

Running Header: GLOBAL PROJECT-BASED LEARNING

Global Project-Based Learning
A Foothill College Krause Center for Innovation Online Course
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Chapter One: Introduction

Introduction

This project involves the creation and teaching of a Foothill College Krause Center for Innovation (KCI) online course entitled Global Project Based Learning. Currently it is a two unit course authored that I have authored with the assistance of others. Jackie Kawashima, technology coordinator in the Oak Grove School District and Foothill College Krause Center for Innovation LINC (Learning in New Media Classrooms) instructor has helped me the original course materials and helped me reformat the course into the online course template that I with the help of the college's Educational Technology Services personnel have created for the LINC online course. Dr. Ted Kahn, CEO of DesignWorlds has also help edit the content and is currently teaching the online course. Ruhi Vasenwalla Kahn, my intern from Stanford University's Educational Technology Masters Degree Program is currently working with me to add multimedia elements to the course materials. At the time of this writing this course is still a work in progress. It has been taught four times using Foothill College's Etudes courseware. Each time it has been taught Dr. Kahn and I have solicited feedback from our students that I have been using to edit and improve the course.

This project is only one step in an ongoing process or personal quest to bring students from around the world together to do meaningful, real world research, to create important

projects that will have a positive impact, and to bridge the differences that divide the people of this world.

An important part of every child's education is learning to live and work in this emerging global economy. Global project based learning helps students become aware of and develop understanding of other cultures and languages. It is an international application of information literacy that helps to achieve the over arching goals of improving global relationships for commerce, improving the environment and promoting worldwide peace. (Hutchings and Standley, p.2)

Globally literate people have an understanding of diversity, culture and language that allow them to live and work in peace with each other. We live in a culturally, racially, religiously and linguistically diverse world full of wonderful opportunity. Giving our students the chance to work with students who live in other cultures can only strengthen global understanding and promote world peace. In our global economy it is critical that our students develop an inherent respect for the many cultures, races, religions and languages of the world.

According to Hutchings and Standley (p. 59) One of the strong characteristics of PBL is Team-based Learning. They point out that multi-cultural teams are more effective than mono-culture teams because of the synergy that comes from the sharing of different thinking processes and values. (Hutchings and Standley, p. 59) Diversity leads to creating

problem solving. It also creates a climate in which students learn to appreciate and learn from each other's differences.

The world is full of a rich array of cultures, each evolving from a varied yet interconnecting history. The state of the world today is the result of these parallel, yet overlapping histories that have caused various parts of the world to develop different cultures and ways of living. Hutchings and Standley point out that students from different cultures will come to the project with different thinking processes, but that these cultural differences are positive and teachers need to help students appreciate the cultural differences and work through the difficulties and differences that will inevitably arise because of the differences in cultural backgrounds. (Hutchings and Standley, p. 59)

Communication is critical to the success of your global project. Consequently it is critical for the teachers involved in planning global projects for their students to carefully plan how to deal with language differences. The ASTL (Art Science and Technology For Learning) Project found <http://www.edugal.org.il/teleproj/default.htm> sponsored Water Pollution in Brazil and California found at <http://www.garlic.com/~lullah/brazilus/water.html> was a collaboration between a Brazilian high school and an American elementary school. The teachers wrote the original project plan cooperatively in English using email to exchange ideas and project plans. Teachers agreed from the beginning that the American teacher would do the editing because English is her primary language. When the students began working together some of the students' (in the American classroom) primary language was

Spanish. These students discovered they could discern emails written in Portuguese well enough to help translate them to English. Between the translations of the Spanish speaking American students, emails and files in English from Brazilian students who were studying English, and a Web based translator the various student teams were able to communicate effectively using written language. One of the more amusing events that came from the language differences was that the American students began to notice that many of the initial email messages from their Brazilian partners were signed with the words "slugs and holds". The American students were upset by the apparent violence of these closing words until one student figured out that it was a matter of translation. "Slugs and holds" stood for "hugs and kisses".

Written language, however becomes a greater problem if the written language of the partner classrooms use different characters or scripts. Once a primary language for the project is agreed upon, the ability to communicate orally using video or audio conferencing might be a more effective tool. In working with Japanese teachers this author discovered that these teachers and their students have more difficulty in a written environment than in an oral video conference environment. Body language and use of oral English that does not require the learning and use of a different character set seemed to improve communication between participants.

A positive outcome from communication between linguistically different students is that students learn to become very clear and precise in their communication. Hutchings and Standley advocate that the teacher should become the linguistic facilitator or "cultural

and language go-between who models an open-minded attitude, patience and cultural empathy." (Hutchings and Standley. 60)

Having had the opportunity to participate in global projects with students, it became obvious that there is a need to help teach, mentor and coach teachers who would like to involve their students in meaningful curriculum-driven projects with students in other countries. Consequently this project involves the creation and editing of an online course for the Foothill College Krause Center for Innovation's Learning in New Media Classrooms (LINC) program.

Background

I can probably date this project back to my childhood. As a child I developed an innate curiosity about the world from the foreign interns that would come to stay in our home. My father was chief of staff at two hospitals in New Brunswick, New Jersey, and although as a family we did not travel outside of the East Coast of the United States, we hosted interns from German, Italy and the Philippines. As a child, their tales, their photographs and their languages fascinated me. When I was in the fifth grade my teacher arranged a pen-pal letter exchange between my class and students in Germany, and when I was in the sixth grade my Girl Scout troop began a pen-pal exchange with Girl Scouts in Brisbane, Australia. I was forever hooked. I continued to correspond with my pen-pals for many years.

My under graduate degree is in social studies. Originally I'd hoped to become a diplomat working for U.S. embassies, but my faculty advisor at Marietta College in 1963

suggested that women should not go into that line of work. He thought I should pursue another type of career, so I decided that I would teach social studies. After graduating from Marietta College in Ohio I was hired to teach social studies and English in Belpre, Ohio, but just before school began, the district hired a gentleman who could coach football and basketball to teach these classes and reassigned me to teach third grade. I, then, decided to begin a M.Ed. in special education at Ohio University. While at Ohio University I had the opportunity to study art history in Bergamo, Italy. This was my first opportunity to live and travel abroad. I became convinced that travel was the best education, and have not only traveled extensively since then, but after I married and had children, my entire family traveled as often as we could. I still believe that this is the best educational gift I could have given my children.

After completing my M.Ed. at the University of Cincinnati, I taught special education, elementary, Title 1, and gifted and talented education (G.A.T.E.) classes for many years. Ultimately, because of my experimentation with computers in the classroom that began in 1982 when Apple began donating computers to schools, I became involved with a few online projects with my students.

The first online project I did with my students was the National Geographic Society Kids Network projects. Authored by Monica Bradsher, these projects, which are no longer available, provide rich science-based thematic curricula. Over several years my students participated in the acid rain, solar energy and trash projects. The Kids Network provided

partner classrooms from around the world. All partners were doing the same experiments and sharing their data online.

