1-1-2009

Administrative Perspectives on Technology Integration: the Globaloria: MyGLife Program in West Virginia

William E. Chapman Jr.
wchapman@access.k12.wv.us

Administrative Perspectives on Technology Integration: the Globaloria: MyGLife Program in West Virginia

William E. Chapman Jr., Ed. D.
Marshall University
College of Education and Professional Development

Dissertation submitted to the Faculty of the
Marshall University Graduate College
in partial fulfillment of the
requirements for the degree of

Doctor of Education
in
Educational Leadership

Committee Chair, Barbara L. Nicholson, Ph.D.
Michael L. Cunningham, Ed. D.
Rebecca H. Goodwin, Ed. D.
Jerry Jones, Ed. D.

Huntington, West Virginia, 2009

Keywords: Administration, Technology Integration, Activity Theory & Vygotsky

ABSTRACT

Administrative Perspectives on Technology Integration: the Globaloria: MyGLife Program in West Virginia

The reputed benefits of using technology in schools have been the topic of many research studies. When the World Wide Workshop Foundation implemented their Globaloria program into a group of pilot public secondary schools in West Virginia in the fall of 2008, another opportunity for study was created. The perceptions of principals relating to: 1) the effect(s) of the Globaloria program on students' academic outcomes; 2) the purpose(s) of the program; 3) the principal's role in the program 4) the benefits; and/or 5) the liabilities of having the program in their schools were examined in this mixed-method study.

Analysis of student data indicated that there was no statistically significant change in students' academic outcomes following the program's implementation, although data were available for only the year immediately prior to and the year immediately after their enrollment in Globaloria . Principals indicated that they believed the program had an overall positive effect upon students' academic outcomes, behavior and attendance. A majority of the participating principals also reported that they would like to continue the program in their schools. These findings were viewed through Lev Vygotsky's (1978) cultural-historical activity theory in order to generate conclusions and recommendations for further study.

DEDICATION

This work, the culmination of one dream and the birth of another, is dedicated to my parents, W. Ervin and Allene Chapman. They have provided encouragement through all phases of my education. Though my father was only able to remain in school to complete his eighth grade year, he managed to pass his love of reading and learning to my brother and me. Through his encouragement, his children have risen to become a federal court judge and a doctor of education. Even though he did not live to see the completion of this work, his influence continues to be felt. My mother has emphasized learning and achievement for my entire life, and she has waited many years to introduce her son the doctor.

The work is further dedicated to Dr. Barbara Nicholson, Doctoral Committee Chair, orator, editor and guide, words alone will never fully express the magnitude of the feelings of gratitude and respect that I hold for your unflagging support and guidance. If my commitment to the work waned, you found just the right way to reinforce my determination to succeed.

ACKNOWLEDGEMENTS

The researcher would like to recognize the contribution of several individuals from the school system in Roane County, West Virginia who assisted in this educational journey; Mrs. Paula LeMasters, Mr. Ross D. Boggs, Mrs. Doris Weekley, Mrs. Jeannie Bennett-Wade and Mr. Stephen Goffreda for helping me find the time and the motivation to complete this work.

Many thanks are extended to the members of my doctoral dissertation committee, Dr. Michael Cunningham, Dr. Jerry Jones and Dr. Rebecca Goodwin, for their guidance, insight and support. This work would not have been possible without the grounding provided by the other members of the Marshall University Graduate College faculty who provided opportunities to learn in many diverse courses and venues; Dr. Teresa Eagle, Dr. Jack Yeager, Dr. Powell Toth, Dr. Lisa Heaton, Dr. Sam Securro and Dr. Linda Spatig.

TABLE OF CONTENTS

TABLE OF TABLES

TABLE OF FIGURES

CHAPTER ONE

Since the first desktop computers were moved into classrooms in the 1980s, significant public funds have gone into the effort of providing hardware, software and internet access to schools across the United States. Estimates have indicated that the spending for technology in the nation's schools will exceed 56 billion dollars by 2012 (Nagel, 2008). After almost three decades however, there was still some question about the effect(s) of technology on student learning. Several researchers argue, in fact, that educational technology had not lived up to its billing as the most effective instrument for bringing significant positive change to education (Ginserb & McCormick, 1998).

Research to support the positive effects of technology usage on student achievement has been less forthcoming, however, than the funding. While some studies did find statistically significant achievement gains for students working with technology (Martindale, Pearson, Curda, & Pilcher, 2005), others indicated no significant difference between students in treatment and non-treatment groups (Cuban, 2001, Cohen, 2000).

Sherry, Billig, Jesse and Watson-Acosta (2001) attributed student achievement through the use of instructional technology to the pervasive relationship between motivation and metacognition. In other words, the enthusiasm of the students for using the technology allowed them to interact with information and learning on a more stimulating level, leading to higher levels of retention of information. The use of technology in education has been studied in varying ways and from various perspectives since its introduction in classrooms and an extensive review of extant research was provided in Chapter Two. Essentially, however, the findings of research focusing on the relationship of technology usage to academic outcomes have been mixed at best,

providing little conclusive evidence to guide policymakers in general and school principals in particular in making decisions regarding technology implementation. This variability in results leads to a clear question regarding such programs. What, if any, effect does it have on the target population?

Technology has, nonetheless, become such an important consideration in education that the following goal was included in the No Child Left Behind (NCLB) Act of 2001,

> …the combining of technology resources and systems with educator training and curriculum development to fulfill the primary goal of enhancing learning and increasing student achievement. A secondary goal of this federal initiative is to cross the digital divide by ensuring that all students are technologically literate by the end of ninth grade (Public Law 107–110, 2002, p. 1672).

In the fall of the 2007 school year the Globaloria project, a technology integration program, was launched in selected public middle and high schools in West Virginia to promote students' learning of game design software in a problem-based learning environment within their regular public schools. This study was designed to assess the benefits or drawbacks of this project in the pilot schools, specifically from the viewpoint of the school administrator. An attempt was made to situate the introduction of the project within the timeline of the state of West Virginia's decision to focus upon 21st century workplace skills.

Overview of the Globaloria: MyGLife Project

On November 14, 2005, West Virginia became the second state to join the Partnership for 21st Century Skills. The partnership was a national advocacy group based in Tucson, Arizona that represented business, education and policymakers and was intended to help ready students in the United States for the demands of the workplace of the future. The 21st century skills programs in West Virginia addressed seven key components are:

1. frameworks for classrooms, schools and school systems;

2. rigorous content standards; instructional guides for integrating 21st century content and skills;

3. technology tools;

4. curriculum standards for 21st century learning skills and technology tools;

5. technology integration specialists;

6. the West Virginia Institute for 21st Century Leadership; and

7. professional development for West Virginia Department of Education (WVDE) staff and key stakeholders (Partnership for 21st Century Skills, 2008).

According to the West Virginia Department of Education (2008, p. 29) one of the first steps that the West Virginia Department of Education (WVDE) undertook relating to the Partnership was to refine the state's Content Standards and Objectives (CSOs) to reflect 21st century skills. In general, the department envisioned a graduate who would be proficient in core subjects and knowledgeable of 21st century content, including skills which encompassed information and communication skills, critical thinking and problem solving, and personal and workplace productivity. The individual was also to be

proficient with technology tools and be able to apply and demonstrate learning in real-world situations.

With this new vision of a successful graduate, schools across West Virginia began to look for the means to increase their students' skills in order to address the expanded requirements of the WVDE. For some schools, a venue presented itself in the form of an initiative made available by the World Wide Workshop Foundation called Globaloria. Within the umbrella of the Globaloria program were components focused on specific topics or curricular areas including MyGLife which focused on global awareness, MySLife relating to science, MyHLife for health, MyRLife for human rights, MyALife for art and MyMLife for mathematics. These curricular components were scheduled to be made available at different times for pilot testing. The first component to be made available was the global awareness component, MyGLife (World Wide Workshop Foundation, Globaloria-frequently asked questions, p. 2).

The Globaloria Program

According to Caperton, Sullivan and Oliver (2008), the World Wide Workshop Foundation (WWWF) was established in 2004 by Dr. Idit Harel Caperton as a non-profit spin-off of her successful company, MaMaMedia. The Globaloria program of the WWWF utilized both scalable and virtual edu-social networks to teach students to interact productively with technology and to acquire and demonstrate appropriate workplace skills. Scalable social networks were ones that can be readily expanded to incorporate more complex tasks or increasing numbers of users, such as Sparta Insight and Amazee, while virtual social networks referred to online communities or groups such as Facebook and MySpace. The program was rooted in the idea that training students to

construct online games and simulations, while teaching those same students self-learning and creative and collaborative work habits, would lead to enhanced and more meaningful learning. The developers also maintained that by interacting with traditional academic content in a collaborative online environment, students gained a deeper understanding of that content.

The Globaloria networks were designed to promote participation and to utilize open-source technology, which was made available for users to adapt and refine for their own purposes by the benefit of an open copyright (Caperton, Sullivan, & Oliver, 2008). Globaloria also featured simple administrative tools designed to make the networks easily customizable to meet the needs of diverse consumers. The skill level required to operate within the Globaloria program was described as "advanced beginner" to "advanced intermediate," and participation in the program allowed students with basic technology and leadership skills to extend their skills in these areas. Those same learners, ideally, were to develop new professional capacities for leadership in both the global economy and the digital world (Caperton, Sullivan, & Oliver, 2008).

According to Caperton, Sullivan and Oliver (2008), the program's designers described Globaloria's programming platform as being grounded in the constructionist theory of learning. Papert and Caperton (1991) defined constructionism as a blending of constructivist theory, which described learning as an ongoing construction and reconstruction of knowledge, with the belief that learning was more meaningful when it was part of an activity in which the learner experiences the creation of a meaningful product. Both elements could be seen in Globaloria's conceptualization of MyGLife. The project recognized, for example, the constructivist principle that students have already

acquired a range of technological skills and knowledge and that they can enhance their understanding of them as they access what they already know to synthesize the new concepts introduced by Globaloria. It was these processes that were engaged as participating students took on the creation of their technology products.

The Globaloria designers described their program as having been developed by incorporating case studies, analysis of process and outcomes-based research. These research tools were integrated into the program at all levels along three distinct strands: development of the technology platform, development of the curriculum, and developmental research into the students' learning and achievement (Caperton, Sullivan, & Oliver, 2008).

Caperton (2008) described Globaloria as allowing individuals in developing countries and underprivileged communities to gain understanding of Web 2.0 skills, including information access, real-time communication, publishing, and connecting to the global community. The program was both an instructional tool to develop technology and workplace skills and a vehicle for developing global awareness.

Caperton (2008) further stated that four other thematic networks were in development. The next Globaloria project to launch, MySLife (science), was scheduled for late 2007, while MyHLife (health) was to be introduced in the summer of 2008. Finally, MyALife (art) and MyMLife (mathematics) were to become available in the winter of 2008 and the spring of 2009.

According to Caperton, Sullivan and Oliver (2008) the MyGLife (global) program was launched in Netanya, Israel with 38 Arab, Jewish and Russian immigrant students from five Israeli cities. By 2007, the Globaloria program had expanded to 10 active

communities on four continents, including groups in Trinidad, the United States (West Virginia), India and Bolivia. These Globaloria participants were expected to develop skills in specific workplace and technical areas:

1. using internet media (wikis and blogs) for self-expression, communication, research and to create original contents within a virtual community of learners and mentors;
2. programming wiki media, wiki creation and social publishing, making an editable online bulletin board with text, images, hyperlinks, embedded video, sound and Flash animation files, etc.;
3. creating and using blogs effectively (using a free tool such as Blogger);
4. making original digital artifacts such as buttons, banners, illustrations, animations, photos with a computer programs such as Photoshop;
5. building and publishing a webpage, using computer applications such as FTP, HTML and CSS;
6. mastering Flash, alone and in teams, to build an original Flash interactive simulation or game, including graphics, animations, media and ActionScript, that supports a pro-social or educational topic, and publishing it to the web;
7. using XML efficiently and effectively to organize and update content in web applications and to add digital artifacts to an existing Flash game;
8. gaining knowledge of real-world practices for creating interactive projects from conception to completion, including the software project development process, creating a detailed written plan and using it to build a project;

9. honing professional livelihood skills including team work, written and visual communication and presentation, motivational practices, time management, priority and goal setting; and
10. exploring the impact of computer games, simulations, and animations on education, art, entertainment and social change.

To be able to develop these diverse technological and workplace skills, students would need to do more than simply read about them. Instead, the students would have to work in collaborative teams to create their projects, in this case video games, designed to address global issues. By placing student learning into a "real-world" situation, eventually leading to a defined product or game, the Globaloria program adhered to the precepts of constructionism (Caperton, Sullivan, & Oliver, 2008).

The Globaloria developers themselves identified potential difficulties with their program. The first was the demanding technology requirements, including six to 10 hours per week of access to a computer with a high speed internet connection as well as expensive programming software, such as Flash. The second area of concern was locating dedicated partners to assist with financing the effort. The third area of concern was that the program needed to secure instructors who would commit to this undertaking and teach in the virtual environment. These projected problems were readdressed further in this chapter (Caperton, Sullivan, & Oliver, 2008).

West Virginia's Globaloria Implementation

Caperton (2008) described six public secondary school pilot sites across West Virginia which began implementing the project during the 2007-2008 school year. These sites were selected by members of the West Virginia Department of Education. Man,

Capital and Clay County High Schools, Kasson and Clay County Middle Schools and the Randolph Technical Center launched the program in West Virginia. Fourteen educators were trained for these six sites and seventy students participated in the first year program. Pilot programs also began at the Marshall Community and Technical College and the Florence Crittenton Center for Girls, but as these two sites did not serve as traditional public secondary schools, they were not considered in this research effort.

At the beginning of the 2008-2009 school year, according to Caperton (2008), the program was expanded to include Greenbrier East, Greenbrier West and Spring Valley High Schools, as well as at Ceredo-Kenova, Eastern Greenbrier and Sandy River Middle Schools. An additional non-public site was established at the Pressley Ridge School. In the second year of the program, six additional educators were trained and a total of two hundred sixty nine students participated. It should be noted that while several additional schools joined the program in the second year, one school, Clay County Middle School did not continue to participate.

