her existing English curriculum. However, if teachers have more curricular freedom they will be able to use a project as the basis for an entire unit of study. An example of an interdisciplinary project, which can be used with grades one through ten is The Great Bean Race project from ePals. It combines geography, science, mathematics, and English. The project takes place over a timeline of four weeks and is "a competition

among classrooms from different countries to see which collaborative team can grow the tallest plant" (Baskota, 2012). Students are expected to design and conduct a controlled bean plant experiment and investigate for ideal growth conditions. Students take daily growth and temperature measurements in a log and take weekly digital pictures. Each week, student teams compare their plants' progress with other classrooms. The interdisciplinary nature of the project is seen through assessments and assignments involving scientific investigation, experimentation, measurement, calculations, photography, observational drawings, and written tasks. At the end of the experiment students are expected to discuss what might have caused the difference in their plant's growth. The common consideration points to climate and geography, thus the incorporation of social studies. The Great Bean Race project was created by a school in Kathmandu, Nepal, and sought partners from anywhere in the world for participation.

If there is a specific type of assignment or project that educators are looking for that has not yet been created, they are invited to create it. Instructors and educators in all instructional areas can create their own global projects to share with the world and utilize websites like IEARN and ePals to find collaborative partners to do so. For example, an Earth Science instructor at the basic or tertiary level would like to examine science in daily life in different geographical locations. The instructor wishes to provide students with the opportunity to write about science from a unique perspective. The catalyst for this assignment is Annie Dillard's memoir, "Finding Science in An American Childhood" (Educational Broadcasting Corporation, 2004). The memoir is based on Dillard's experiences growing up in Pittsburgh, and discusses interest in rock collection, the properties and formation of rocks, and changes in the earth's crust. The instructor would like students to share their own interest in science by choosing a science related topic and connecting it to their geographical locations and or childhoods. For the assignment to be authentic, meaningful, and real, students are asked to share their writings with a partner class via email, wiki, class website, etc. The element of audience is a powerful incentive to produce and create quality work (Combs & White, 2000).
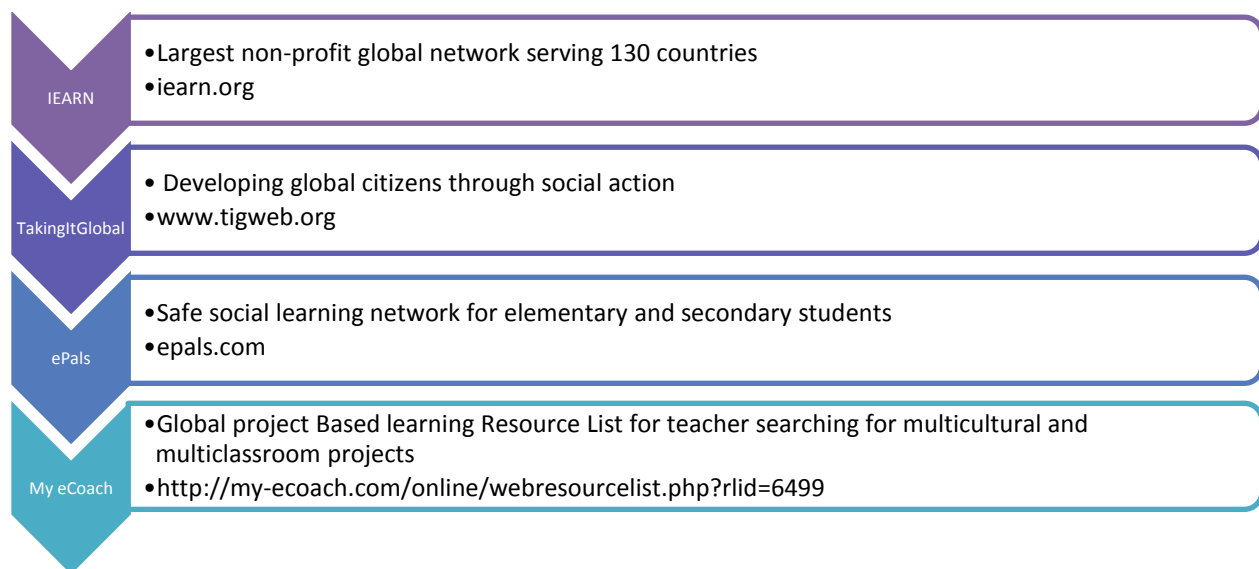
Many of the available projects for global education and IDI initiatives target K-12 education; however, there are important implications for higher education. According to Brigham (2011), global citizenship is a way of understanding how the world works, linking our lives to others, exercising political rights, critically thinking, and challenging injustice. In order for students to be prepared to work and live in a global world they must possess knowledge of it, acknowledge social injustice and act upon it, and learn to collaborate and problem solve in a variety of contexts both face to face and online. Global projects can give students practice in this arena before they enter the public sphere and competitive employment.

Enough Tolerance: A Framework for Understanding

When Mrs. Lock began her global classroom experimentation, she was not sure how her ideas would be received by faculty, staff, and students. She began global partner work with IEARN in around the time that Barack Obama was elected to the presidency.