Next my students and I became involved in the Jason Project at

<http://www.jasonproject.org>. The Jason Project is founded and operated by Dr. Robert Ballard who discovered the Titanic. Each year Dr. Ballard takes a team of research scientists to a different part of the world to conduct their research. Teachers from around the world are given the curriculum that will prepare their students to understand the research being done and are trained to use this curriculum with their students. The students involved in the project conduct experiments in their communities that correspond to the research being done by Dr. Ballard's team. They share their findings online. The culminating event is a field trip to a local PIN site (ours was NASA/AIMES in Mountain View, CA) for a videoconference with the researchers in the field.

Because of my involvement in these two online projects, and because of a local history project I had done with my students called the Great Edenvale Detective Caper which can be found online at <http://www.lullah.com/GEDC/> in 1995 I was invited to participate in the Multimedia Makers project sponsored by Dr. Ted Kahn, then at the former Institute for Research on Learning (IRL) Dr. Kahn had received a CalREN grant and Edenvale School where I taught was selected to be upgraded from an ISDN connection to a T1 connection. Through the Multimedia Makers Project my students work collaboratively both online and face to face with students at Frost Elementary School in the Oak Grove School District to create HyperStudio stacks that tied local history to science and math.

Next, because of my involvement in the Multimedia Makers project, in 1998, I was invited to apply to the Art Science and Technology Institute at Migal Galilee Technological Center, Kiryat Shemona, Israel. This institute found at <http://www.edugal.org.il/teleproj/default.htm> provided face-to-face training for teachers from around the world in collaborative Internet based collaborative project planning an implementation. Ultimately it has become a basis for the model I've used for this project. As a selected participant I planned and executed a water pollution with E.E.P.S.G. Dona Idalina Macedo Costa Sodre in Sao Caetano do Sul, Sao Paulo, Brazil. This project can be found online at <http://www.garlic.com/~lullah/brazilus/water.html>.

The actual idea of creating and institute, workshop or course that would bring teachers together to learn how to plan a global project using available Internet technologies began in 1999 when the water pollution project I had done with a Idalina School in Sao Paulo Brazil became one of then finalists for the Intel Award. I was asked to create a replication plan for final award selection. The winner of this award was to receive a \$25,000 grant. Had I won this award it would have enabled me to provide a small group of teachers will new tools and resources for successful collaborative web-based projects with their students.

At the time, I was working in the Oak Grove School district in San Jose, California as a technology learning coordinator for the Challenge 2000 Multimedia Project (Challenge 2000 Multimedia Project) and a G.A.T.E. (Gifted and Talented Education) teacher at

Edenvale School. I was also on the Leadership and Curriculum Committees for the Santa Clara County Office of Education's (in collaboration with the California Technology Assistance Project Region 5) CTAP5's Internet Institute. Additionally I was a CTAP Fellow having written up my water pollution project as a WebQuest for the CTAP sponsored SCORE Science (Schools of California Online Resources for Educators) Web site found at <http://www.score.k12.ca.us>.

My concept built on, and leveraged, my earlier work with several organizations. In collaboration with the Joint Venture Silicon Valley Challenge 2000 Multimedia Project, Santa Clara County Office of Education/CTAP5's Summer Internet Institute – i²99, and the Oak Grove School District DesignWorlds for Literacy Project, I planned to offer a Summer Institute for teachers who wanted to do environmental collaborative web based multimedia projects with a partner in another school and perhaps another state or country based on four models:

- a. The Santa Clara County Office of Education's Summer Internet Institute:
<http://etc.sccoe.k12.ca.us/i99/>
- b. The Challenge 2000/ SCCOE Tier 2 Summer Project Based Learning +
Multimedia Summer Institute:
<http://etc.sccoe.k12.ca.us/i98/tier2/tier2info/index.html>
- c. The DesignWorlds for Literacy Project in the Oak Grove School District
<http://www.garlic.com/~lullah/earth/index.html>
- d. The ASTL (Art, Science, Technology for Learning Project, Migal Institute, Israel
<http://www.migal.co.il/teleproj/>

The goal of this proposed summer institute was to foster up to 6 collaborative web-based multimedia projects (12 teachers) that:

- Put students in charge of own learning
- Address significant, real-world issues/problems
- Create collaboration across communities, nations
- Capitalize on potential of technology including the Internet
- Use project-based learning with multimedia

The Specific Objectives for this replication plan were:

1. To teach teachers to use multimedia, the Internet, and project-based learning to improve learning and student achievement in environmental science and other interdisciplinary fields
2. To help teachers mutually develop collaborative web-based projects as powerful learning tools that will provide their students with the information literacy skills they will need to live and work in the twenty-first century.
3. To teach teachers to use a variety of web and multimedia tools with their students
4. To provide ongoing mentoring and coaching for teachers during the 1999-2000 school year who are doing collaborative web base projects with their students
5. To change the way the participating teachers think about and plan curriculum so that learning is a powerful and exciting experience for their students.

The replication plan involved helping teachers to use the innovative methods used in my project to develop their own environmental science collaborative projects that would build upon and extend the water pollution project my students did with Idalina School in Sao Paulo, Brazil. Interested teachers would have been invited to apply to participate in a 5-day workshop. Applicants would have been asked to propose specific project needs and ideas. The workshop organizers (Dr. Michael Simkins, director of the Challenge 2000 Multimedia Project, Judy Powers, Coordinator of the Educational Technology Consortium (ETC) at the Santa Clara County Office of Education, Dr. Ted Kahn, CEO of DesignWorlds, and Linda Ullah) would have reviewed the applications and matched teachers who had similar project needs and ideas. The suggested partners would then be asked to write a final collaborative application proposal.

Criteria for selection would have included:

1. Teachers must have some experience with project-based learning, environmental education, and Internet based and multimedia technologies as demonstrated by one or more of the following:
2. Successful completion of the Tier 2 Summer Project Based Learning + Multimedia Institute including completion of project with students
3. Successful completion of an prior SCCOE Summer Internet Institute including successful completion of project with students and demonstrated ongoing use of project-based learning and multimedia in with students.

4. Successful completion of the Oak Grove School District's DesignWorlds for Learning Summer Institute including the successful completion of project with students.
5. Participation in a Challenge 2000 Multimedia Project Team including the successful completion of project with students.
6. Participation in some other training that involves project-based learning, multimedia, and the use of the Internet and a demonstrated ability to complete a successful project with students.
7. Participants must have show evidence of completing a collaborative technology related project with students
8. Project teams must demonstrate collaboration, using Internet technologies, in developing their project proposal.
9. Teachers must submit two project proposals to apply. The first independently, and the second with their partner. The quality and feasibility of the plan will be considered.