Implementation Formats

Caperton (2008) stated that the 11 public secondary school sites which participated in the second year of the program did so using a combination of delivery models. Some students participated to receive course credit in their daily schedules, while other groups participated in after-school meetings. Participating groups also differed in their grade-level composition.

Capital High School provided the Globaloria program to 27 students during the second year of the project. Nine of the students, in grades 10 and 11, participated in an after-school course for the Health Sciences and Technology Academy (HSTA). This

group met for 90-minutes twice per week. The remaining 18 students in grades 10 through 12 participated for credit in their business curriculum courses. They met for 45-minutes five times per week.

Clay County High School provided the program to two groups of nine students each in grades 11 and 12. Each group received business course credit after meeting for 90-minutes five times per week for a semester.

Greenbrier East High School provided the program to 10 students in grades 10 through 12. These students received elective credit for participating in the project during 90-minute meetings held two or three times per week for one semester.

Greenbrier West High School provided the program to 31 students in grades 10 through 12. One group of 22 students received an art course credit for meeting for 50-minutes five times per week for two semesters. The second group of nine students received social studies course credit for meeting five times per week for 50-minutes for one semester.

At Man High School, a total of 12 students in grades 9 through 12 participated. Ten students received elective credit for meeting for five 50-minute classes per week for two semesters. The remaining two students participated in one hour after-school meetings once per week for two semesters as part of their HSTA program.

Twenty-three students at Spring Valley High School in grades 10 through 12 participated in three different delivery options. All three groups met for five 45-minute classes per week for two semesters. The first group included 11 students, while the second included 19 and the third and final group accounted for three students.

Students at the Randolph Technical Center met for five 90-minute classes per week for a semester. During the first semester, 22 students participated, while three students participated during the second semester.

Ten students at Ceredo-Kenova Middle School participated in the program for five 45-minute meetings per week for elective credit. They participated for two semesters. Kasson Middle School also worked with a group of 10 students who met for five 30-minute classes per week for elective credit over two semesters. Ceredo-Kenova's students were in grades 7 and 8, while Kasson's were from grades 6 through 8.

Eastern Greenbrier Middle School presented the program to two groups of students. These two groups, which included 41 and 40 8th grade students respectively, met for five 42-minute classes per week for elective credit.

Sandy River Middle School had two groups of students in the 8th grade. The groups were composed of seven and eight individuals and met for five 82-minute classes per week one semester and five 40-minute classes per week for the second semester. Table 1 on the following page identifies implementation models in the pilot year of the program in West Virginia.

Figure 1: Implementation of Globaloria in West Virginia 2008-2009

2008-2009				Semester 1 Implementation		Semester 2 Implementation	
Pilot Location	**Total # of Educators Trained**	**Student Grade Level**	**Total # of Student Participants**	**Type of Program Offered**	**Individual or Team Work**	**Type of Program Offered**	**Individual or Team Work**
Capital H.S.	1	10-11	9	After school (HSTA) 2 mtgs/wk 90 mins/mtg	Team	After school (HSTA) 2 mtgs/wk 90 mins/mtg	Team
	1	10-12	18	For credit (business curriculum) 5 mtgs/wk 45 mins/mtg	Team	For credit (business curriculum) 5 mtgs/wk 45 mins/mtg	Team
Ceredo-Kenova M.S.	2	7-8	10	For credit (elective) 5 mtgs/wk 45 mins/mtg	Team		
Clay County H.S.	2	11-12	9	For credit (business curriculum) 5 mtgs/wk 90 mins/mtg	Individual and Team		
		11-12	9			For credit (business curriculum) 5 mtgs/wk 90 mins/mtg	Individual and Team
Eastern Greenbrier M.S.	2	8	41	For credit (elective) 5 mtgs/wk 42 mins/mtg	Team		
		8	40			For credit (elective) 5 mtgs/wk 42 mins/mtg	Team
Greenbrier East H.S.	2	10-12	10	For Credit (elective) 2-3 mtgs/wk (Alternate schedule) 90 mins/mtg	Team	For Credit (elective) 2-3 mtgs/wk (Alternate schedule) 90 mins/mtg	Team
Kasson M.S.	2	6-8	10	For credit (elective) 5 mtgs/wk 30 mins/mtg	Team	For credit (elective) 5 mtgs/wk 30 mins/mtg	Team
Man H.S.	1	9-12	10	For credit (elective) 5 mtgs/wk 50 mins/mtg	Team	For credit (elective) 5 mtgs/wk 50 mins/mtg	Team
	1	10-12	2	After school (HSTA) 1mtg/wk 60 mins/mtg	Team	After school (HSTA) 1mtg/wk 60 mins/mtg	Team
Randolph Technical Center	1	9-12	22	For credit (business curriculum) 5 mtgs/wk 90 mins/wk	Team		
		9-12	3			For credit (independent study) 5 mtgs/wk 90 mins/wk	Individual
Sandy River M.S.	2	8	8	For credit 5 mtgs/wk 82 mins/mtg	Team	For credit 5 mtgs/wk 40 mins/mtg	Team
		8	7	For credit 5 mtgs/wk 40 mins/mtg	Team	For credit 5 mtgs/wk 82 mins/mtg	Team
Spring Valley H.S.	1	10-12	11	For credit 5 mtgs/wk 45 mins/mtg	Team	For credit 5 mtgs/wk 45 mins/mtg	Team
		10-12	19	For credit 5 mtgs/wk 45 mins/mtg	Team	For credit 5 mtgs/wk 45 mins/mtg	Team
		10-12	3	For credit 5 mtgs/wk 45 mins/mtg	Team	For credit 5 mtgs/wk 45 mins/mtg	Team

Perceived Obstacles

According to Caperton (2008), as the Globaloria developers constructed their program, they identified three obstacles which they perceived to be the most daunting to their plans. First, they considered it vital that the students had proper access to the necessary technology. A second concern identified was soliciting business partners and the third was for recruiting and retaining of teachers for the project.

Technology Access

Technology access was identified by the Worldwide Workshop Foundation as one of the obstacles to project implementation. In her report on the first year of the project, Globaloria's founder and president, Idit Caperton (2008) made this observation:

> West Virginia's legendary and long standing commitment to educational and economic improvement, along with its household income statistics, makes it a perfect pilot state. With significantly lower median household income and per capita income than the rest of the country, West Virginia represents both an urgency and an opportunity to close the digital divide. West Virginia, a rural state, is not yet widely wired; most citizens are not yet using high-speed internet at home and therefore cannot develop 21st century skills. They are lagging behind and need help.

Partners in the Project

The second concern identified by the Globaloria: MyGLife developers was the ability to find willing partners and committed educators. In her report of the first year of project implementation, Caperton (2008) listed several groups and companies as supporters including the Claude Worthington Benedum Foundation, the Caperton Fund,

Verizon, the West Virginia Department of Education and the Arts, the West Virginia Center for Professional Development, West Virginia University, Marshall University, Edvantia, and the West Virginia Department of Education. While the faculty and students of West Virginia University and Marshall University assisted in researching the project, the Benedum Foundation, the Caperton Fund and the West Virginia Office of the Governor joined with Verizon to provide funding. The intent stated by the WWWF was to raise enough money for the kick-off and then to turn over the program to the West Virginia Department of Education for statewide distribution after a successful pilot launch and two years of successful operation.

Educator Preparation

In order to secure and retain teachers for the Globaloria program Caperton (2008) detailed the steps taken by the Globaloria program developers. The WWWF planned to provide staff development to participating teachers before and during the launch of the program. Their plan called for ten training workshops including three multi-day face-to-face and seven virtual trainings. A focus on collaboration and community building was stressed, with educators acting as informal mentors for one another. The plan also called for the educators to participate in both an educators' blog and a wiki for the exchange of resources and the support of the participants.

The developers intended that the training should include the educators' doing what they would be asking the students to do in terms of learning and applying technology, and practicing their planning and collaboration skills. This model also called upon the teachers to develop many of their skills independently through the course of their training and the subsequent launch of the program with their students. The face-to-

face workshops were described as critical for establishing the online community and relationship between the foundation and the educators. The virtual training sessions provided motivation for the educators while allowing a cost savings to the program. For their participation in the program, lead educators received $3000 and supporting educators received $1000. The stipends were seen as a means for the program to demand performance and commitment from the educators (Caperton, 2008).

In reviewing the first year of the project, the World Wide Workshop Foundation determined that there were obstacles for the educators which needed to be addressed. Sufficient time was not available in the daily schedule to participate in self-led learning. The educators found that they needed more support initially than had been planned. The progress reports developed by the educators did not focus enough on their own learning and teaching. The community of educators in the project did not develop to the extent that the developers had hoped, as the more experienced educators did not connect with and mentor their less confident colleagues. It also became evident that the requirements for completing the program and securing the promised stipend were not clearly understood by all participants and that even the most successful educators needed to improve their methods of integrating content area learning into the program's student projects (Caperton, 2008).

While Globaloria's developers identified certain components and individuals as critical to the success of the program – technology access, partners and instructors – school principals were not targeted for initial involvement with the project. Whether that omission has had any impact on Globaloria's success is unknown, but Caperton (2008)

stated that instructional support from school principals and administrators was linked to successful school implementation of the project.

The outcomes sought in technology projects were "complex and not entirely captured by traditional educational measures," as observed in a monograph published by the Rand Corporation to guide evaluation of such initiatives (Bodilly & Mitchell, 1997). Among their recommendations for appropriate evaluation criteria were changes in student outcomes, both short term and long term, and the adoption of multifaceted approaches to analysis that provide evidence beyond that generated by the project itself. Consistent with that recommendation, the research reported here supplemented the work being done by the Globaloria research staff regarding participating students' acquisition of specific technological skills and contemporary learning abilities (CLAs).

Reynolds and Caperton (2009) defined contemporary learning abilities or CLAs as 21st century skills that students will develop from participation in the Globaloria program. Six CLAs have been identified for the Globaloria participants:

1. invention, progression and completion of an original digital idea (for an educational web-game or interactive simulation;
2. project-based learning through online project management in a wiki-based networked environment;
3. publishing and distribution of self-created digital media artifacts (using wikis, blogs and websites);
4. social-based learning, participation and exchange in a networked environment (cross-age and class-expertise);
5. information-based learning, purposeful search, exploration; and

6. surfing websites and experimenting with web applications and tools.

Reynolds and Caperton (2009) stated that these CLAs were more focused upon problem-solving in technology environments than were more traditional technology skills. They also hypothesized that these CLAs were thought to be transferable to work and learning contexts which participants will encounter in the future.

Projections from the World Wide Workshop Foundation indicated that the program was to be in 22 West Virginia schools during the 2009-2010 school year, serving over 1000 students. The plan was to eventually implement the program state-wide. Globaloria was also customized and integrated into the daily curriculum of The East Austin College Prep Academy, a new charter school established by Southwest Key in 2009 in Texas (WWWF, 2009).

Need for the Study

This study proposed an investigation of Globaloria from a different perspective and with dual but interrelated foci. The initial focus, consistent with the grounding of the project in constructionism which is itself grounded in constructivist thinking, involved an examination of the effects, if any, of Globaloria on the participating students' academic performance in other curricular or co-curricular contexts (e.g., course grades/GPA, test scores, class rank, attendance and other such data as could be collected through the West Virginia Educational Information System and for which consent was obtained), both prior to participation in Globaloria and after. This analysis permitted a preliminary answer to the question of whether participation in Globaloria improved students' overall academic performance and assisted in the preparation for the second focus of the study – the

perceptions of principals in Globaloria-participating schools toward the Globaloria project.

Collecting the perceptions of principals whose schools were participating in the Globaloria initiative and investigating participating students' outcomes data in other contexts to determine whether the Globaloria Program exerted any influence, positive or negative, upon student performance provided valuable information for principals whose schools are approached to participate in subsequent years in this or a similar program. The World Wide Workshop Foundation intended to continue to expand their distribution into additional schools: "We want to take it statewide, then nationwide, then worldwide" (Darst, 2009). The WWWF further announced that, in order to achieve their objectives, the World Wide Workshop would work with their partners to 1) increase the number of participants each year, reaching 3500 high school students by 2013 by expanding the program and thus reaching additional educators through the professional development component; 2) further develop the Globaloria online platform, curriculum and associated evaluation rubrics to improve mathematics, science, reading , writing and 21st century skills; 3) introduce the Globaloria platform to be implemented in core content curricula in public high schools, including in English/Language Arts, Mathematics, Science, Social Studies and Technical and Career Tracks (I. Caperton, personal communication).

The epistemological elements of Globaloria presented a unique opportunity for investigating the efficacy of constructivism in a new environment: the technology laboratory. If it could be demonstrated that students participating in Globaloria have acquired skills that have led to improved performance in other academic outcomes, the use of emerging technologies to facilitate constructivist learning would have acquired

some much needed evidence. With these two components serving as the foundation for the investigation, the following broad questions were addressed in order to prepare as thorough an understanding as possible of the academic impact of Globaloria in order to guide principals who will be making decisions regarding the implementation of MyGLife or similar programs in their own schools.

Research Questions

The Globaloria: MyGLife program was designed to allow students to develop skills in game development and global awareness in the context of a problem-based learning project (Reynolds & Caperton, 2009). Theorists Jean Piaget, John Dewey and Lev Vygotsky saw learning as a product of active participation and creation, not by simply listening or observing. Vygotsky and Dewey specifically cited the social interaction of learners as being central to the acquisition of skills and knowledge. Vygotsky, however, added the element of culture (i.e., how it shapes thinking and provides the "tools of intellectual adaptation" with which learners can seek out new information or knowledge) to the concept of interaction, and it was because of this combination of cultural tools with the social aspect of learning that this study made use of the work of Vygotsky (1978) as its primary theoretical lens. By examining the MyGLife project through the lens of the Vygotsky's activity theory, this study focused on whether the skills acquired in the project may be transferred to other contexts and content areas.