She decided to start small, and invited students to participate in the National Writing Project's Letters to the Next President Project. The assignment fit well into the tenth grade persuasive essay curricular requirement and provided students with a national audience. Students were required to use the Letters to the Next President website to research their chosen candidate, and had to choose three issues of concern that they wished to speak about with the president. Letters were drafted and peer edited, and during the research and writing component students debated often about their chosen candidates stance on abortion, immigration, military involvement, and healthcare.

Figure 3: Finding Global Partners

IEARN	•Largest non-profit global network serving 130 countries •iearn.org
TakingItGlobal	• Developing global citizens through social action •www.tigweb.org
ePals	•Safe social learning network for elementary and secondary students •epals.com
My eCoach	•Global project Based learning Resource List for teacher searching for multicultural and multiclassroom projects •http://my-ecoach.com/online/webresourcelist.php?rlid=6499

Overall, the academic writing that emerged from the project was a success, and students enjoyed reading student work from around the country on similar issues. They spread the word to classmates and teachers saying, "Google me." There was a sense of pride that emerged from both the face to face and electronic audience (Duerr, 2008). However, this was also the first time that international issues of discrimination came to light. Some students had strong feelings about the possibility of President Obama's foreign heritage and voiced forceful prejudiced opinions equating all Iraqis to terrorists. The stark realization is that students across the globe "see images and hear opinions about complex global issues, but are seldom well equipped to process this information" (Gowers, 2009, p. 41). Influences within the home and school community shape students' perceptions and they do not always possess the factual information needed to make an informed decision. Perhaps this is where global education may serve us best- as an arena to interact with, and learn from, people from all over the world. In the process, we will share and develop new perspectives.

At first, Mrs. Lock's invitation to a global exchange was not warmly welcomed by her students. They were irritated and confused. They asked questions like, "Why do we have to talk to people from Africa? How are we going to talk to them? Do they even speak English?" To combat their aggravation, Mrs. Lock met their questions with

questions. She asked her students to consider what they knew about Ghana, Afghanistan, and India. Unfortunately, most of the information that the students produced was prejudiced and based on stereotypes absorbed from social media, television, and movies, and their own ignorance. Students realized how little they actually knew about international cultures, religions, and geography, and chose to continue with no further protest. Solomon and Schrum (2007) suggest that educators must consider the implications of 21st century content areas such as global awareness, financial literacy, civic literacy, and health awareness. Global awareness potentially leads to understanding. Therefore, tolerance of other cultures should not be the goal of global instruction, because it implies a continued ignorance and misunderstanding of culture. The end goal, must be global understanding, knowledge, and mutual respect. Simple tolerance is not enough for today's global community.

Ultimately, a paradigm shift is necessary to equip students to live a culturally diverse world. By definition, tolerance implies enduring not accepting, understanding, and empathizing. The concept of empathy is not present within the curriculum in American schools, but it should be. Educators who seek to build this ideology within students prepare them to be responsible global citizens and powerful agents for change far beyond the four walls of the classroom (Hollingsworth, Didelot, & Smith, 2003). The most effective action that can be taken to change classroom climates is for the educator to consistently speak up and address misunderstandings and stereotypes as they occur (New Resources from Teaching Tolerance, 2012).

Conclusion

Global educational projects have the potential to provide students with skills that they will be able to use in daily life and careers beyond the four walls of the classroom. Communication, creativity, critical thinking, and collaboration skills are an integral part of working and living as a global citizen in the 21st century. While some would say "the world has changed," the philosophy should be that it is changing and evolving daily. Current pedagogical practices must change to "equip students for the interdisciplinary and multidisciplinary world they are inhabiting" (Blair, 2011, p. 33). The spillage of knowledge into the student vessel is a concept of the past and the shift to constructivist and connectivist ideologies is necessary to create classrooms, work spaces, laboratories, and communities for the future.

Interdisciplinary instruction provides opportunities for deeper learning and engagement. Learning networks such as IEARN and ePals make it easy to find projects, students, and educators in a safe and secure online environment. The importance of global learning reaches beyond knowledge that can be assessed and measured. Its most powerful component is its ability to shape the life-long learner and to broaden the narrow mind. Reflection on one's own perspective and learning to understand the diverse perspectives of others is a common occurrence in global project work.

Instead of memorizing facts and dates, taking assessments, and losing the information, a lasting impression is made, and perhaps a lasting relationship built. Knowledge is

solidified because it is experienced in the context of real world experiences and in collaboration with others. Mrs. Lock and her students have kept in contact with Mr. Abdul Makail and the students from his school for boys in Afghanistan because there was a sincere interest born out of their project work. Communication with individuals from diverse backgrounds is a necessary part of life's journey and building these skills at any age is imperative to successful schooling, employment, and global citizenry (Bottery, 2006). To provide students of all ages with these tools requires providing educators with professional development and peer mentoring opportunities. Proper planning, teaming, and curriculum development are imperative in interdisciplinary instruction and global education. We are living in a global world. We should be designing global instruction.

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