Applicants who qualified would have attended a 5-day summer institute, in June or July 1999 in the San Francisco Bay Area. The teachers would have received a one-week intensive training in collaborative Web based multimedia project creation and implementation. The intention was to pair up to a total of 6 local teachers paired with a total of 6 out of the area collaborating teachers or collaborating teachers from other Bay Area schools. The projects would have had to have a science focus, and the teachers would have had to have agreed to complete collaborative web based project with their

students by April, 2000. The participants would be asked to exhibit their projects in a Multimedia Exposition and post their project in the Challenge 2000 Multimedia Project Online Classroom Examples Database at <http://pblmm.k12.ca.us/> All participants would have published their projects on the Internet. During the collaboration projects the participants would have copied me (so I could provide ongoing mentoring and coaching) on all emails between themselves and their partners that involve the planning and implementation of their projects. Participants would have attended two follow-up meetings online in an online multi-user virtual environment called Tapped In at <http://www.tappedin.org> with me. For their effort partner teachers would have been paid a stipend when they completed their projects with their students and fulfilled other follow-up requirements.

Had this project been funded my commitment would have been:

1. To provide a one-week summer institute for teachers who participated in this replication plan.
2. To provide ongoing mentoring and coaching for the replication plan partners
3. To provide some of the software and tools necessary for teachers to successfully completed their projects
4. To provide a \$500 stipend for each teacher who successfully completed the collaborative project with his/her students and partner, and fulfills all other previously stated requirements

Other components of this proposal included:

1. Teachers who participated in this replication plan would have been asked to join together in a web ring. This will link each of their projects and resources.
2. Tapped In (a multi-user virtual environment for educators at SRI, International) would have provided online support for teachers who are members of Tapped In <http://www.tappedin.org> who are doing environmental projects with students. This would have included:
 1. After School Online discussions between teachers with ongoing projects to build a community of collegial support
 2. Online discussions designed to link similar projects with each other and resources
 3. Online mentor and coaching
 4. A Water Pollution/ Environmental Science listserv
 5. An international Water Pollution Conference to have taken place in Tapped In that would have been an online chat between the schools who would have been part of the replication process and other schools who had similar water pollution or environmental science projects. It would have been a culminating event. The goals for the outcome of this online conference would have been:
 - a. To give students who have been doing collaborative projects a chance to share their projects in real time.
 - b. To generate real suggestions for improving the world's watersheds
 - c. To share with others what these students have learned.

The evaluation of this five-day institute would have been as follows

1. The Tier 3 Summer Institute part of this institute would have been evaluated by an online survey that will become part of the evaluation package for the SCCOE i99 Summer Internet Institute.
2. The specific global environment project institute would have been evaluated by SRI, International as part of their overall evaluation of the Challenge 2000 Multimedia Project.
3. All projects would have been evaluated by participating teachers according to their assessment plan and the degree to which they had met their stated objectives.

Although this was not the project selected for the actual award, I have continued to believe that the plan has merit. Consequently I've been continually looking for ways to help teachers learn how to plan, organized and conduct global projects with their students. Currently, I have two projects that build upon this background and the models I've discussed. One is the Krause Center for Innovations Earn While You Learn Institute. Information about this institute can be found at:

<http://linc.ca.campusgrid.net/home>. The other project is the Global Project-Based Learning Online Course.

Problem

With the advent of Internet technologies in our schools comes the wonderful opportunity to expand the curriculum to involve collaborative projects between students in different schools and different countries. In order for teachers to be engaged in designing,

developing and implementing curriculum-based online global projects that improve student learning they need to be trained, mentored and coached.

Purpose

Currently, through the Foothill College Krause Center for Innovation, I am involved in two projects that address the above state problem. One is our Earn While You Learn Institute. This is a three-week intensive institute with year-long follow up that trains, mentors and coaches teachers to create multimedia and online projects that they will do in their classroom with their students. The other is an online course in global project-based learning. The purpose of the global project-based learning online course is to empower teachers and their students to either participate in an existing online project or to create and implement their own global project with partner teachers and students.

Global projects are exciting for both teachers and students. When you do a project with a partner class from another country, state or community you enrich the lives of everyone involved in the project while giving students the opportunity to develop the skills necessary to live and work in a global economy.

Research Questions or (Null) Hypotheses

Research Questions

- Are teachers interested in connecting their students in meaningful curriculum-based projects?
- If properly taught how, can and will teachers complete a global project

- What are the obstacles that prevent teachers from integrating global project-based learning into their classrooms?
- What are the characteristics of teachers who do plan and execute global projects with their students?
- What support do teacher need to do a successful global project with their students?
- What kinds of global projects are available for teachers to adapt or adopt?

This project is primarily qualitative research. Consequently neither a hypothesis nor a null hypothesis is necessary. However, data concerning the number of teachers participating in the project, and their success in implementing their projects will be evaluated. For this reason both a hypothesis and a null hypothesis are included in this report.

Hypothesis

If given training, teachers will use the Internet to connect their students in meaningful, curriculum-driven projects with students in other parts of the world.

Null Hypothesis

Teachers will show no interest in doing global projects with their students.

Assumptions

1. Teachers are interested in learning how to use available technologies to design, develop, and implement global projects with their students and students in other countries.

2. Global projects enrich and enhance student learning.

Limitations

1. Number of teachers enrolling in the Global Project-Based Learning online course
2. The ability to follow up with, mentor and coach the teacher who take the course.
3. Money

Delimitations

As discussed earlier ideally a face-to-face institute coupled with an online course that involves online follow up, mentoring and coaching would be the best model for this project. Currently, the online course only meets part of the need.

Significance of the project

Transportation and the telecommunications have caused geographic distances to shrink. Business and industry is now engaged in a powerful global economy in which the economic state of one country can affect the economic conditions in the world. Wars, economic collapse of nations, and cultural misunderstandings can have disastrous effects on the entire world. Our students must learn to work collaboratively with students in other countries and with students in other parts of the United States because they must develop global literacy skills in order to work within the global economy.

Definition of Terms Used

- **Asynchronous Communication:** communication which does not require participants to communicate at the same time, such as e-mail and online forums.
- **Global Literacy:** the ability to understand and value both your culture and other cultures
- **Global Project-Based Learning:** students engaged in meaningful curriculum-based projects with students from other cultures
- **Synchronous Communication:** communication which involves participants in communicating at the same time, such as a chat room

Chapter Two: Review of Related Literature

Introduction

This review of literature is part of a larger project on global project-based learning. It is based on the idea that when students around the world are engaged in real-world collaborative projects they are developing higher order thinking skills and practicing essential skills for living in a global economy as well as the solving real world problems that affect their futures. Based on a constructivist model of project-based learning, global project-based learning appears to be a new, growing and promising field in which much research is needed.

The idea behind global project-based learning that by bringing students together virtually to work on and solve real-world problems, share history and culture, learn language, and/or just get to know each other many issues of global and cultural misunderstanding can be, if not eliminated, bridged. Imagine a student in Beijing on a class field trip to the Great Wall or the Forbidden City sharing in “real time” that field trip through photographs or streaming video with a sixth or seventh grade students in San Jose, CA who are studying ancient China as part of the standards based instruction social studies instruction. Imagine an impoverished orphan in an emerging nation sharing his or her story with students in industrial nations who can help make the life of this child and other

children in the world better. Students can share what they are learning about their own and each other's history and culture. This will circumvent the bias that appears in textbooks and local resources so that students can more powerfully appreciate and understand divergent historical perspectives. Young students can share their lives, their homes, families, their foods, traditions and communities with students in other parts of the world.