1. Do the skills acquired by students in the Globaloria program enhance outcomes in other academic contexts?
2. What do principals perceive to be the purpose(s) of Globaloria?
3. What do principals perceive to be their role(s), if any, in Globaloria?

4. What do principals perceive to be the benefit(s), if any, of having the program in their schools?
5. What do principals perceive to be the liability(ies), if any, of having the program in their schools?

Research question 1 was addressed through an examination of extant academic records for which consent had been obtained by the Globaloria: MyGLife staff. Research questions 2 through 5 were addressed through surveys and follow-up qualitative interviews with principals of the participating schools.

The Globaloria: MyGLife program was designed to allow students to develop skills in game development and global awareness in the context of a problem-based learning project (Reynolds & Caperton, 2009). As discussed in full in Chapter Two, this design was consistent with the perspectives of Piaget (1958, 1970, 1980), Vygotsky (1962, 1978, 1981, 1982, 2004, 2007 and Dewey (1916, 1938, 1964), who saw learning as a product of active participation and creation, not by simply listening or observing. Vygotsky and Dewey specifically cited the social interaction of learners as being central to the acquisition of skills and knowledge. It was because of this reliance upon the social aspect of learning that the study made use of the work of Vygotsky and Dewey as the primary theoretical lenses for this study. By examining the Globaloria project through the lens of the constructivist theories of Vygotsky and Dewey, this study attempted to determine whether the skills acquired in the project may be transferred to other contexts and content areas.

Operational Definitions of the Variables

Outcomes in other academic contexts referred to student academic grades and achievement test results as well as behavior interventions and attendance data. Research question 1 was addressed through an examination of extant academic records for which consent had been obtained by the Globaloria: MyGLife staff. Research questions 2 through 5 were addressed through surveys and follow-up qualitative interviews with principals of the participating schools.

Purpose(s) of Globaloria referred to the program developers' (i.e., the World Wide Workshop Foundation) goals or objectives for students in the Globaloria program.

Principals role(s) in Globaloria referred to the duties and responsibilities expected of the participating schools' principal by the Globaloria program.

Benefit(s) of having the program in their schools referred to principals' perceived positive outcomes experienced by the schools participating in the Globaloria program.

Liability (ies) of having the program in their schools referred to principals' perceived negative outcomes experienced by the schools participating in the Globaloria program.

Methods

Educational researchers rely upon two major primary research methods to conduct their work. Quantitative methods encompass the collections of numeric data and are used to explain, predict and to sometimes control phenomena which interest the researcher. Rather than relying upon numeric data, qualitative research focuses upon comprehensive narrative and visual data in order to gain insights into a particular phenomenon.

Educational research can use either of these research methods individually, or can combine elements of both into a mixed-methods study (Gay, Mills, & Airasian, 2006).

In order to more fully assess the effects of the Globaloria project's implementation on the pilot schools, it was determined that a mixed-methods study should be conducted. While this study used quantitative methods to analyze student academic data as it related to the effects of the project, if any, upon student outcomes, this approach did not lend itself well to understanding the perceptions of school principals who were charged with discerning the effects and benefits of the project upon their schools. It was therefore necessary to use qualitative methods, in the form of document analysis, survey, and interviews to examine the research questions relating to the perceptions of the principals.

Limitations

As is commonly the case with mixed-method studies, limitations tended to be more numerous than with studies incorporating only a single method. In this study, there were limitations to both the quantitative and qualitative components. The quantitative limitations applied at the school, administrator and student levels.

First, while the 11 schools examined in this study represented the total population of Globaloria: MyGLife in West Virginia, there were nonetheless only 11 schools and all were obviously in the same state. Consequently, the study's findings may not be generalized to the implementation of the program in other states or in schools with different demographics.

Second, the use of a researcher-developed survey for principals, responses to which were acquired through a self-reported questionnaire, constituted a limitation.

According to Kerlinger and Lee (2000) such instruments are necessarily limited by the accuracy of participants' responses.

Third, any increases in Globaloria students' academic performance outside of Globaloria may have simply been a result of intellectual maturation of the student. Likewise, it is possible that the participating students were engaged in other curricular reforms implemented by the school or district that may also have led to academic improvement.

The remaining limitations of this study were those typically associated with qualitative approaches to research. The findings were limited to understanding the perceptions of specific school principals rather than being generalizable to the larger population of principals in the state. It should be noted that as Globaloria: MyGLife remained in its pilot phase; the participating principals were individuals who were likely identified, at least initially, as receptive to technology initiatives. This may indicate a predisposition that was not generalizable to all principals. In addition, while the researcher's own experience as a school administrator constituted a source of empathy and provided an experiential background to be effective in eliciting and understanding principals' perceptions, it could also be viewed as a limitation in that it was a potential source of bias.

CHAPTER TWO: REVIEW OF THE LITERATURE

As was noted in the previous chapter, this investigation of the Globaloria initiative had two interrelated foci: the effect(s), if any, of Globaloria on the participating students' academic performance in other curricular or co-curricular contexts (e.g., course grades/GPA, test scores, class rank, attendance and other such data as were collected and for which consent was obtained by the Globaloria staff) and the perceptions of principals in Globaloria-participating schools toward the Globaloria project.

In order to explain the foundations and development of the Globaloria program, this review of the literature first situated the initiative in the mission of the Partnership for 21st Century Skills (P21) and the changes made by the West Virginia Department of Education (WVDE) to its goals and policies as a result of its association with P21. The use of technology in school from the viewpoints of both technology integration advocates, who encourage wider and better utilization of technology in schools, and technology skeptics, who urge caution in the overreliance upon that same technology was examined next. That discussion was followed by a brief look at project-based learning, consistent with Globaloria's implementation, and professional development as a general need. The chapter concluded with an examination of the various and complementary theoretical frameworks, including constructivism, constructionism, and activity theory, that are relevant to the analysis of the Globaloria project, with a particular emphasis on the latter.

The Changing Workforce and the Partnership for 21st Century Skills

With the increased emphasis from both the commercial and education sectors on technological skills in the workforce it might have been expected that the achievement

level of students should also increase. While the educational level of the worker had been rising and was predicted to continue to do so in the foreseeable future, the achievement test data for the same individuals showed only an average level of proficiency.

Students in the United States were preparing for jobs which differ from those held by their predecessors. In 1967, production of material goods, such as automobiles and chemicals, and delivery of material services, such as retailing and construction, accounted for approximately 54% of the United States' economy (Karmarkar & Apte, 2007). Those industries had shifted by 1997, by which time information products, such as computers and software, and the provision of information services, such as telecommunications, accounted for 63% of the county's economy. During that 30 year time frame, information services had risen from 36% to 56% of the economy (Karmarkar & Apte, 2007).

In a survey conducted to determine the skills that employers consider vital to 21st century workers with a four year college degree, the top skills were professionalism, 93.8%, teamwork, 94.4%, and oral communication, 95.4% (Casner-Lotto & Barrington, 2006). The same survey ranked skills important to high school graduates as professionalism, 80.3%, teamwork, 74.7%, oral communication, 70.3%, ethics and social responsibility, 63.4% and reading comprehension, 62.5%. The survey had a relatively small response rate of only 4.8% (Casner-Lotto & Barrington, 2006).

The United States Department of Labor Bureau of Labor Statistics (BLS) has tracked the rates of growth of the United States labor force and made predictions based upon their data. The BLS indicated that between 1950 and 1960 the labor force in this country grew by a rate of 1.1%, followed by a growth of 1.7% between 1960 and 1970.

An increased growth rate of 2.6% was recorded between 1970 and 1980, which the BLS attributed to the baby-boom generation joining the labor force. The rate of growth has decreased steadily to a rate of 1.6% from 1980 to 1990 and 1.2% from 1990-2000. Between 2000 and 2015, the rate is predicted to drop further, to 1.0% growth. Finally, the BLS predicts that the rate of growth of the United States labor force will drop to only 0.2% between 2015 and 2025 (U. S. Department of Labor Bureau of Labor Statistics, p. 1).

In the decade from 1998 to 2008, the BLS observed that 10 occupations were predicted to add more than approximately 5 million jobs to the United States labor force. The top occupation from this list was that of systems analyst which was predicted to add a total of 577,000 positions (BLS, p. 9). During that same period of time, the BLS stated that 5 of the 10 fastest growing occupations are computer related. These positions included computer engineers, increasing 108%, computer support specialists increasing 102%, systems analysts, increasing 94%, database administrators, increasing 77%, and desktop publishing specialists, increasing 73% (BLS, p. 8).

In 1983 a report titled “A Nation at Risk” was published by the National Commission on Excellence in Education, whose membership included David Gardner, president of the University of California, Yvonne W. Larsen, past president of the San Diego City School Board, as well as other representatives of public k-12, higher education and business. The work addressed the perceived decline of American supremacy in the world: “Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world…The educational foundations of our society are presently being eroded by a rising

tide of mediocrity that threatens our very future as a Nation and a people" (National Commission on Excellence in Education, 1983). The response of the nation to this report was to push for more businesslike results from our schools, primarily in the form of standardized test results. In order to achieve higher scores and to encourage productivity, an effort began to include more technology in classrooms (Cuban, 2002).

In response to these changes in both the workforce and the workplace, a group of business community members, education leaders and policymakers formed the Partnership for 21st Century Skills (P21) in 2002. Based in Tucson, Arizona, this advocacy group stated that their intention was to transform education to meet the changing demands of the workplace. Several companies have placed members on the P21 Board of Directors including Adobe Systems, American Association of School Librarians, Apple, ASCD, Atomic Learning, Blackboard Inc., Cable in the Classroom, Cisco Systems, Corporation for Public Broadcasting, Davis Publications, Dell Inc., Education Networks of America, Education Testing Service, EF Education, Ford Motor Company, Gale Cengage Learning, Hewlett Packard, Intel Foundation, JA Worldwide, K12, KnowledgeWorks Foundation, Learning.com, Learning Point Associates, LEGO Group, Lenovo, McGraw-Hill, Measured Progress, Microsoft Corporation, National Education Association, Oracle Education Foundation, Pearson, PolyVision, Scholastic Education, Sesame Workshop, THINKronize, Verizon and Wireless Generation. Joining the Partnership as strategic partners were the Council of Chief State School Officers (CCSSO) and the International Society for Technology in Education (ISTE) (Partnership for 21st Century Skills, Board Members).

P21 stated that education for students preparing for the 21st century workplace should connect to the students' lives and be based upon current research in learning (P21, Learning for the 21st century, p. 7). The group also stated that the key elements of a quality 21st century education were an emphasis on core subjects, emphasis on learning skills, use of 21st century tools to develop learning skills, teaching and learning in a 21st century context, teaching and learning from 21st century content, and finally using 21st century assessments to measure 21st century skills (P21, Learning for the 21st century, p. 8-14).

Despite this impressive array of collaborators, P21 had not met with universal acceptance in educational circles. A panel discussion was convened in February, 2009 by Common Core, a non-profit group that supports a full core curriculum. The panel was comprised of researchers, historians and policymakers, including E.D. Hirsh, Jr., Diane Ravitch, Daniel Willingham and Ken Kay, founder of P21. Members of the panel expressed concern with the P21 approach to learning and warned that unless states involved with P21 ensure that all their students were also receiving a thorough foundation of content knowledge along with the focus on 21st century skills, the students would be unable to develop the higher-order thinking skills that the P21 group espouses. Some even pointed out that the current emphasis on skills was merely a continuation of a long-standing debate between those who favor academic content and those who prefer skills development as the primary purpose of education (Sawchuk, 2009).

When the state of Massachusetts introduced its initiative to focus upon 21st century skills in November, 2008, a verbal battle commenced between advocates and opponents in commentaries in *The Boston Globe*. Opponents feared that the ratification

of the Partnership's goals would lead to a watering down of the state's assessment system and instructional standards. The plan's advocates claimed that the Partnership's goals would serve to supplement both the standards and the assessment system (Sawchuk, 2009). Diane Ravitch, a research professor at New York University, stated, "There is nothing new in the proposals of the 21st-century skills movement. The same ideas were iterated and reiterated by pedagogues across the 20th century" (Ravitch, 2009).

Daniel T. Willingham, a professor of psychology at the University of Virginia, Charlottesville challenged the idea that analytical and critical thinking skills can be developed without a proper grounding in content. He argued that the teaching of such skills was inseparable from the teaching of core content, as it was in fact the content which allowed students to recognize problems and to recognize which critical thinking skills should be used to solve them (Willingham, 2009). E.D. Hirsh, professor emeritus at the University of Virginia, continued this line of thinking and posited that critical thinking skills would not transfer from their original context to workplace situations unless there was a strong linkage between the content and the developing skills. Hirsh further contended that the premise of the Partnership was that once the analytical and critical thinking skills were acquired, they were easily transferable to other content areas and situations was a fundamental error in reasoning as well as a fatal flaw (Hirsch, 2009). According to Dewey (1964), however, learning was an application of prior knowledge and experiences to new situations.

By the time these concerns were raised, the state of West Virginia was already fully involved in its work toward meeting the goals set forth by P21. Following the hiring of Dr. Steven Paine as West Virginia state superintendent of schools on July 1, 2005, the

state moved to formalize its involvement with P21 (West Virginia Department of Education, 2008, p. 1). On November 14, 2005, Governor Joe Manchin and his wife Gayle Manchin officially announced their joint effort with P21 to "ensure every child in West Virginia succeeds as a citizen, worker and leader in the 21st century" (WVDE, 2005).

Dr. Paine put forward four initiatives for the West Virginia public school system to address the goals shared by the WVDE and P21. First, the state would redefine the vision of the school system in that a graduate would have competence in 21st century content, skills and tools. Second, high quality assessments would be developed to test the skills students were to be gaining. Third, support systems would be created and strengthened to assist in the proposed changes. Fourth, barriers to change would be removed (WVDE, 2008, p. 5).

In March, 2006, groups of West Virginia teachers were gathered to redesign the West Virginia content standards and objectives (CSOs). These teachers, who had been identified as masters of their content areas, were trained on not only the 21st Century Initiative, but also the assessment of Depth of Knowledge (DOK) of the objectives. These teachers reviewed national and international assessments and wrote both the CSOs and performance descriptors. These CSOs were reviewed by the P21 group, as well as by Dr. Norman Webb of the University of Wisconsin, who specifically examined the DOK of each objective. Dr. Webb then made recommendations to increase the rigor of different objectives to improve the CSOs for each grade level. Finally, a third review was conducted by Dr. William Schmidt of the University of Michigan. Dr. Schmidt reviewed the CSOs to determine their alignment with the TIMSS frameworks. The final version of

the CSOs was approved by the West Virginia state board of education on July 1, 2008 (WVDE, 2008, p. 29).

Instructional guides were subsequently generated to promote changes in the instructional process. Using the "Framework" document as a guide, approximately 120 K-12 educators gathered to create lessons which they judged to be both high quality and user friendly. These lessons were to be focused on the use of formative assessment to monitor learning, and the process yielded at least four instructional guides per grade level, which were made available on the Teach 21 Web site in November, 2007 (P21, 2008, p. 31-32).

Standards were also reevaluated for learning skills and technology tools. In March, 2006, another group of West Virginia teachers were gathered and trained in the 21st Century Initiative and DOK of instructional objectives. This group was chosen based upon their expertise in technology, curriculum and instruction at specific grade levels in elementary, middle and high school levels. Based upon the national standards of ISTE and P21, state policy 2520.14 was organized around three standards and associated grade-level objectives. The standards were organized around the standards of information and communication skills, thinking and reasoning skills and personal and workplace skills. The standards were supported by programmatic objectives for grades PreK-2, grades 3-4, grades 5-8 and grades 9-12 (WVDE, 2008, p. 30).

The WVDE determined that technology integration specialists (TISs) were needed to assist in the integration of the needed 21st century skills and content. So a professional development program geared to train and certify TISs was developed. The program encompassed forty hours of professional development and certified the

specialists to work with classroom teachers in designing new classroom teaching methods and instructional processes (P21, 21st century skills in West Virginia, p. 2).

Recognizing that the change process would require leaders knowledgeable of the technology integration process as well, the WVDE also created the West Virginia Institute for 21st Century Leadership. Participants in this program were provided with twelve intensive days of professional development over the course of a year during which they were immersed not only in the "Framework" documents, but also in training for the change process and change leadership. Following a year of training in both face-to-face and online professional development, the participants were to present their work, in the form of electronic portfolios, to their superintendents as part of the yearly evaluation process.

Teachers were also included in the training efforts in the form of the West Virginia Teacher Leadership Institute (TLI). Teachers gathered for staff development in 21st century skills and problem based learning (PBL) for one week in the summer with follow up sessions to be delivered by webinar at various times throughout the school year. It was intended that these teacher leaders should return home and train others in their schools and counties.

Professional development was also targeted toward members of the WVDE staff as well as members of the local Regional Education Service Agencies (RESAs) serving West Virginia. This professional development lasted for nine days over a three-month period and provided training on the perceived urgency for change and the six components of 21st century learning (P21, 21st century skills in West Virginia, p. 2).

In terms of what high schools needed to have been doing to address the needs of 21st century learners, P21 outlined three fundamental ideas which they did not believe to have been fully considered in our schools. First, there were results that matter to graduates which go beyond the traditionally accepted measures of grade point average, achievement test scores, class rank, etc. These results related to readiness for success in the workplaces of the 21st century. Second, the nation needed to redefine rigor as it applied to high school to include not only the traditionally accepted curriculum, but also mastery of 21st century skills and content. Finally, high schools should be redesigned to utilize 21st century skills fully integrated with core academic subjects in order to more thoroughly prepare students for the challenges they will face in the workplace (P21, Results that matter, p. 2). These three fundamental ideas rested upon a single foundational claim that has been repeated for so long that it's an article of faith: graduates of America's schools no longer hold an edge in the global market.

Educational gains in other countries, it was argued, have begun to equal or at least challenge the successes previously attributed to the United States educational system on such indicators as the TIMSS study and the PISA testing. Advantages in creativity and innovation were no longer the sole province of the United States (P21, 2006).

Moreover, the nature of the workplace, the workforce, skills and available jobs was changing. Advancements in training and education in other countries in the international community have seen the advantages of our workers depreciated in the global marketplace (P21, 2006). As a Rand Corporation report observed, "The skills of the workforce will increasingly be the defining characteristic that determines the extent to

which an economy can develop and exploit new technologies and compete in the global marketplace" (Karoly & Panis, 2004).

These events served to foster a climate of change in West Virginia's public schools. The increased emphasis on 21st century workplace readiness and a renewed emphasis on technology usage caused schools to begin reexamining existing programs and looking for programs which would address both workplace skill development and technology. When the Globaloria program was recommended to pilot schools by the West Virginia Department of Education, participation may have been viewed as mandatory.

Computers in Classrooms

In 1996-1997, it was estimated that 65% of school districts in the United States would find it necessary to increase the amount budgeted for school technology (Association of Computer Machinery, 1996). This spending was anticipated to reach $4.1 billion that year, with $92.70 being spent per student. This figure was predicted to increase to $9.5 billion total in 2005-2006 (Angelo, 2002).

In the New York City public schools, approximately $300 million was spent on instructional technology in the 2004-05 school year (Gehring, 2005). That same year, the Los Angeles school system allocated $4.5 million, as well as $5.5 million the district won through competitive federal grants in 2004 to improve the teaching of science and mathematics using technology. Rather than providing technology for students, it was noted that the equipment purchased was used primarily for analyzing student achievement data and then aiding in the adjustment of teaching to respond to the analysis.

Cuban (2002) described educational technology as woefully underutilized and primarily used to supplement traditional classroom instruction. He asked three questions:

1. In schools where computers are readily available, how do teachers and students use the machines in classrooms for instruction?
2. Have teaching and learning changed as a consequence of two decades of heavy promotion and investment in computers and other technologies? If so, what explains the changes? If not, what explains the stability?
3. Has the investment in computers and other technologies been worth the cost? (p. 19)

Bringing the hardware and wiring into the school, once perceived to be the greatest obstacles to technology integration in education, has indeed taken place. However, it was becoming increasingly evident that the main obstacle to this movement had been the failure of teachers to know how to incorporate technology into their classrooms and teaching (Punya & Koehler, 2006). Though work to address this skills deficit had taken place, some felt there was still a need to develop a framework that unified the theoretical and conceptual ideas that would work across most classroom settings.

> [An] atheoretical perspective…not only constrains our current educational uses of computers, but also seriously limits our vision of what might be accomplished with computer technology in a broader social, cultural, or educational context. Until we examine the impact of computer technology… from a theoretical perspective, we will continue, myopically and unsystematically, to define the isolated pieces of the puzzle in our separate classrooms and discrete research

> studies. Until we share some theoretical vision of this topic, we will never glimpse the larger picture that could give our everyday classroom efforts direction and meaning (Selfe, 1990.)

L.S. Vygotsky (as cited by Moll, 2004) stated that transfer of school based knowledge should be sought inside both the minds of the learner and the environment in which he learned. Learning therefore was a function of prior learning and the situation in which that knowledge was called into use.

Technology, in the form of computers and the internet, had become a common tool in schools. It was estimated that 87% of students aged 12 to 17 now used the internet, a figure which showed growth from 73% in the year 2000. NewBay Media stated that 55% of teens reported they regularly used the internet for social networking and 81% play online games, a 52% increase since 2000. Estimates indicated that approximately 328,000 students in grades K-12 were enrolled in online distance education classes during the 2001-2002 school year (United States Department of Education, n.d.).

Over half of the nation's school districts had reviewed and reconstructed their curricula in an attempt to address the requirement of higher standards in mathematics, science and technology skills. Despite these efforts, the Partnership for 21 Century Skills reported poll results indicating that 42% of people surveyed believed that other countries were doing a better job of preparing students for future jobs, while only 13% thought that the United States was doing better than other countries in preparation efforts (Miners, 2007).

At a time when it was reported that spending for instructional technology in schools had increased over 300% in the preceding three decades, there was still contention as to whether technology use actually improved the learning process for students or hindered it. While most students were familiar with multiple forms of online communication, the requirements of the workplace called for more refined skills than instant messaging, chat rooms and blogs. Basic computer skills now included the ability to find, decode, evaluate and organize information so that it could be readily used (NewBay Media). More often than not, teachers were accused of using outdated techniques and tools in their classrooms, which held little relevance for students' experiences and lives outside of school (Clark, 2005).

A survey found that though parents considered digital media skills to be important to the future of students, they nevertheless doubted that digital media could add to skills in the areas of communications, collaboration and civic responsibility. Three in four parents surveyed agreed that the proper use of digital media was at least as beneficial to students' future success as were skills in traditional areas such as reading and math. When asked if these digital skills were critical to success in the 21st century, 83% responded that they were. When asked if the web assisted in communication for students, however, 67% of parents surveyed replied that it did not. Similarly, 87% responded that the web did not assist students in learning to work collaboratively, while 75% of the principals reported that they did not believe that the web helped students to become more responsible in their communities (eSchoolNews, 2008).

"Unless you change how you teach and how kids work, new technology is not really going to make a difference," stated Bob Pearlman, a former teacher now with the New Technology Foundation, a nonprofit group (Lohr, 2008).

Not everyone was ready to join the rush to declare computers and their associated technology the means for bringing students to higher academic outcomes. According to Postman (1992), technology was actually brought about by a need to relieve anxiety which is in turn brought about by the technology itself. In other words, we were being inundated by innovations to make the preceding innovations more readily user-friendly. He warned that those who viewed technology only in terms of its new and improved uses were blinded to the negative influences that it may hold. He called these people technophiles. In comparison to these pro-technology technophiles, one may also have identified the technophobes as those who viewed technology with a more pragmatic eye and questioned the more undesirable outcomes of relying upon it.

One need only examine the effect of other technological advancements in education to see some plausible reasons for their hesitation. In 1922, noted inventor Thomas Edison (cited by Oppenheimer, 2003) predicted that the motion picture would supplant the use of textbooks in classrooms. Edison also stated that textbooks were only approximately two percent efficient as they were written at that time. The trend that he coined a "visual education" did not emerge as he had predicted.

In 1945, the introduction of the portable radio receiver led to William Levenson, (cited by Oppenheimer, 2003) the director of Cleveland, Ohio public schools radio station, to announce that "the time may come when a portable radio receiver will be as common in the classroom as is the blackboard. Radio instruction will be integrated into

school life as an accepted educational medium." In the late 1950s and 1960s, psychologist B.F. Skinner (cited by Oppenheimer, 2003) was so taken with the possibilities of the medium that he stated "with the help of teaching machines and programmed instruction, students could learn twice as much in the same time and with the same effort as in a standard classroom."

Armstrong and Casement (2000) expressed worry that most of the emphasis on technology integration in schools was actually more a matter of trying to keep pace of technological change, with academic benefits being relegated to a level that was of secondary importance. While the argument was made that students learn more and at a higher pace with technology and that computer literacy would prepare the students for lives that were more and more influenced by computers, the technophobes worried that the emphasis was more upon getting the latest and greatest computer systems installed and not upon how they were actually being used in the classroom settings.

Technology Standards for Administrators

The role of the school principal had also expanded as a result of the influx of technology into schools. In 2002, the International Society for Technology in Education (ISTE) published technology standards for school administrators. These standards revolved around six primary categories: leadership and vision, learning and teaching, productivity and professional practice, support, management and operations, assessment and evaluation and social, legal and ethical issues (Young, 2002).

The standards detailed specific strategies administrators should use in order to encourage the appropriate use of technology. In terms of leadership and vision, for example, the standards stated that administrators should inspire a shared vision for the

integration of technology and create and maintain an organizational culture in which that vision can be realized. Leaders were encouraged to bring all stakeholders together in understanding and working toward this goal, oversee the development and continued improvement of a long-term technology plan, and use data to drive important changes and decisions (Young, 2002). In light of these standards, it was recommended that school administrators take an active role in the selection, implementation and monitoring of technology programs in their schools.

West Virginia's state policies for education referred to the use of technology in schools and the role to be played by the principal. WVDE policy 5500.03 stated that principals must ensure a safe, efficient and effective learning environment by effectively using technology to find, retrieve and analyze the appropriate data to guide both long-range planning and daily practice. The same policy also stated that technology must be efficiently used to promote student learning and staff professional growth (West Virginia Board of Education, 1997).

As West Virginia began to align its efforts toward the goals it shared with the Partnership for 21st Century Skills, a component focused on the school principal was included in the proposed Framework for 21st Century Schools School Effectiveness. In that document, a principal was envisioned who was knowledgeable about utilizing technology to support learning and who modeled 21st century technology skills in daily practice throughout the school (WVDE, West Virginia's framework for 21st century schools school effectiveness, p. 1-2).

Problem-Based Learning

Problem based learning (PBL) was a constructivist learning strategy which gave students authentic scenarios to solve in collaboration with peers. The PBL strategy encouraged learners to think through problems systematically and in more detail, and to apply the knowledge gained during that thought process in other situations. It provided learners with instructional mechanisms which encouraged higher order thinking skills and allowed students to work effectively with problems which were not only more meaningful to the students, but may also have been unconventional in terms of construction or content (Tseng, Chiang, & Hsu, 2008).

PBL emphasized the social interactions which provided for learning from not only the instructor, but from peers. By utilizing a common computer platform for group interaction, for example, it was possible for individuals to collaborate with one another at different times and from different locations. PBL was also credited with enhancing key learning skills that could be applied not only in the area of the subject being studied, but in other pursuits as well (Tseng, Chiang, & Hsu, 2008).

Tseng, Chiang and Hsu (2008) recommended that students work in collaborative teams of between six and ten individuals. These learning teams must reflect upon their understanding of the issue under consideration, acquire appropriate new knowledge in order to formulate a solution, and then decide how the new knowledge could be used to solve the original problem. This learning cycle allowed for the development and refinement of transferable workplace skills such as problem solving, team dynamics and communication. In the process of transferring knowledge from the individual to the

group, the information passed through three intermediate forms: external knowledge, shared knowledge and common ground.