Collaborative international projects in which students use the Internet to compare data on water quality and pollution, endangered species, and other world ecological concerns are rapidly springing up with the goal of finding global solutions to these problems. Other global projects are using the Internet to connect students to help struggling and emerging countries with the problems of poverty, hunger, and disease. Free the Children, a Canadian based organization, was begun by a twelve-year old boy. It has grown into a large multinational organization that uses the Internet to connect students to help solve the global problems of child labor, prostitution, exploitation and endangerment.

The thesis of this paper is that children can and do make a positive difference in the world by collaboratively researching and solving important problems through global project-based learning. Emerging Internet technology tools are making this more viable and powerful.

Definition of Global Project-Based Learning

For the purpose of this paper global project-based learning shall be defined as teachers and students using Internet based technology to collaboratively work/study together

through a common curriculum-based project. This project involves clear curriculum based measurable learning goals and objectives, student and teacher shared decision making, collaborative group work between students in distant classrooms, an extended time frame, a real world need or problem to be solved, both formative and summative assessment, and the use of available technologies for communication, collaboration and creation of the final product. (Challenge 2000 Multimedia Project)

Review of Literature Constraints

The concept of global project-based learning using Internet technologies is so new that little available academic research focusing on student achievement as a result of its use was found at this time. The best studies found involved Computer Mediated Collaborative Learning (CMC) in ESL (English as a Second Language) and foreign language classrooms. “Research to date on CMC in the language classroom has been thin and has largely consisted of innovators reporting on the outcomes of their own teaching.” (Warschauer, 1997) Most of the articles read in preparation for this paper involved distance learning that did not truly embrace the concept of students working collaboratively with students in other areas of the world on meaningful curriculum based projects. It was easier to find anecdotal articles and information on both teacher developed global projects and either commercial or organizational projects to join. Yet, it is the premise of this writer that the educational potential for this type of educational model is extremely significant.

Effectiveness of Project-Based Learning

Research conducted by SRI International on the Challenge 2000 Multimedia Project, an award winning U.S. Federal Technology Challenge Grant in the San Francisco Bay Area, concluded that project-based learning supported by multimedia projects did not lower standardized test score and produced the added value of improved higher order thinking skills. Teachers who were involved in the Challenge 2000 Multimedia Project reported that their students displayed increased motivation, increased responsibility for their own learning, better peer collaboration, improved content mastery, better understanding of target audience, greater self-confidence and self-esteem, more peer teaching, better technology skills, more time on task, and more skill in analyzing and problem solving as a result of project-based learning. (SRI, 2000) William Penuel of SRI, International in Menlo Park, CA conducted a performance assessment comparing multimedia project classrooms with traditional classrooms. This assessment concluded that students engaged in project-based learning multimedia classrooms demonstrated significantly better performance in the areas of content understanding, and attention to the impact of design and audience on the creation of the final product; however students' standardized test scores on the SAT-9 in the Multimedia Project classrooms, while showing comparable gains or slightly higher scores, were not significantly higher in reading, language arts and mathematics. (SRI, International)

According to Harold Wenglinsky an associate research scientist at the Princeton, N.J.-based Educational Testing Service, "Computers can raise student achievement and even improve a school's climate. But they have to be placed in the right hands and used in the right ways... What we do know for certain is that when teachers use the computer to teach higher-order thinking skills, students benefit." (Archer, 1998)

History of Global Learning

Throughout time people have traveled, traded with people in other places and returned home reveal their treasures and to tell others of their travels. Within recorded history people have chronicled their travels and have sought ways to continue communicating with the people they've met along the way. This has led to vast changes in the world. Wayfarers brought back spices, plants, animals, clothes, and new ways of life to their homelands. Traveling minstrels told of exotic places and brought news of friends and relatives in far off places. As people made contact with others the need to understand other cultures and learn new languages became increasingly important. As merchants and traders brought back imported items to their homelands the beginnings of a global economy were formed. New technologies emerged and spread throughout the world. Technologies such as the printed press had a tremendous effect on schooling and learning. In more recent years computers and the Internet are changing the way we think about education.

Modern project-based learning is based on the constructivist philosophy. Consequently it is important that a review of literature on global project-based learning include a brief discussion of the major contributors to the constructivist philosophy.

In 1916 John Dewey wrote *An Introduction to the Philosophy of Education* (republished in 1922 by the Macmillan Company) in which he outlined his theory of the role of education in a democratic society. He viewed education as a formative, social process

that actively engages the learner in “continuous reconstruction or reorganizing of experience” (Dewey, Ch.24, 1922)

Swiss psychologist Jean Piaget, most famous for his four stages of child development, studied several factors that influence child's cognitive development. He concluded that interactions between peers lead to cognitive conflicts that cause children to consider at another person's perspective and confront new concepts and ideas. (Presnel)

Also in the early twentieth century, Lev Semenovich Vygotsky, a Belorussian psychologist, developed his social-cultural theory of learning based on the principles that children construct their own knowledge, learning is inherently a social process, learning leads to development and language is the key to mental development. He concluded that environment plays an important part in cognition. Basically Vygotsky's theory suggests that development depends on interaction with people and the tools that the culture provides to help form their own view of the world. (Gallagher)

More recently, Lillian C McDermott, at the University of Washington studied how physics was taught. Her research question was: “Is there a corresponding mismatch between how we teach and how students learn?” She concluded, “Students must be intellectually active to develop a functional understanding...Perhaps the most significant contribution that research in physics education can make to the improvement of instruction is to underscore the importance of focusing greater attention on the student...Meaningful learning, which connotes the ability to interpret and use knowledge in situations different from those in which it was initially acquired, requires that students

be intellectually active. Development of a functional understanding cannot take place unless students themselves go through the reasoning involved in the development and application of concepts. Moreover, to be able to transfer a reasoning skill learned in one context to another, students need multiple opportunities to use that same skill in different contexts. The entire process requires time. (McDermott, 1993) Her research supports the concept that a constructivist approach to learning or project-based learning better engages students in a real learning process than more traditional approaches.

Out of these philosophies, theories and research grew several educational organizations that support project-based learning in schools. Some of these organizations include, the Buck Institute, Co-nect, the Virtual Schoolhouse, PBLNet, WestEd and the Challenge 2000 Multimedia Project.

One of the best project-based learning resources is the Buck Institute for Education in Novato, CA. It is a research and development organization studying the impact of problem and project based instruction and technology on teaching and learning. Simply put, the Buck Institute defines project-based learning as students as autonomous learners being engaged in investigating compelling ideas that result in real-world outcomes. (Buck Institute)

Co-nect is an organization based in Arlington MA that was formed from the New American Schools Development Corporation (NASDC). It's mission is to foster school designs that would help local communities create "break-the-mold" schools using

replicable strategies that could then be leveraged to help improve educational achievement for students nationwide. (Co-nect) When the Autodesk Foundation, another organization that supported project-based learning, ended, Co-nect continued its annual Project Based Learning Conference.

The Virtual Schoolhouse is an online compendium of project-based learning practices from across the United States showcasing exemplary work and helping educators make project-based learning part of their own practice. It advocates the Six A of Project-Based Learning: Academic rigor, authenticity, applied learning, adult connections, active exploration, assessment practice. (Virtual Schoolhouse)

WestEd is one of the Regional Educational Laboratories created by Congress in 1966 as a nonprofit research, development, and service agency to help improve student learning (WestEd) One of WestEd's projects is the Exemplary Projects for Project Based Learning Web site. (PBLNet) The purpose of the Exemplary Projects Web site is to provide motivation and support for teachers to get involved with Project-Based Learning (PBL). According to the information on this site, "...research has shown, and teachers who use PBL agree - one of the most interesting, efficient, and meaningful ways to cover the curriculum, teach the standards, and address individual learning styles is through the use of integrated, authentic, projects." (PBLNet)

Bob Pearlman former director of the Autodesk Foundation in Novato, CA and former Director of Education for Joint Venture Silicon Valley in San Jose Ca. Has founded and

currently moderates an online newsletter entitled PBLNet. The newsletter helps connect project-based learning educators so they can share ideas and resources.

Challenge 2000 Multimedia Project was a five-year Federal Technology Challenge Grant based on the principles of project-based learning supported by multimedia. It was cited as one of two Exemplary Educational Technology Programs by the U.S. Department of Education's Educational Technology Expert Panel. (Challenge 2000)

Although the above-mentioned institutions, research, concepts, and theories do not directly address global project-based learning, the concept of global project-based learning is founded upon the belief that children learn best when directly interacting with others in the learning process. Perhaps the best work to date on global project-based learning has been done by Kiyomi Hutchings, founder of the Teachers International Exchange and Mark Standley, University of Alaska. Their book, *Global Project-Based Learning with Technology* asserts “Project-based learning is an instructional methodology, a strategy used in the business worlds, and an entire planet in the solar system of educational pedagogy.” (Hutchings and Standley, 2000)

Rationale

The rationale behind global project-based learning is to give students to opportunity to become aware of and appreciate each other’s cultures, languages, and religions so that they will develop positive working relationships around a common goal and develop an empathy for peoples from other parts of the world. Ultimately this multicultural

understanding and empathy will promote a healthier environment, better living conditions for all, and worldwide peaceful relationships. Peace and prosperity in the 21st Century depend on increasing the capacity of people to think and work on a global and intercultural basis. As technology opens borders, educational and professional exchange opens minds. (Institute of International Education)

Internet and other emerging technologies make collaboration and communication much more possible than ever before. Rapid advances in information technology and telecommunications (IT & T) are impacting on a changing world in which boundaries, whether they are at local, national and international levels are now less clearly marked. (Li & Walker, 1999) It is time for educational institutions to use these technologies to reinvent themselves to meet the demands of a global economy and an ever-shrinking world. Robert Rutan in his book *Business, Leadership, and National Cultures* This new, borderless economy is changing faster than our ability to manage it. For companies to thrive, they must learn to excel in a multicultural world. (Rutan, p. 20) Consequently it is imperative that the world's educational institutions meet this challenge head on.

The question, then, becomes how can our classrooms best prepare our students to live and work in this emerging global economy? Our students must learn to work collaboratively with students in other countries and with students in other parts of the United States because they must develop global literacy skills in order to work within the global economy.

Robert Rutan identifies four key global literacies in his book

1. Personal Literacy: Understanding and valuing yourself
2. Social Literacy: Engaging and challenging others
3. Business Literacy: Focusing and mobilizing your organization
4. Cultural Literacy: Valuing and leveraging cultural difference

According to Rutan workers and leaders in this new global economy must become globally literate. (Rutan, p. 29)

If we also look at the SCANS Report (*Secretary's Commission on Achieving Necessary Skills*) we will find that it states that the following skills are necessary for workers:

- A. Creative Thinking--generates new ideas
- B. Decision Making--specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
- C. Problem Solving--recognizes problems and devises and implements plan of action
- D. Seeing Things in the Mind's Eye--organizes, and processes symbols, pictures, graphs, objects, and other information
- E. Knowing How to Learn--uses efficient learning techniques to acquire and apply new knowledge and skills
- F. Reasoning--discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem. (Academic Innovations)

Based on the SCANS Report and Rutan's research, it seems obvious that our classrooms need to help our students meet the challenges of working in a global economy. Global Project-Based Learning is an excellent way to do this.

Hutchings and Standley in their book *Global Project-Based Learning with Technology* define global project-based learning as:

- students learning in new and unique ways by overcoming language and cultural barriers
- the process of overcoming these barriers in global teams allows students to value diversity in members, learn problem-solving techniques, and incorporate new thinking styles
- technology integrated into project work and team member communication is an important tool for lowering barriers of time, language, and distance to allow teams to communicate and build relationships
- a powerful tool to accommodate authentic, student-centered learning, and helps prepare students for the work world
- new methods for teachers to reach out and effectively connect students with students from diverse groups based on an increase in minority language students in North America, and a global economy require
- a natural way to involve businesses and community members representative of global project members (language, culture, and country) to support the work of the team (Hutchings and Standley, p. vii)

Advantages and Disadvantages of Doing Projects with Global Partners

Standley and Hutchings list the following advantages:

- Shows how language differences can be a teaching tool
- Allows students to think and act outside their country's educational parameters
- Provides a practical way to teach the value of diversity in schools
- Gives teachers a tool for diverse students within a school to work together
- Provides a model for involving parents and community members from minority language groups into school projects
- Allows emotional, intellectual, and personal growth through direct experience with other cultures
- Provides students a chance to learn different problem-solving strategies
- Prepares students for global literacy
- Presents the challenge to make Web-based technology work internationally
- Puts students in charge of their own understanding of global perspectives
- Gives students the ability to act on the desire for global peace or international relationships
- Builds bridges between diverse language or culture groups within a community (Hutchings & Standley, p. 4)

Global projects are exciting for both teachers and students. When you do a project with a partner class from another country, state or community you enrich the lives of everyone

involved in the project while giving students the opportunity to develop the skills necessary to live and work in a global economy. Global projects are empowering. Mark Warschauer, Vice Chair, Department of Education University of California, Irvine, in his 1997 study of language classrooms using computer mediated collaborative learning concluded that his research data suggested that synchronous online discussion promoted collaborative learning in foreign language and language arts classrooms. (Warschauer, 1997)

Standley and Hutchings list the following disadvantages:

- Requires extra work to overcome language differences
- Distance barrier can be costly
- Dealing with time differences for GPBL (global project-based learning) team communication can be difficult
- Takes time and patience to stay open to diverse ideas and options
- Cross-cultural differences create unintended misunderstandings
- Not always natural or comfortable to act "outside the box" for global projects.
- May have to overcome xenophobic attitudes from administration or community
- Foreign laws may require special care in not putting students at risk
- Connecting through phone or technology systems between foreign countries can be difficult (Hutchings & Standley, p. 5)

Collaboration between teachers at one school can be difficult even when teachers and students see each other face to face daily. Collaboration with a class at another school in

your own community can also provide multiple challenges. The further you move away from your own classroom to find project partners the more obstacles you will need to plan for and overcome. The most important ingredient for overcoming these obstacles is desire. If all project partners have a strong desire for the project to be successful, it will be.