Barriers to Technology Integration

Hew and Brush (2007) identified the six primary barriers to full integration of technology into K-12 schools as resources, institutional resistance to change, subject culture biases, attitudes and beliefs, knowledge and skills and assessment.

The barrier of resources was defined as a lack in one or more of the following areas: technology, access to technology, time for use, and access to appropriate technical support. The lack of sufficient numbers of computers, limited access to the available computers or the fiscal inability to have broken machines repaired can severely limit student access to the appropriate equipment.

The knowledge and skills barrier referred to a lack of specific technology knowledge and skill, technology-supported pedagogical knowledge and skill, and classroom management skills related to the use of technology. Instructors who were not comfortable with their own skills would likely prove hesitant to ask their students to use those same skills. Professional development of educators' technology skills was therefore viewed as vital to implementation of the use of new technology in schools. Likewise, the attitudes and beliefs of educators were perceived as barriers as well. If educators valued technology, it was more likely to be used in the school. If it was not valued, then the opposite was true.

Institutional resistance referred to deficits in leadership, school scheduling and planning. Fox and Henri (2005) found that a majority of Hong Kong teachers surveyed did not feel that their administrators understood either technology or its vital role in their

plans to improve student skills. Without the support of the administration of a school, scheduling and planning concerns would not be adequately addressed to allow for the successful integration of technology.

Assessment was considered to be a barrier in that the reliance on high-stakes testing could limit the amount of time available to teachers to explore new instructional opportunities. The associated emphasis upon basic skills and information provided an incentive for instructors to stick to more familiar and proven methods of instruction. There was also a shifting of perspective regarding technology from its use as an instructional tool to its use as a testing facilitator, according to Schneiderman (2004). Computers were increasingly viewed as a means to analyze and store testing data rather than as an instructional vehicle to learning.

Strategies to successfully overcome those barriers included developing a shared vision and a technology integration plan, providing scarce resources, changing attitudes and beliefs, offering directed staff development and redesigning assessments. Hew and Brush (2007) suggested that these strategies could be used in conjunction with one another to alleviate the barriers to technology integration.

In the words of Michael Levine, executive director of the Joan Ganz Cooney Center,

> The media landscape has been fundamentally transformed in the past decade. Our kids are adapting to change at breakneck speed. Adults who nurture children are trying to catch up to ensure that the new, ubiquitous digital diet is balanced and educational. The scarcity of [high-] quality research on how these new tools can be used best is an urgent national priority, especially in meeting the needs of

children who are traditionally underserved. Everyone must be prepared to compete and cooperate in our global economy today, so skills like learning to read and think critically, solving problems, and collaborating with children from other cultures are now more critical than ever (eSchoolNews, 2008).

It is hoped that this study can contribute to the scarcity issue identified by Levine. Without understanding how new technology can be integrated into the educational process, it was unlikely that the implementation would succeed in producing positive outcomes for students.

Relevant Theoretical Lenses

As was noted in the introduction to this chapter, there were several various and complementary epistemological theories that could have provided suitable lenses through which to view the Globaloria project and provide some structure to this investigation. Among them were constructionism, constructivism, project-based learning (PBL), and activity theory. Each was examined briefly in this section, with the theory selected for use receiving a more thorough explication.

Constructionism

Constructionism was the framework chosen by the Globaloria research staff for their own research into the effects of the program. Kafai and Resnick (1996) described constructionism as a theory of learning which posited that learners were more likely to construct new understanding and knowledge if they were actively engaged in the creation of an external artifact, such as the computer games constructed by students in the Globaloria program.

Constructionism was developed by Seymour Papert in the 1980s as a means to address the specific learning strategies which were the most conducive for students to properly utilize technology and media. The theory of constructionism had some similarities to Jean Piaget's understanding of constructivism, as both theories viewed knowledge as something to be created through experience, and not simply transmitted from teacher to learner. The theories were dissimilar, however, in that while constructivism stressed the internal cognitive processes associated with learning and the specific developmental stages at which they occur, constructionism focused more upon the production of actual artifacts such as computer programs (Kafai & Resnick, 1996, Fosnot, 2005).

Papert studied with Jean Piaget in Switzerland in the 1950s and 1960s, modifying his constructivist theory to encompass the study of learning with technology. The focus on product (artifact) rather than prerequisite developmental stages denoted the primary difference between the two theories. Papert offered this explanation:

> Constructionism — the "n" word as opposed to the "v" word — shares constructivism's view of learning as 'building knowledge structures' through progressive internalization of actions … It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe (1991, p.1).

Papert's constructionist theory was also complementary to John Dewey's (1916) constructivist philosophy that one must harness a student's existing knowledge in order for that student to be able to acquire new concepts. Constructionists added to the concept

of applying existing knowledge the belief that the creation of an artifact allowed the student to develop a deeper understanding of the particular concept on which he was working.

Constructivism

Constructivism – Papert's "v" word (2002, p. 1) – referred to a process of learning in which the learner applied prior experience(s) and knowledge to new events to develop new understandings. Constructivists cast the student in the role of active participant rather than passive recipient, believing that it was the learner who created knowledge. The learner accessed his current understanding to imbue new situations with meaning (Lambert, Walker, Zimmerman, Cooper, Lambert, Gardner & Szabo, 2002).

As a philosophy of learning, constructivism can be traced to the 18th-century work of Italian philosopher Giambattista Vico, who believed that humans can understand only what they have themselves constructed. A number of others worked with his ideas, but among the first to articulate the implications of constructivism as it applied to child development and to classroom learning were Jean Piaget, John Dewey, and Lev Vygotsky. It was far beyond the scope of this study to offer an extensive account of these theorists' work, but a brief explication of the relevance of their thinking to the investigation follows.

Jean Piaget. Piaget's commitment to children and their education led to his appointment as the Director of UNESCO's International Bureau of Education, a position from which he declared in 1934 that "only education is capable of saving our societies from collapse, whether violent or gradual" (in Munari, 1994, p. 3). He was referred to by many as the pioneer of the constructivist theory of knowing (e.g., Beck & Kosnik, 2006;

Brief, 1986; Duckworth, 2006; Lambert et al., 1995; von Glasersfeld, 1990), a title he sometimes shared with his contemporary John Dewey.

Piaget's constructivism grew out of his interest in the psychological development of children. For him, children's development must necessarily precede their learning and the developmental stages he identified (i.e., sensorimotor, pre-operational, concrete operational and formal operations) he viewed as part of a cycle. Once the child had mastered the new knowledge and cognitive processes of each stage, he moved fairly quickly to the next, pushed by a need to understand or to do something his present skills would not allow. This need generated a state of disequilibrium that required the child to adapt his knowledge and cognitive processes to the new challenges.

While Piaget (1978) felt strongly that children must form their own understandings by being active participants in their learning, the process of knowledge acquisition was secondary to the existence of the necessary developmental stage – that is, development precedes knowledge. A child simply cannot acquire a concept that was beyond his developmental level. For the most part, Piaget also favored self-initiated discovery over social learning.

John Dewey. Dewey, acting from his maxim that "[a]nyone who has begun to think places some portion of the world in jeopardy" (Society of Rogerian Scholars, n. d.), was a relentless reformer of public education arguing that it was too prescriptive, too tied to tradition, and too unconcerned with understanding how children really learn. It was his position that education should be an exchange – a dialogue between and among students and teachers rather than a one-way transmission that renders students impassive recipients.

Thus, education depended on action for Dewey as well, but for him learning occurred through students' creating communities of learners who built their knowledge together by contributing what they knew, acquiring new information from others, weighing the new information against prior knowledge, and making a determination to either accept or reject it depending upon whether it reinforced their prior knowledge or contradicted it. The latter could be accepted/assimilated if the evidence offered for the contradiction was judged sufficiently persuasive to resolve it.

Dewey's thinking was grounded largely in his scientific observations regarding the basic drives of organisms. Given that organisms sought states of equilibrium, he postulated that individuals too seek to make fundamental adjustments to their environments which will engender the same kind of balance – particularly cognitive balance. In this sense, his thinking ran parallel with that of Piaget on the issue of disequilibrium. Dewey described how the "checking" or blocking of an action (i.e., understanding a new concept or acquiring a new skill) created cognitive imbalance, leading the learner to attempt to resolve it. Prawat (2001) provided an illustration:

> [A]n individual who was walking through the woods might find his or her way blocked by a rushing stream. Attention quickly turns to the key question of how to continue the A to B movement through the woods, the 'general principle of action,' in the face of the new contingencies that now confront the individual. Various ideas come to mind: jumping over the stream, perhaps, which may be rejected, or using a log to span the stream, which seems more reasonable. In Dewey's parlance, the principle of action combines with the facts (e.g., the presence of projectable logs) to decide the current course of action. The key

notion here, however, is that arrested action is the occasion for discrimination and thought. (Prawat, 2001, p. 675)

It was the need to cross the stream – the encounter with a new problem – that generates the disequilibrium that led to the subsequent action. The inadequacies of previous knowledge or skills to resolve the current circumstance required that the individual act in a different, and novel, way. If, through an internal dialogue, he could create a suitable course of action, he would have acquired a new skill. If his internal dialogue produced no viable action and if he was alone on his walk, he would have to turn back until he could devise an appropriate strategy for crossing the stream by sharing the problems with others. In either case, a conversation must have occurred in order for cognitive balance to be restored.

Garrison (1995) viewed this need-frustration-action cycle in Dewey's early work as a basic version of a more sophisticated inquiry model that emerged in his later writing. Inquiry of any sort required the use of existing technology to solve new problems, and for Dewey the chief technology was language.

Lev Vygotsky. A number of theories or hypotheses for rethinking cognitive development and psychology surfaced in the 1920s and 1930s from the Moscow Institute on Psychology and Moscow University, most of which were consistent with the work produced by Piaget and Dewey. Russian philosophers and researchers also focused on the premise that the human mind can be understood only within the context of interactions between people and between people and their material environments. Vygotsky's activity theory was representative of that work and was especially useful for the analysis of

phenomena, such as Globaloria, that involved individuals interacting not only with each other but with the tools of their material environments.

Essentially, activity theory (formally Cultural Historical Activity Theory or CHAT) posited that activities undertaken by individuals with problems to solve or purposes to achieve would be conducted through collaboration with others and/or mediated through the use of the available tools of the culture which they have learned to use. Culture, for Vygotsky, made two sorts of contributions to individuals' intellectual development. First, individuals acquired much of their thinking, information or knowledge from the culture. Second, they acquired the processes or means of their thinking (i.e., the "tools of intellectual adaptation") from the surrounding culture. Culture, therefore, was a source of what to think or think about as well as the source for the various methods and tools for thinking and problem-solving. Simply stated, Vygotsky's perspective was that children are only as cognitively developed as the culture they inhabit allows them to be. For him, culture outweighed both the developmental stages proposed by Piaget and Dewey's emphasis on language.

In addition to his emphasis on the culture's "tools of intellectual adaptation," Vygotsky had a companion construct: the "zone of proximal development." This zone was defined as the distance between what a learner could achieve on his own and what he could achieve with the guidance of more capable others, peers or adults. The process was sometimes referred to in Western research as "scaffolding" (Wood, Bruner & Ross, 1976), the support provided by more competent others to learners who were able to benefit from the interaction to expand their understandings.

The distinctions between and among Piaget, Dewey and Vygotsky were, for the most part, more subtle than sharp. For example, all three believed that children were naturally curious and were actively involved in their own learning. Vygotsky, however, believed they relied more on their interactions with others than on self-discovery, as Piaget thought. Vygotsky also agreed with the emphasis on language that inhered in Dewey's work, but he felt its purpose was more instrumental than developmental (i.e., that children used it to interact with others who might be able to assist them with problem-solving). Still, all three theorists were considered critical to the development of constructivism.

Vygotsky's work was chosen as the theoretical framework for this study for two reasons: his emphasis on how culture influenced cognitive development and his emphasis on the importance of social interaction in cognitive development. The combination of constructionist (the use of "tools of intellectual adaptation" to create meaning) and constructivist elements (teams of students working collaboratively with "scaffolding" provided by the teacher) in the Globaloria project, however, made Vygotsky's activity theory the most suitable choice. Activity theory's central premise that learning activities were best undertaken through collaboration with others and/or mediated through the use of the available tools of the culture was perfectly aligned with Globaloria's purpose.

CHAPTER THREE: METHODS

In the atmosphere of scrutiny focused upon schools under the No Child Left Behind Act, which is likely to remain in effect in some form, it is more vital than ever that school administrators carefully weigh all programs offered within their schools in terms of the academic benefits to be gained by students. The perceptions of administrators of the pilot schools for this program were elicited in order to establish the familiarity of the administrators with the goals and effects of the Globaloria: MyGLife program, as well as their impressions of the benefits and/or negative outcomes of the program for students.

The Globaloria: MyGLife program was designed to allow students to develop skills in game development and global awareness in the context of a problem-based learning project (Reynolds & Caperton, 2009). As mentioned in Chapter Two, Piaget, Dewey and Vygotsky saw learning as a product of active participation and creation, not from the student's simply listening or observing. Vygotsky and Dewey specifically cited the social interaction of learners as being central to the acquisition of skills and knowledge. Vygotsky, however, added the element of culture (i.e., how it shapes thinking and provides the "tools of intellectual adaptation" with which learners can seek out new information or knowledge) to the concept of interaction, and it was because of this combination of cultural tools with the social aspect of learning that this study made use of the work of Vygotsky (1978) as its primary theoretical lens. By examining the MyGLife project through the lens of the Vygotsky's activity theory, this study attempted to determine whether the skills acquired in the project may be transferred to other contexts and content areas.