Global Literacy

Global literacy is an essential skill for the twenty-first century. The events that take place in even the smallest part of the world potentially affect people all over the world. It is critical that we educate children to be responsible global citizens. Foreign exchange programs, pen pal exchanges and foreign language, world culture and history courses have traditionally focused on creating globally literate students. This global education can be defined as “the lifelong growth in understanding, through study and participation of the world community and the interdependency of its peoples and systems – ecological, social, economic, and technological (Sny, 1980)

Modes of Global Learning

Because the world is fast becoming one common society - a "global village" - global education should be part of the curriculum of every K-12 school. It is not just the politically correct thing to do. Students must know how to cope in a pluralistic society and how to relate to diversity. In fact, training students to participate in a diverse society should be as much a matter of conscience for schools as is their concern to prepare students to become competent business leaders, doctors, and lawyers. (Hendrix)

One of the earliest forms of global project based learning was email , epal, or keypal exchanges. Often these projects were designed to facilitate foreign language learning.

Manuela González-Bueno at the University of Kansas used Electronic Dialogue Journals freshman English composition classes for Level1 English Language learners, ESL classes, and foreign language classes to help students to become successful writers.

Using email her students established a written "dialogue" with the instructor about a topic of their choice. The instructor modeled correct language when responded to the students' writing. She concluded, The Internet offers an endless list of pedagogical possibilities to both language teachers and learners. As educators, it is our responsibility to take advantage of these opportunities and to offer our students the best and most effective educational tools to motivate them and enhance their foreign language skills. (Gonzalez-Bueno, 1998)

Epal or online email partnerships continue to flourish. Barbara Diew, English foreign language teacher and coordinator of the Foreign Language Department at Lycée Pasteur in São Paulo, Brazil includes a comprehensive list of ePal projects on her Curso Experimental Bilingue Web site. According to Dieu, E-mailing and online projects make it possible for people to communicate around the world much more quickly make friends , practice writing and get to know other countries and cultures. (Dieu)

In a project similar to the González-Bueno project, the author of this paper participated in an online mentoring and tutoring program with Ted Nellen's class at Murray Bergtraum High School in New York City called CyberEnglish. Mr. Nellen posted an email on the WWWEdu listserv asking for educators from all over the United States to adopt one of

his students as a mentor and writing tutor. His students used older 386 PC computers and raw html coding to post their writing assignments in password protect folders on his server. Each mentor/tutor was given the log in name and password for his/her student's folder. (Nellen T.) This author was assigned an 11th grade English Language Learner from Bangladesh. After reading the student's writing, this author and her student exchanged several emails discussing how the student's writing might be edited. Over the course of the school year, this student's writing noticeably improved not only in grammar and spelling, but also in depth and quality. Although these two studies are not really examples of global project-based learning, they do highlight how the Internet can be used to improve student learning.

Roseanne Greenfield at the Hong Kong University School of Professional and Continuing Education, in her qualitative case study of collaborative email exchanges between student secondary ESL students in Hong Kong with an 11th grade English class in Iowa, concluded that her research was consistent with other similar research in the finding that students must go past the keypal stage and engage in significant collaborative projects using a task-oriented approach with a final product. (Greenfield, 2003)

The Internet teems with online projects teachers and their students can join. A few of these are:

- IEARN (<http://www.iearn.com>): International Education and Resource Network is a non-profit organization that helps students to use the Internet and other technologies for collaborative educational projects that both "enhance learning

and make a difference in the world." There is a \$/100 per year teacher or \$280 per year school fee to join iEARN. The projects are outstanding.

- NASA Quest (<http://quest.arc.nasa.gov/>): NASA sponsors projects on a variety of science topics that include WebCasts and online chats. All based on K-12 curriculum.
- KidLink (<http://www.kidlink.org/>): KidLink is a Norwegian non-profit organization that provides a global dialog for elementary through secondary school students around the world that gets kids to talk to each other about the common experience of childhood in often very different circumstances. Personal membership is \$25 per year.
- Global Schoolhouse (<http://gsn.org/>): This is a free service to teachers that sponsors a variety of projects including projects that have come out of the events of Sept. 11, 2001.
- SchoolLink (<http://www.schoollink.org/>): SchoolLink project took place between schools in the U.S. and Japan. It is currently not active, but their online registration forms says they will send you information when the project becomes active again. There are links to their project that might give you project ideas.
- ThinkQuest (<http://www.thinkquest.org/>): Thinkquest is an international competition that helps students set up international student collaborative teams create web based projects.
- Global Classrooms
(<http://www.globalclassroom.org/collaboration/globalprojects.html>): This site hosts a variety of international projects teachers and schools can join.

- Project Exploration (<http://www.projectexploration.org/>): This project connects students with paleontologists in the field.
- Cranes for Peace (<http://www.he.net/~sparker/cranes.html>): This project is based on the book Sadako and the Thousand Paper Cranes. The project began to send paper cranes from around the world to Hiroshima for the 50th anniversary of the dropping of the atomic bomb.
- World Peace Project (<http://www.sadako.org/>): The Sakako Peace Project is a project dedicated to peace education for children.
- Digital Divide Network
(<http://www.digitaldividenetwork.org/content/sections/index.cfm>): This network is sponsored by the Benton Foundation, a non profit organization. Membership places you on a very active listserv in which educators from around the world explore issues of the international digital divide. From time to time opportunities to participate in global projects are discussed.
- Jason Project (<http://www.jasonproject.org>): This is a project you can join. It was founded by Dr. Robert Ballard who discovered the Titanic. Each year Dr. Ballard takes a team of research scientists to a different location to study environmental issues. The Jason Project connects classrooms with these scientists through a multidisciplinary curriculum. Classes can visit local pin sites to telecommunicate with the research team. In the San Francisco Bay Area the pin site is NASA Ames in Mountain View, CA. The Jason Project used to be free including curriculum and training, but there may be a fee to join now.

- Teachers International Exchange (<http://www.ct-sv.com/tieE.htm>): The TIE has brokered projects between schools in Japan and the United States. The site has a variety of resources for people interested in doing global projects.
- Virtual Web Home--Curriculum Based Projects and Resources (http://www.officeport.com/enrich/resources/jharris/judi_harristop.htm): This site maintained by Judi Harris at the University of Texas has a variety of project resources, ideas, and locators for intercultural email, ePals, telementor, keypals, penpal and virtual handshake projects.
- ASTL (<http://www.edugal.org.il/teleproj/default.htm>): Art Science and Technology of Learning brokered several projects and trained the teachers involved in those projects. Review the projects and other resources on this site, and contact the teachers who created these projects
- KidProj (<http://www.kidlink.org/KIDPROJ/>): KidProj is a part of the KidLink site that has a variety of projects and email forums you can join.
- Global Connections (<http://www.learningspace.org/ric/gprojects/ricglobal.html>): This site has information on how to form a KeyPals project.
- SofWeb Global Classroom: SoftWeb lists a variety of global projects you can join.
- Tapped In (<http://www.tappedin.org>): This is a multi-user virtual environment that houses a variety of resources (both human and web) and hosts After School Online discussions for educators around the world.
- African Edventure (<http://www.african-edventure.org/>): This trek across Africa is a project teachers can join.