Methods

Educational researchers have relied upon two major primary research methods to conduct their work. Quantitative methods encompassed the collections of numeric data and were used to explain, predict and to sometimes control phenomena which interested the researcher. Rather than relying upon numeric data, qualitative research focused upon comprehensive narrative and visual data in order to gain insights into a particular phenomenon. Educational research can use either of these research methods individually, or can combine elements of both into a mixed-methods study (Gay, Mills, & Airasian, 2006).

In order to more fully assess the effects of the Globaloria project's implementation on the pilot schools, it was determined that a mixed-methods study would be conducted. While this research used quantitative methods to analyze student academic data as it relates to the effects of the project, if any, upon student outcomes, this approach did not lend itself well to understanding the perceptions of school administrators who were charged with discerning the effects and benefits of the project upon their schools. It was therefore necessary to use qualitative methods, in the form of document analysis, survey, and interviews, to examine the research questions relating to the perceptions of the principals.

In considering the research design for this study, the Globaloria Program, Globaloria and its pilot implementation sites in West Virginia were examined. Of the fourteen sites, three do not fall within the purview of public, K-12 education. These three sites represented a youth treatment facility, a residential facility for youth and a community and technical college. The remaining eleven sites represented public middle

and high schools in both urban and rural settings. As one of the primary research questions in this study related to the perceptions of public secondary school administrators, the scope of the study was limited to include only those sites which were supervised by a traditional public secondary school administrator and to exclude those sites which were not.

The study used the case study method to examine various pilot sites. Using within-case and cross-case analysis tools allowed for the examination of the perceptions of the school administrators individually and as a group.

According to Yin (2003), researchers can collect evidence for case study research using six different tools. These research tools include the analyses of documents, archival records, interviews, direct observation, participant-observation and physical artifacts. Yin also stated that, in addition to paying particular attention to the six evidence tools separately, the researcher must adhere to certain overall principles of operation during a case study. Findings, for example, must be supported by two or more sources of evidence. The researcher must maintain a database of the case study information in which individual case/school data are maintained separately, these data must also be separate and independent from the final case study document, and, finally, a chain of evidence which links the questions being asked to the data collected and any conclusions which are eventually drawn from them must be established (Yin, 2003).

Invitations to participate in a survey were extended to the public secondary school administrators involved in the 2008-2009 implementation of Globaloria: MyGLife in West Virginia. This survey (Appendix A) was researcher-developed, reviewed by faculty members at Marshall University's Graduate College of Education and Professional

Development, and responses were requested within a two-week time frame. The surveys included both Likert scale-type and open-ended questions.

The Likert scale-type questions were processed quantitatively, by analyzing descriptive data and searching for potential correlations between responses. The open-ended questions allowed for the discovery of emerging categories within the responses. These emerging categories were used to create individual interview questions for the administrators whose schools were selected for the case study. Bogdan and Biklen (2007) stated that in qualitative research, interviews may serve as either the primary tool for data collection or in conjunction with other techniques such as document analysis and participant observation. In this study, they were used in conjunction with the student academic data and survey responses to create a thorough picture of each case study school's implementation and each corresponding principal's perceptions.

Document analyses of the materials distributed to the pilot school administrators and interviews with selected administrators were used to gain a better understanding of the perceptions of the administrators concerning the benefits and/or drawbacks of the Globaloria program in their schools. Documents included public records, personal documents or other physical materials which were pertinent to the research study (Merriam, 1998); thus, in addition to the paper materials distributed to participating principals, website information and other media produced by the World Wide Workshop and the Globaloria program were included to help to build a more complete representation of the information provided to pilot school administrators before and during the implementation of the project in their schools. The public wiki pages of the

case study schools, both students' and teachers' pages were included in the document analyses in order to get as broad a range of perceptual data as was possible.

Student data were examined using paired samples t-tests to determine whether the skills acquired in the Globaloria project had any effect on the academic performance of students in their other curricular or co-curricular activities prior to and subsequent to their participation in the program. Curricular information for which consent had been obtained included grades received by project participants in their core academic courses, their WESTEST scores, and their class rankings. Co-curricular information included participants' attendance and disciplinary referrals, if any. Student names were kept confidential.

Instruments

The study made use of a researcher-designed survey – the *Globaloria Administrative Survey*. The *Globaloria Administrative Survey* utilized both open response and Likert scale questions to ascertain the perceptions of school principals who had piloted the Globaloria: MyGLife program in their schools during the 2008-2009 school year. Questions were focused specifically upon the understanding of the program's goals and objectives as well as upon the outcomes of the program for students. Data from student grades as well as standardized test scores were gathered from both the current and preceding school years.

Qualitative interviews were designed to delve more deeply into the perceptions of individual administrators as to the purpose and effects of the Globaloria: MyGLife project on students. Interview questions were developed following an analysis of the

results of the *Globaloria Administrative Survey*, document analyses, and student academic records.

Population and Sample

A population of 11 public secondary schools piloted the Globaloria program in West Virginia during the 2008-2009 school year. The sample included all 11 public secondary schools

Data Analysis

Collected data were analyzed using both qualitative and quantitative methods. Responses from the open-ended questions on the *Globaloria Administrative Survey* and interviews were examined using a standard emergent category process. Gay, Mills and Airasian (2006) state that data from interviews may be collected using one of three methods: note taking during the interview, note taking after the interview, or audio or video taping of the interview. In order to ensure accuracy, audio taping was utilized during the interview. The taped interviews were transcribed and the transcripts coded and then analyzed for common statements or themes between and/or among the participants. The perceptions of the school administrators being surveyed and interviewed were examined both individually and as a group.

Bogdan and Biklen (2007) recommended that interviews being tape recorded should be of a finite duration, limiting the length of time for the interview limited the volume of data to be transcribed. For the purposes of this study, the interviews were limited to 30-minute's duration. This time limit allowed the interview participant to fully articulate her/his views of the Globaloria: MyGLife program without generating too many data to be transcribed efficiently.

Student achievement data in the form of grades in the core subjects, overall GPA, WESTEST scores, class rank and related data (i.e., attendance and disciplinary referrals, if any) during both the treatment year and the year immediately preceding it were analyzed using an appropriate analytical method including paired-samples t-tests. Achievement test data and end-of-course grades from both the treatment year and the year immediately preceding it were analyzed for descriptive data and potential correlations using SPSS, a commercial analytical software program.

Validity and Reliability

Gay, Mills and Airasian (2006) defined internal validity of quantitative data as the degree to which differences in the dependent variable were a direct result of manipulation of the independent variable. As this was a non-experimental case study, there was no manipulation of the independent variable, nor was there a control group for comparative purposes. Nonetheless, for the quantitative component of the study, the dependent variable was student performance on a range of academic activities (i.e., a standardized test, the WESTEST; grades in core subjects, overall GPA, class rank, and related academic data such as attendance and disciplinary referrals), while the independent variable was participation in the Globaloria: MyGLife program. The key measures were student performance prior to and subsequent to participation in the program.

Quantitative validity was also commonly understood as the extent to which an instrument accurately measured what it purported to measure. The *Globaloria Administrative Survey* was examined by a panel of experts on survey creation and design from the Leadership Studies department of Marshall University Graduate College of

Education and Professional Development and edited to ensure clarity of items and alignment with the research questions.

Quantitative reliability was typically understood as the degree to which results of the study were generalizable to other groups and/or settings. Since the survey was researcher-generated and had no reliability history, the reliability of the survey was gauged by the extent to which experts felt it was valid. Reliability in a study using researcher-generated instruments was necessarily difficult to achieve. Careful preparation of the survey instrument, however, coupled with experts' scrutiny of the research questions and the survey instrument should have ensured a measure of confidence.

As this study pertained to one specific technology integration project, it might prove problematic to generalize findings to other, non-related groups or settings. It was possible, however, that it could prove relevant in comparison to similar programs that emphasized development of technological artifacts in a collaborative environment.

The validity of qualitative research may also relate to the degree to which the data collected measured what the instrument purported to measure, while qualitative reliability may be defined as the degree to which the instrument, in this case the interview questions, led to the same results when reapplied in the same context at a different time or in a different but similar context.

Patton (1990), however, stated that "[t]he validity and reliability of qualitative data depend to a great extent on the methodological skill, sensitivity, and integrity of the researcher (p. 11)." Patton further stipulated that it was the researcher who was the instrument of data collection in qualitative research (1990).

Merriam (1998), in fact, argued that the entire notion of reliability "in and of itself is problematic. That is, studying people and human behavior is not the same as studying inanimate matter. Human behavior is never static (p. 55)." Furthermore, Merriam asserted, qualitative researchers were not trying to establish precedents where reliability was essential, but that qualitative researchers instead sought to understand the world from the perspectives of those in it, and whether the results of a study were consistent with the data collected (1998). Nevertheless, as was the case with establishing the reliability of the researcher-generated survey, interview questions were reviewed by experts in the field of qualitative interviewing in order to address reliability.

The study, thus, blended administrators' responses to survey and interview questions with an examination of participating students' academic records in order to derive as complete a picture as possible of the impact of the Globaloria: MyGLife program. It was an attempt to address two related issues: 1) the effect(s), if any, of the program on student academic performance and 2) administrators' perceptions of those students' performance data and their relationship, if any, to the program, as well as their general perceptions regarding the value of having this technology program operating in their schools.

Limitations

As is commonly the case with mixed-method studies, limitations tend to be more numerous than with studies incorporating only a single method. In this study, there were limitations to both the quantitative and qualitative components. The quantitative limitations applied at the school, administrator and student levels.

First, while the 11 schools examined in this study represented the total population of Globaloria: MyGLife in West Virginia, there were nonetheless only 11 schools and all were obviously in the same state. Consequently, the study's findings may not be generalized to the implementation of the program in other states or in schools with different demographics.

Second, the use of a researcher-developed survey for administrators, responses to which were acquired through a self-reported questionnaire, constituted a limitation. According to Kerlinger and Lee (2000) such instruments were necessarily limited by the accuracy of participants' responses.

Third, any increases in Globaloria students' academic performance outside of Globaloria may have been simply a result of intellectual maturation of the student. Likewise, it was possible that the participating students were engaged in other curricular reforms implemented by the school or district that may also have led to academic improvement.

Fourth, the reporting structure used by the pilot schools to report their students' academic data to Globaloria was not uniform. Due to the differences in reporting between schools, it was not possible to make comparisons between schools and the analysis performed within each school's data determined no significant differences between the individual students' pre and post program academic grades.

The remaining limitations of this study were those typically associated with qualitative approaches to research. The findings were limited to understanding the perceptions of specific school administrators rather than being generalizable to the larger population of principals in the state. It was also important to note that as Globaloria:

MyGLife remained in its pilot phase; the participating administrators were individuals who were likely identified, at least initially, as receptive to technology initiatives. This may have indicated a predisposition that was not generalizable to all administrators. In addition, while the researcher's own experience as a school administrator constituted a source of empathy and provided an experiential background to be effective in eliciting and understanding principals' perceptions, it might also be viewed as a limitation in that it was a potential source of bias.

CHAPTER FOUR: FINDINGS

This study served as an investigation of a pilot technology program in selected West Virginia schools. Globaloria: MyGLife was designed and directed by the World Wide Workshop Foundation and focused on helping students to develop skills in game development and global awareness in the context of a problem-based learning project (Reynolds & Caperton, 2009). There were two foci in the study: whether participation in Globaloria improved students' overall academic performance and how the principals in Globaloria-participating schools viewed the goals, objectives, benefits and liabilities of the project.

Data were collected through the Globaloria Administrative Survey, a researcher-designed instrument distributed to all principals of West Virginia schools offering the Globaloria program in the 2007-08 and 2008-09 school years; through the extant academic records of participating students for whom consent had been obtained; and through interviews with participating principals. The results of each of the data analyses are recorded in this chapter.

Instrumentation

The Globaloria Administrative Survey utilized both open-response and Likert-style questions to ascertain the perceptions of school principals who had piloted the Globaloria: MyGLife program in their schools during the 2007-08 and 2008-09 school years (Appendix A). Questions were specifically focused upon principals' understanding of the program's goals and objectives as well as the academic outcomes of the program for students. Extant data from student academic records (i.e., grade point average and WESTEST scores) prior to and subsequent to their participation in Globaloria, were

examined for both the current and preceding school years. These data were gathered by the World Wide Workshop Foundation (WWWF), who also conducted the consent process, and made available for use in this study.

Population and Sample

The data presented in this study were collected from a population of administrators whose schools piloted the Globaloria: MyGLife program, (N=11),sample (n=7), in their schools during the 2007-08 and 2008-09 school years, and from a sample of four schools selected by the Globaloria staff. The pilot schools included public middle, high and technical schools as well as two alternative education agencies and a community and technical college. Of the 14 pilot sites, three represented settings outside the scope of this study (i.e., they were not public secondary schools). For that reason, the three sites representing the two alternative agencies and the community and technical college were excluded from this study, leaving 11 sites to participate.

The remaining 11 sites included six public high schools, four middle schools and one technical center. Ten of the 11 schools were classified as rural with the remaining one classified as urban. Enrollment ranged from 192 to 1203 students with a mean student population of 657. Class sizes were reported as ranging from 14.6 to 24 students with a mean class size of 19.68 students. The percentage of students from low income households ranged from 35.49% to 81.23% with a mean percentage of 50.91%. This particular statistic addressed the program developers' goal of bringing the Globaloria program first to students from households with low socio-economic status (SES).

Table 1 shows No Child Left Behind Data which were reported by all participating Globaloria pilot schools in West Virginia from the 2007-08 school year.

Table 1
No Child Left Behind Data for Globaloria Pilot Schools 2007-2008

	GD	ENR	SES	W	ATT	GR	GN	DO	CS
Clay Co. High	9-12	621	56.2	99.52	93.58	86.67	130	3.2	22.3
Man Senior High	9-12	404	44.06	96.29	93.52	80.00	80	5.4	16.9
Kasson Elem/Middle	P-8	192	51.56	98.44	98.44	N/A	N/A	N/A	14.6
Capital High	9-12	1203	47.46	65.50	95.37	72.95	240	7.0	17.8
Greenbrier E High	9-12	1159	42.11	94.31	95.42	80.41	238	7.1	19.3
Greenbrier W High	9-12	440	52.27	97.05	93.29	87.62	92	5.2	16.9
E. Greenbrier Middle	6-8	826	47.82	95.88	97.19	N/A	N/A	N/A	24.0
Randolph Technical	Non-NCLB School-No Data Reported								
Sandy River Middle	6-8	293	81.23	100.0	94.32	N/A	N/A	1.0	22.0
Spring Valley High	9-12	1158	35.49	98.45	95.08	79.85	218	5.6	23.3
Ceredo-Kenova M	6-8	271	50.92	98.15	97.48	N/A	N/A	N/A	19.7

Data reported included grades served (GD), enrollment (ENR), percentage of students receiving free and reduced lunch (SES), percentage of white students (W), attendance rate (ATT), graduation rate (GR), number graduated (GN), drop-outs (DO) and class size (CS.) Randolph Technical Center is a non-NCLB school and therefore did not report these data.

From the sample of four schools selected by the Globaloria staff to provide participating students' academic records, three schools reported the data. Of the population of 11 school sites, seven survey instruments were returned by principals for a return rate of 64%. The principals of all 11 sites were interviewed as a follow up to the

surveys, for a participation rate of 100%. The findings from these quantitative measures are reported below.

Quantitative Findings

There were three separate sources of quantitative data: the academic data of participating students for which consent had been obtained by the Globaloria staff, data collected by the Globaloria staff on their self-developed Contemporary Learning Abilities (CLAs), and data from the Globaloria Administrator Survey distributed to all principals of schools hosting the Globaloria project. This section reports the findings from those three sources.

Student Academic Records

Research Question 1- Do the skills acquired by students in the Globaloria program enhance outcomes in other academic contexts?

This research question focused on participating students' academic data. Requests were made of a sample of four of the 11 schools (identified by Globaloria staff, who also directed the consent process) to provide grade point averages (GPAs) in core courses (i.e., English/language arts, social studies, mathematics and science) WESTEST scores, class rank and attendance.

Grade Point Average

Difficulties were encountered in acquiring the data (one school simply declined to do so, despite Globaloria's request and signed consent forms), and in entering and subsequently analyzing the data based on the multiple formats in which they were received. Calculating GPAs, for example, turned out to be problematic since some schools followed the traditional seven- or eight-period day and others followed the block

schedule. It was finally determined that, in the absence of consistently reported data, the students' grades could only be compared to the same students' grades in the pre and post program academic terms. Those differences affected how GPAs were reported, the former reported four grades per course (one per each of four nine-week periods) and the latter reported two (one per semester). As a result, some students' aggregated records showed two grades for a core course (i.e., a first semester grade calculated by averaging the first and second nine weeks' grades and a second semester grade calculated by averaging the third and fourth nine weeks' grades), while others showed only one (i.e., in a block course). Moreover, in the latter case the records were silent on whether, for instance, the "B" shown was the result of two "Bs" assigned in each of the two nine-week periods or was rather the average of one "A" and one "C."

Students' individual grades in core courses, thus, were entered into SPSS for the year prior to their participation in the Globaloria initiative and the year after. Paired sample t-tests were executed on all student grade records (pre- and post-Globaloria), in the aggregate and per core subject, and no significant differences emerged. Subsequent paired sample t-tests isolating the pre- and post-data by sex and then by grade level were conducted as well, but the results were the same – no significant differences (Green, Lawson & Taylor, 2009).

Attendance

Absences were also reported differently, with some schools sending student absences per period per day and others showing only per day absences. Class rankings were provided by two schools, but not the third. Given this lack of uniformity in reporting the data, entering and analyzing them were necessarily difficult.

Achievement Tests

WESTEST scores were reported consistently across schools and did represent a non-problematic data source related to participating students' academic records. As the intent was to examine student academic performance both prior to and subsequent to participation in Globaloria, however, and as pre- and post-participation analyses would have required access to the 2008-09 test scores which had not yet been reported to the districts, those scores could not be used in this study. What remained, thus, of the four planned sources, was GPA.

Additional Data

As was mentioned in Chapter 1, Globaloria staff developed their own method for assessing students' progress, the Contemporary Learning Abilities (CLAs). The CLA instrument they devised used frequency on six specific technological and epistemological skill areas, reported by students before and after their participation in Globaloria. Caperton and Reynolds (2009) reported finding significant changes in students' frequency of engagement with each of the six CLAs identified, with students reporting increases in the frequency with which they 1) had progression and completion of an original digital project idea; 2) participated in and collaborated on project-based learning activities; 3) published digital media; 4) participated in social-based learning; 5) participated in information-based learning; and 6) surfed the internet for fun. While the majority of the changes noted were positive, two areas showed decreases in levels of frequency. Students in the public secondary schools (the subject schools for this study) showed a decrease in both social-based learning and surfing for fun.

Summary

In relation to the Research Question 1- Do the skills acquired by students in the Globaloria program enhance outcomes in other academic contexts? Extant student data indicated that there was no significant correlation between participation in the Globaloria program and student grades in other content areas, attendance or achievement test scores. Globaloria's developers conducted separate research which indicated that the Globaloria program has a positive effect on some of the Contemporary Learning Abilities (CLAs) and a negative effect on others. This means that while students did improve CLAs, their academic performance did not improve significantly.

Administrator Survey: Development of Qualitative Interview Questions

The Globaloria Administrator Survey was mailed to the 11 public secondary school principals whose schools participated in the pilot launch of the Globaloria program in West Virginia. Seven of the 11 principals of schools offering the Globaloria program responded to the Globaloria Administrator Survey (Appendix A) for a response rate of 64%. Self-reported demographic data included years of teaching experience and years of administrative experience, both of which were used as independent variables in various analytical processes using SPSS ® version16.0 to generate descriptive statistics, correlations, and linear regressions.

The first section of the Likert-style items on the Globaloria Administrator Survey (questions 5a, 5b and 5c) related to the administrator's understanding of the goals, objectives and overall implementation of the Globaloria: MyGLife program in her/his school. The second section of the Likert-style items (questions 5d and 5e) asked about the administrator's perceptions of the achievement of students, and the third section of the

Likert-style items (questions 5f and 5g) focused on the administrator's perception of the training received and skills developed by the participating teachers. The fourth section of the Likert-style items (question 5h) related to the willingness of the administrator to continue to participate in the Globaloria: MyGLife program and to recommend it to others.

Principals were asked to use the following scale: 5=Strongly Agree, 4=Agree, 3= Neither Agree nor Disagree, 2=Disagree, 1=Strongly Disagree. The table below shows the minimum and maximum scores assigned by principals, as well as the mean score and standard deviation for each item. The means of the responses are shown in Table 2.

Table 2:
Means of the Likert-style Questions from the Globaloria Administrator Survey

	Min	***Max***	***M***	***SD***
5a. The goals of the Globaloria program are clear to me.	4.00	5.00	4.5714	.50210
5b. The specific objectives of the Globaloria program (i.e., what students are supposed to learn) are clear to me.	3.00	5.00	4.2857	.71007
5c. The implementation of the Globaloria program in our location is clear to me.	3.00	5.00	4.5714	.73907
5d. Our students have learned valuable 21st Century workplace skills from the Globaloria program.	5.00	5.00	5.0000	.00000
5e. Our students have learned skills from the Globaloria program which will allow them to be more successful in their other classes.	4.00	5.00	4.5714	.50210
5f. Our participating teachers received adequate training before beginning the Globaloria program.	3.00	5.00	4.4286	.73907
5g. Our participating teachers have gained new technology skills through the Globaloria program.	4.00	5.00	4.8571	.35504
5h. I would recommend the Globaloria program to others.	5.00	5.00	5.0000	.00000

The responses to these Likert-style questions indicated that the school administrators who responded had a positive perception of all aspects of the program, with all mean scores falling in the agree-to-strongly-agree range. While the minimum scores were for items relating to knowledge of the specific objectives of the Globaloria program, the adequacy of training for participating teachers, and the implementation of the program at the school level, it is important to note that none fell below the "agree" level in the aggregate.

Means for two items, students' learning of 21st century workplace skills and recommending the Globaloria program to other administrators, scored consistently at the "strongly agree" level, indicating that principals felt especially strongly about them.

Bivariate correlational tests were conducted on each of the variables in the survey against each other variable. Where significant correlations between and among variables emerged, subsequent regression analyses were conducted to determine the strength of the relationship(s). In many, if not most, cases, the regressions attributed only slight explanatory power to the independent variable. For example, the correlation between administrators' understanding of the goals of the Globaloria program and their belief that teachers were acquiring new skills from work in the program yielded an adjusted R^2 of only .098, indicating that only 9.8% of the variance in responses could be attributed to understanding the goals of the program.

It was likely that the size of the population affected the statistical outcomes, making any conclusions about them suggestive rather than conclusive. The analyses were also clustered by variable to facilitate reading.

There was a significant correlation at the $p \leq .01$ level between the principal's understanding of the goals and her/his understanding of the objectives of the Globaloria program, as illustrated in Appendix C.

A significant correlation at the $p \leq .01$ level was also identified between the principal's understanding of the goals of the Globaloria program and her/his number of years of teaching experience, as outlined in Appendix D.

A correlation emerged between the principal's understanding of the goals of the Globaloria program and her/his understanding of the implementation steps of the Globaloria program, as outlined in Appendix E.

A correlation was identified between the principal's understanding of the implementation of the Globaloria program and her/his perception of improved student grades in other courses after the Globaloria program, as shown in Appendix F.

Qualitative Findings

Using data gathered from the Globaloria Administrator Surveys returned by administrators of the Globaloria pilot schools, questions were developed for follow-up interviews. All principals of the 11 pilot schools participated in the interviews (100%), which were recorded, transcribed using voice recognition software, and subsequently edited using notes taken during the interviews to ensure accuracy. Representative quotations are provided under each question.

Interview Question #4: Globaloria's academic aspects can be viewed as constructivist in nature – that is, the students are learning skills that they can potentially apply in other scenarios (like collaborative learning, problem-solving, etc.). Do you think that

participating in the program can affect the student's academic outcomes in other courses? Attendance? Behavior? Achievement test scores?

The interviews demonstrated that 91% of the principals with Globaloria in their schools believe that participation in the program *can* improve student performance in other academic contexts, although none was able to offer data in support of this position. One high school principal offered this response:

> Absolutely. I'm a firm believer that learning is not static. Learning does not occur in isolation, students learn things in relation to other things. Every information-gathering skill, device, information utilization aptitude or ability or whatever it is you do, you don't flick a switch and turn off the chemistry when you leave the classroom. You don't flick a switch and turn off the English/language arts when you leave the English classroom and so on and so forth …. [Globaloria] cannot help but facilitate increased achievement and improved performance in pretty much all other curricular areas, because the same skills undergird everything else that you do in every other area for the higher order thinking skills, the reasoning and problem-solving skills, the motivation. For the most part our kids said at the beginning 'What did I get into?' 'How can I get out of this?' 'It sucks!' 'I don't think I can do this!' After they were in there a couple of weeks, they became inspired to meet the challenges that this program presented. Once they met the challenge they couldn't wait to tell somebody else about it. We had kids that struggle just to get to school. This kind of lit a fire under them. I know of two kids who probably wouldn't have graduated this year if it hadn't been for this class. It does things to the inside of the kids, and tells

them ‘yes, I can! I can do this. I know a few things, I can do a few things, and I can do this and other things.’ That doesn't turn off when you leave Digital Imaging [one class in which the students participated in the Globaloria program]. You take it to geometry class, or chemistry class, or English class, or wherever you happen to be in the building.

A middle school principal agreed:

> Oh yes, [Globaloria] most definitely [improves students’ performance in general]. It gives them a little bit broader experience and gets them to play with things that they would not have regular access to in the regular classroom that they can utilize down the road. It builds teaming and sharing. With our program, if someone has discovered a process or way of doing something, they go back and teach it. It is the building of a concept. It is a building block of learning and education. Just like we do in education as principals – we don't know it all, but we sure do network and call each other. We did that with this program because it is trial and error lots of times for these kids and a lot of hard work. Once they do it, they are so proud to share. I think we as administrators do that. When we put something in our school, we are real quick to share, and I think that is a positive.

A second high school principal also felt Globaloria has the potential to improve students’ performance elsewhere:

> Absolutely. Absolutely. It teaches problem-solving skills, and I didn't know this until I saw it in their presentations. They have to learn a programming language

> and – it was neat – if one person had a problem, they can solve it as a group. So I think this can absolutely benefit students in other classes.

Several principals indicated that students are enthusiastic about the program, which they believed would lead eventually to both improved attendance and behavior for participating students. One middle school principal cited student achievement in his school:

> Some of our students who are sort of laid back with education have gone from being a 'C' student to an 'A' student just because of the program and utilizing it and seeing what's out there and [being] given the freedom to do it.

A high school principal addressed the issue of improved attendance and behavior:

> I think it can have an effect on attendance if students enjoy what they are doing. They look forward to coming to school. These kids really seemed to enjoy the game design that they did. As far as [standardized test] scores, I think it indirectly could affect those simply through problem-solving skills and being able to work through problems individually and in groups. I think it can have an indirect effect that way.

Another high school principal recounted a specific incident with students:

> I'll tell you about behavior as an example. Two students were performing as a collaborative team, and this is what they told the group when they presented to parent and teachers. They really didn't like each other. But working together in a team process allowed these kids to understand each other, and actually became friends. So yes, I see it actually affecting behavior too.

Research Question 2- What do principals perceive to be the purpose(s) of Globaloria?

Interview Question#1: What role do you believe technology should play in the classroom?