- Virtual Schoolhouse (<http://virtualschoolhouse.visionlink.org/index.htm>): This site has information on project-based learning plus examples of exemplary projects.
- EPals and Online Projects (http://the_english_dept.tripod.com/epals.html): This site has links to ePal and other projects including WebQuests. (Ullah, L.)

Implications of and for Global Project-Based Learning

The advent of Internet technologies make it possible to better facilitate global literacy by connecting students in ways that were never before possible. (Ullah, L.) With the rapid development of information technology (IT) and the Internet spread, it is widely accepted that computer and information communication literacy has become extremely important, and will play a major part in everyone's lives in the future. (Cristea & Okamoto, 2001)

International collaborations have the potential to introduce students to business mores and conditions in other countries. Using networked technologies, students from different cultural and language groups can work together on joint projects regardless of geographical location or time zone. (Haddow & Klobas, 2000)

As teachers explore the possibilities of online international student collaborations and projects there is a greater need to teach cultural sensitivity as part of the curriculum. The acceptance, use, and impact of WWW sites is affected by the cultural backgrounds, values, needs and preferences of learners. (McLoughlin & Oliver, 2000) Application of the multiple cultural model requires a global and inclusive perspective, sensitivity to cultural difference and an appreciation of the numerous ways in which culture influences

learning. Instructional designers need to consider the philosophical and pedagogical under-pinning of goals, objectives, content and instructional activities, and incorporate not one, but multiple pedagogies according to learner needs. (McLoughlin C., Oliver, R., 2000)

Not everyone sees global education as positive. Kate Wilson at the University of Canberra holds the opinion that global education is imperialist by nature. (Wilson)

In the last Forum, there were several comments about 'International Education' as a euphemism for the crudely commercial but more transparent phrase, 'exporting Western education' or even the more politically provocative term, 'educational imperialism'. If we want to use the term 'international education' we need to take a square and honest look at the realities it masks.

What are the goals implied by the term 'international education'? Most people involved in the field would probably entertain a deep-seated ideal of international education leading to increased understanding between national groups. Many argue that such international understanding is contributing to a new global culture, which seems to be replacing separatist constructions of culture. We are finding that cultures across the world have more and more in common. Further, many people counter charges of the imperialistic spread of the English language through international education, by claiming that English is now a language of wider communication, the domain of native and non-native speakers alike the world over, rather than the predominantly Anglo Saxon countries of the world, such as Australia, Canada, Great Britain and the United States.

The goal of increased international understanding implies a mutual process of learning. However, if we consider the reality of 'international' education, we will see that this is far from the case. International education is a one-way street. A high proportion of the youth of client countries are being socialized into the cultures of the "providers", nearly exclusively Anglo Saxon countries, whereas a tiny minority of the young people of the provider countries take up the opportunity to attend university abroad. (Wilson)

Following this line of thinking, it is interesting to note that Rod Paige, U.S. Secretary of Education alleged: The United States looks forward to working together with our APEC partners, on these human capacity building projects to make our Pacific Rim economies a fully functioning, knowledge-based community. (Kozberg) APEC is a committee of 21 Pacific Rim countries that was founded in 1989 to promote economic growth in that region. APEC partners refers to The Asia-Pacific e-Learning Alliance. This alliance is a collaboration between 10 major computer companies from the U.S and Asia working with APEC partner countries. The Alliance's mission is to improve education and improve productivity through greater use of web-based learning opportunities. (Kozberg)

One of their projects is The e-Language Learning Project. This project's goal is help students and educators in the APEC region use the Internet to learn a second language such as English, Chinese and students skills are essential for economic success in a global economy and creating mutual understanding among people The Asia-Pacific e-Learning Alliance sees itself as a prototype for education in the 21st Century.

Another criticism of global-project based learning is its dependence on computers and the Internet. (Kozberg)

Although critical of the potential overuse of computers in education Jennifer Burg and Beth Cleland at Wake Forest University do indicate, Computers are not a good substitute for real-world experience. However, they are valuable tools for activities that couldn't be done otherwise, or for activities that are done better with computers such as communication that would otherwise be difficult or impossible, such as long-distance conversations among students of different languages and cultures, or student interactions with artists and scholars (Burg and Cleland).

In April of 2000, the U. S. Secretary of Education acknowledged "The Growing Importance of International Education" and encouraged educators to use the Internet to foster "classroom-to-classroom exchanges that allow young people to learn about each other from each other." Notable initiatives in this area include The Alliance for Global Learning (www.global-learning.org), ePALS (www.epals.com), iEARN (www.iEARN.com), Intercultural Email Classroom Connections (www.teaching.com/iecc/), International School Partnerships in Technology sponsored by UNC's Center for International Understanding (www.ga.unc.edu/NCCIU/ispt/), and The Global Schoolhouse (www.lightspan.com). (Burg and Cleland)

Conclusion

Times have changed but the fundamental principles of education guiding our practices still remain the same as they did throughout centuries. (Shrestha, 1997) If global project-

based learning is to be a successful educational practice will need to be grounded in sound educational pedagogy that can bridge the educational differences between cultures. Although new in terminology and concept, the idea of projects or educational exchanges between students on a global scale is not new. The Internet has, however allowed for a new way to think about global educational projects.

Chapter Three: Methodology or Procedures

Introduction

The online Global Project Based Learning course is a project in progress. The project was originally conceived after I completed a project on water pollution with my students and students at Idalina High School in Sao Paulo, Brazil. The project was selected as one of Intel's ten finalists for the Intel Award. Intel was looking for a replicable project to fund. The proposal submitted to Intel involved a collaboration between the Challenge 2000 Multimedia Project, DesignWorlds for Learning and the Santa Clara County Office of Education. The design for this proposed project has been discussed in Chapter One.

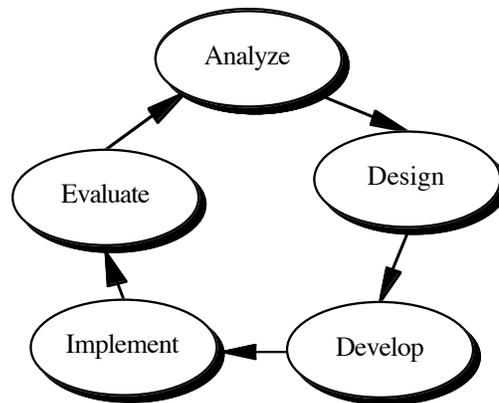
In July-August, 1999 I was invited by Kiyomi Hutchings, founder of the Teachers International Exchange to co-present two workshops with her and Mark Standley on global project based learning for teachers at Mukagawa Women's University in Kobe and in Kumamoto Japan. When I returned from Japan in August, 1999 I began working at the Krause Center for Innovation at Foothill College in Los Altos Hills, CA. Because of my passion for global project-based learning, and because of my background and training both at Migal Institute and from Kiyomi Hutchings and Mark Standley, authors of *Global Project-Based Learning with Technology* (Hutchings & Standley, 2000) I decided to author an online LINC course on global project-based learning in the hope of continuing my efforts to broker, train, mentor and coach teachers to do global projects with their

students. This project is just one step in a process I plan to continue to pursue.

Ultimately, my goals include finding funding to more extensively broker, train, mentor, and coach teachers from around the world to do meaningful curriculum-based global projects with partners from other countries.

Design of the study/project

The ADDIE Design Model works well for this project. Because this is an ongoing project that has been conceived, designed, developed, implemented and edited continually during the past two years the process of analysis, design, develop, implement and evaluate becomes a formative process.



Analysis

1. Problem Statement

As discussed in Chapter 1 the problems statement is: With the advent of Internet technologies in our schools comes the wonderful opportunity to expand the curriculum to involve collaborative projects between students in different schools and different countries. In order for teachers to be engaged in designing, developing and implementing

curriculum-based online global projects that improve student learning they need to be trained, mentored and coached.

2. Needs Assessment

Because we live and work in a global economy our students must learn to work collaboratively with students in other countries and with students in other parts of the United States because they must develop global literacy skills in order to work within the global economy.

3. Learner Analysis

The learners in this project are first the teachers who take the global project-based learning course, and ultimately their students and the teachers and students with whom they work on their projects.

The teachers I hope to attract will come from a variety of countries. The ultimate goal is to match teachers with similar content and project ideas and use the course to help train these teachers to collaboratively write their project plans. I envision this course as the first in a series of courses to help support teachers who want to implement global-projects with their students.

Most of the teachers who have currently taken or are taking this course are from the San Francisco Bay Area. Ultimately the goal is to attract teachers from around the world so

that this course can be built into a more powerful model for brokering, training and mentoring and coaching teachers and their students.

4. Project Overview

What Is	Desired Outcomes
Standards-based curriculum and testing program in California and many other U.S. states	Students in global project classrooms meet and exceed standards.
Some teachers (Bay Area and elsewhere) are trained in project-based learning and are effectively doing curriculum-based projects with students.	An increased number of teachers will be trained in global project-based learning and will implement meaningful curriculum-based projects with their students and their global partners.
Enrollment in the global project-based learning class has been small and local.	Twenty or more teachers from around the world per quarter will take the global project-based learning class.
Online collaboration and training is possible if teachers from around the world will be able to take the global project-based learning course	Funding for real global project-based learning training, mentoring and coaching that includes both face-to-face training , mentoring and coaching as well online training, mentoring and coaching
The current global project-based learning course is text based involving. The teachers taking this course have reported that there is too much reading.	Multimedia elements will be added to the course to make the learning more comprehensible.

5. Recommended Solution

My initial solution has been to create this online global project-based learning course.

Specific Objects for this course are:

- To teach teachers to use plan an Internet-based project either with a partner in another location or by joining and existing project that incorporates the

tenants of project-based learning to improve learning and student achievement..

- To help teachers mutually develop collaborative web-based projects as powerful learning tools that will provide their students with the information literacy skills they will need to live and work in the twenty-first century.
- To teach teachers to use a variety of Web tools with their students
- To change the way the participating teachers think about and plan curriculum so that learning is a powerful and exciting experience for their students.

Currently I am involved with the formative evaluation process and the constant editing and tweaking of the course. Once the course has been edited and improved to my satisfaction, I will begin to find a greater audience for the course and look for funding that will allow me to include at least one face-to-face meeting between partner teachers either in real time and space or by video conference. The funding I will seek will also allow me, and eventually other mentors and coaches to follow up with the project teachers both online and by traveling to partner schools for face-to-face mentoring and coaching to assure the success of the projects.

Design

The Design of the global project-based learning course has been based upon the following examples:

- a. The ASTL model from Migal Galilee Technological Center, Kiryat Shemona, Israel

- b. The Challenge 2000 Multimedia Project Model
- c. Hutching and Standley's book *Global Project-Based Learning with Technology*
- d. Online curriculum development techniques I learned by working with Classroom Connect's Connected University and through courses I've taken from Foothill College's Global Access training for instructors.

When I began to design the curriculum I wanted teachers to have a deep understanding of the pedagogy behind global project-based learning as well as the opportunity to see many rich examples of successful projects. Because the course would be taught online and because it was assumed that most teachers might not be ready to find partners and implement a self-created project it was decided to give teachers who took the course the option of joining an existing global project as a good entry point. The design was discussed and argued in detail with Dr. Ted Kahn who would be teaching the class.

While I continue to agree with Dr. Kahn, who has been my mentor and coach for several projects, that teachers need to learn to create their own projects with their partners, and that the projects need to be followed by an ongoing mentor and coach, I knew that initially this would not be feasible due to time and money constraints. It is still my plan and hope to extend this course to allow for this.

Development

The initial writing of this course occurred in the summer and fall of 2001. Dr. Ted Kahn, the course instructor, helped edit the course for content, and Jackie Kawashima, Oak Grove School District's technology coordinator, helped edit for mechanics. The original course has continued to be edited over time. The edited original course is online at <http://www.lullah.com/globalpbl/>. During the spring of 2002 I met with Cindy Vinson

from Foothill College's Educational Technology Services Department to discuss creating a template for all of the LINC online courses. The purpose was to give all LINC online courses a common look and feel. The format of the global project-based learning course was chosen as the basis for this template. With the help of Jackie Kawashima I began moving the course's content into the new template. The new version of the course is posted at <http://www.lullah.com/gpblnew/>. This process is not yet complete. I am now working with Ruhi Vasenwalla Khan, my intern from Stanford University to add sound files, QuickTime movies and animations to the course to make the content more interesting and comprehensible. Assessments by the teachers who have taken the course have indicated that this is needed.

I have also created a project-planning template for this course that is currently posted at <http://www.lullah.com/gpblplan/>. This template will be edited and integrated into the course, but could be a self-directed global project planning guide.

Implementation

The course was first taught Fall Quarter 2001. It has been taught 5 times

Quarter	Number of Teachers Enrolling in the Course	Number of Teachers Completing Course
Fall 2001		
Winter 2002		
Spring 2002		
Fall 2002		
Winter 2003		

Evaluation

Ongoing evaluation has included surveys of the teachers who have taken the course and feedback from the instructor. Additionally information on how many teachers have participated in the course has been tracked.

The formative evaluation process includes suggestions for improving the course, information on project implementation. At this point, because the course is being edited and improved, evaluation is only formative.

The results of the project evaluation will be presented in the next chapter.

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