All of the responses to this question were generally positive in nature. The principals viewed technology as a tool to improving instruction as well as necessary to students' success in the future, but one which should be used with care in some cases. One high school principal elaborated:

> Technology should play a pivotal role. Technology should not supersede the teacher; technology should not be the be-all end-all. Technology for technology's sake is not good, but technology is the vehicle through which many more educational opportunities are made possible for students. Also, 'digital natives' as the kids are referred to, had never lived in a world without color TV, cell phones, PDAs and other such. Technology is an integral part of curriculum delivery. It is the way kids live. It is part of 21st-century skills, when kids come out of school. They need to have skill sets that will make them attractive to employers, including being well-versed in technology … Not just technology for technology's sake, but to teach kids things that they otherwise would not be able to learn, to facilitate kids learning. Technology to provide students with additional skill sets, etc.

This viewpoint was shared by a second high school principal who expressed some caution regarding the skills of teachers with technology:

> I believe the technology should be to help facilitate lessons, to help to augment what the teacher is doing. Not to be the sole source of the teaching – that I do believe. It plays a vital role. We are in the 21st century, and many things these days require a working knowledge of technology and our students have it. But unfortunately many of our teachers do not have enough and they need training desperately.

One middle school principal, however, offered a cautionary note regarding the current emphasis on technology:

> I've been through the 21st Century Principals Institute, and I think we are throwing the baby out with the bathwater. Technology is good. It is an addition. We cannot quit what we've been doing right for so many years – just wholesale quit what we have been doing and take on this new initiative. It has its place. But a lot of what they tell you in 21st century is [to] abandon the old and just pick this up, and that doesn't work. When you go to take your bar exam or your MCAT test, they are not going to let you Google the answers.

Interview Question #2: What do you understand the objective(s) of Globaloria to be? Are they consistent with your view on the role of technology in the classroom?

Responses to this question indicated that interviewees perceived the primary purposes of Globaloria to be 1) increasing student interest in learning and 2) developing 21st century skills in order to be more successful in school and the workplace. A middle school principal provided this summary:

> I would say that the goal of the Globaloria program would be to teach students 21st-century skills, advancing their knowledge and the way that they learn things; also to be able to collaborate with other schools through blogs and, you know, through phone calls if necessary. It is a learning experience students enjoy.

A high school principal reiterated that understanding:

> The skills that students are building in there – of course the use of technology, [but also] critical thinking skills and collaboration, not just within the classroom. They are using blogs and Skype to talk to the folks in New York and Charleston. And actually at Marshall [University] and various other sites that have the program in place. Those are the kinds of skills that students are going to need to be successful in the 21st century.

Another middle school principal offered the following:

> Globaloria has gotten these kids to utilize their imagination, putting it into a real-world situation. They are learning teaming; they are learning to go outside of their own little personal world to gather more information. Actually Globaloria, in my opinion, is getting exactly what we are trying to do in West Virginia in promoting 21st-century learning. I think it is an exciting and outstanding program.

Another high school principal was quite enthusiastic about discussing the skills students are acquiring:

Globaloria has a philosophy statement, and the idea of utilizing this social networking software to teach game development and to provide kids with skills that they need to compete in the global economy …. It has everything going for it that the research literature says about education: it has project-based learning; it has formative assessments; it has authentic assessment. It is about differentiated instruction and understanding by design. It is about 21st-century-learning skill sets. It is about interpersonal skills … being able to take and follow directions. It is about being able to lead and being able to follow. It has to do with the development of problem-solving skills, reasoning ability, higher order thinking skills. It has to do with … kids being able to work cooperatively in small and large groups, being able to collaborate. Globaloria has all of those features inherently built into it, and a number of other features that I find very, very appealing and attractive …. [I]f you look at my high school transcript you would think, 'This is a person who won't make it on to college.' If you looked at my college transcripts you would think, 'This is a person who is not able to do graduate school.' [But] I have two graduate degrees …. Globaloria brings that out in a kid. For a kid who is loquacious and talkative, it kind of calms them down. Kids who are shy and withdrawn and introverted, it sort of brings them out, because you have to work with other people. It's remarkable what I've seen this do … You have kids who want to stay after, to work on something. That is unheard of in schools anymore. Kids don't like homework, and they don't like being here period. That is a hook, because it is so indigenous to who they are, as they are 'digital natives.' They can't get enough of it. These are the type of

> things we need to be doing in every classroom so that kids will more readily embrace education, rather than reject it.

A third high school principal addressed how the program can change students' views:

> Globaloria is an opportunity to expand students' horizons, making them understand how to use software and how to use it in different mediums. It is a very creative opportunity for students and a great team-building collaborative opportunity. I had some apprehension, [but] as I have observed this year, I have seen students get very excited about that aspect and their academics. It expands students' horizons, their thought process, and also they are taking great pride in what they do. In that result, it does what I think technology should offer the students; they are just basically getting excited about learning.

Summary

The principals interviewed had an overall positive perception of the Globaloria program. The principals indicated that technology should be used as a tool to facilitate learning in the classroom. The same principals stated that the objectives of the Globaloria program were to increase student interest in learning and develop 21st century skills in order to be more successful in the classroom and the workplace.

Research Question 3- What do principals perceive to be their role(s), if any, in Globaloria?

Interview Question #3: What do you understand your role(s) to be in the Globaloria: MyGLife program? Did you feel prepared for this role? Did you have any special training to prepare you for your role in the program?

Most principals viewed their primary role in the initiative as one of facilitation and support. Coordinating resources such as time in the school schedule and funding for software and hardware were mentioned as primary responsibilities, as this interviewee explained:

> Just as anymore, education should be student centered. (It always should have been student-centered, but it wasn't.) We had the 'sage on the stage' focus on the teacher doing their number. Well right now, it is as it should be. The student is right at the center of the instructional process. I see the principal to be very much on the periphery of all of this. My job is to provide support, to facilitate. My job is to provide resources that will enable teachers and students to have the best possible environment in which to do those things that they are doing. I see my role as a principal, much as I see my role as a basketball official. I am not the game. No one comes there to see me blow the whistle. My job is to make certain that for those 10 people on the court, and that [for] the coaches and players on the bench inside that black line rectangle, [I have] put them in the very best possible position to have their talents and abilities and skills utilized to their fullest potential. That is my job as principal: to provide support, resources, and make it possible for this thing to be in the curriculum here at my school.

Another high school principal viewed himself explicitly as "support service":

> The training I received was from conversations with the representatives from Charleston and from Washington, DC. I have felt my role to be in a supportive role of the students and the teacher – to be a presence, to kind of roll up my sleeves and be there to be a part of what they are doing and to be in that support role. To make sure they have the resources that they need. So I have been a kind of support service, so to speak.

A middle school principal described the role a little differently:

> We [the principal and teacher(s)] went through some of the training just to get a feeling of what the children would be doing. I look at my role as promoting and encouraging, helping the students to understand where and what they are doing and how the world is so wide open. I like the idea of using a wide variety of students. It is not always the high-performing students that are going to excel in this. We have a good mixture. Globaloria has helped our school. I think the role of an administrator is to promote that, to acknowledge success and to promote it as far as we possibly can.

Summary

Most of the principals indicated that their primary role in the Globaloria program was one of facilitation and support. Coordinating resources such as time in the school schedule and funding for software and hardware were mentioned as primary responsibilities.

Research Question 4- What do principals perceive to be the benefit(s), if any, of having the program in their schools?

Interview Question #5: Are there benefit(s) to having the Globaloria program in your school? If so, what are they?

Of the principals interviewed, 91% reported observing positive benefits to their students and/or schools from hosting the Globaloria curriculum. Student enthusiasm and positive public relations were identified as two particular benefits. A middle school principal described students' reactions;

> The students love it. That is the first thing. You get up for a student who wants to go to class because they're doing something fun and exciting, because they are learning at the same time. That is always a plus. When they set down in a class that has to do the work, this is something different. [There is] something new to them practically every day – something different that they are learning. It is not boring, so to speak.

A high school principal shared his view of the program's publicity potential:

> Well, we've got an awful lot of good press from this program. In fact, on Tuesday, one of our teams will be going to Charleston to do a presentation of their results to Dr. Paine and Gayle Manchin, and some others. That is always good. It always speaks well. Mrs. Caperton and the other people from Globaloria have been here several times in the last two years, and that is always a good thing for a school like ours.

Another high school principal recounted several assets that accrue with hosting the program:

We have a webpage class, and we have benefited tremendously from being in Globaloria. We have our own in-house television studio and some of these kids participate in that. It gives kids more confidence to participate in other areas, such as the student council, honor society, etc., so you get a distribution out from the particular class. The skills these kids acquire! The kids that are in the … program, in their presentations they blow people away because these people are gamers themselves. They know or have a greater appreciation for what it takes to do that. It has helped us immensely. We had kids taking a class that are in Digital Photography also, and some of the things they've been able to create! It has been a good thing. We are going to try to encourage more and more teachers to utilize this. This is something that I feel crosses all boundaries. There are no limits. You can use this in any curricular area, and that is what we are going to try to encourage our teachers to do.

Summary

When asked about the benefits of having the Globaloria program in their schools, 91 % of the principals interviewed reported observing positive benefits to their students and/or schools from hosting the Globaloria curriculum. Student enthusiasm, development of 21st century workplace skills, enhanced usage of available technology and positive public relations were identified as particular benefits.

Research Question 5- What do principals perceive to be the liability (ies), if any, of having the program in their schools?

Interview Question #6: Are there disadvantages to having the Globaloria program in your school? If so, what are they?

Principals indicated that finding the time necessary for the program within the school schedule was a liability for the program. The expense of some of the required software and limited computer hardware resources were also reported as problematic. The availability of staff to facilitate and coordinate the program is also an issue for schools already facing diminished staffing due to budgetary reductions. One high school principal expressed his concerns regarding staff and resources:

> I think probably one of the disadvantages was that the teacher is one of my top-notch teachers, and it would've been nice if we could have had more than one 45-minute class per day. Also when they got close to the presentation, they [the students] had to do some after-school time. I think the abbreviated time allowed has hindered the program.

A second high school principal reported ongoing staffing concerns:

> Staffing is a problem. Every year …we seem to be losing population. I have required courses, and we already have set electives that students have been accustomed to being able to take each year to finish their career clusters. It is very difficult to find someone with a free period, so to speak.

A third high school principal expressed concern regarding the financial costs associated with the program:

> Well, I cannot say there are really any disadvantages, [except] that it is expensive. It is expensive to have the proper equipment, and even more so to have the latest

> software that is necessary. The software company, and the name just eluded me, does not give special pricing for schools.

Interview Question #7: Do you plan to continue the Globaloria: MyGLife program in your school? Why? Why not? If yes, do you plan to make any changes in the way the program is delivered in your school? If no, why have you decided to discontinue the program?

Ten of the 11 principals interviewed indicated that they plan to continue to utilize the Globaloria program within their schools despite the difficulties they cited. A middle school principal who responded in the negative to the question of continuing offered this rationale:

> It took 20 hours-plus a week on it and we dropped it. It was good for what it does. It just did not fit into our schedule. The teacher we had doing it is working on the 21st- century teachers thing for West Virginia also and it just did not pan out. They expected the teacher to do too much work when they have a full load. It would take a teacher who probably only taught half of her classes and then dedicated half her time to the Globaloria.

A high school principal indicated that he was amenable to continuing the Globaloria program in his school next year:

> We do plan to [continue the program], providing the schedule will allow us to do that. We are currently looking at our schedule for students next year. This past year, we had a teacher that did not have large numbers of students in class and we were able to use that [time for the program]. He is very good with technology. If we have the staffing, we plan to do that next year. We have sent one of our

> English teachers and are sending an English teacher and a special education teacher to be trained to hopefully use it in other courses. One is an 11th grade English teacher and the other one teaches math to learning disabled students, and they are team teaching. We are trying. Hopefully we'll be able to do it even if we do not have the one period to donate to the class.

Interview Question #8 Do you have any suggestions you would make to change the program before rolling it out to other schools?

The responses to this question were varied. Concerns expressed continued themes from previous questions, reiterating financial and staffing concerns and the need for additional training. A high school principal made this recommendation: "The only suggestion I would make is that the state give us money to hire one teacher specifically for that class …. It's a scheduling nightmare." Another high school principal indicated that training for principals in the program is a need:

> I just think it's a good idea to educate administrators so that they will know what the program is, because we piloted the program and I really wasn't sure about it. I know that an administrator from the board office attended the training, and she knew what it was all about. I think its necessary that [building-level] administrators know what the program is and what the benefits of it are.

A third high school principal addressed the need for different preparation for participating schools:

> The only thing I would suggest is that I think we need to give schools more of an opportunity to receive some training, professional development. Maybe a little

further out on the time frame, rather than just kind of training ‘in the fire’ the summer before it starts. I know it's difficult to do, but I think there should be some introductory things taking place, maybe some observations. Send the team out to observe another school the semester before they initiate the program in a school.

Summary

The principals interviewed indicated that, though a majority of them supported the program and perceived that the program provided benefits for the students, there were some areas of concern. These concerns included finding time for the program in the school day, the expense of the required software and limited computer hardware resources and the need for additional training for principals. Despite these concerns, 10 of the 11 principals indicated that they planned to continue the program if resources were available to provide it.

Summary of the Study

This study was undertaken primarily to gauge the perceptions of Globaloria-participating schools’ principals regarding the program and to attempt to determine whether the program affects students’ outcomes in other academic contexts. A mixed-method approach utilizing extant student data, administrator surveys, and interviews with principals in schools that have adopted the Globaloria program was utilized to address the study’s research questions:

- Do the skills acquired by students in the Globaloria program enhance their outcomes in other academic contexts?

- What do principals perceive to be the purpose(s) of MyGLife?
- What do principals perceive to be their role(s), if any, in MyGLife?
- What do principals perceive to be the benefit(s), if any, of having the program in their schools?
- What do principals perceive to be the liability (ies), if any, of having the program in their schools?

The surveys, returned by 64% of the population, indicated strong support for recommending the Globaloria program to colleagues and for students' learning valuable 21st -century workplace skills. The principals who responded had a positive perception of all aspects of the program, with all mean scores falling in the agree-to-strongly-agree range. While the minimum scores were for items relating to knowledge of the specific objectives of the Globaloria program, the adequacy of training for participating teachers, and the implementation of the program at the school level, it is important to note that none fell below the "agree" level in the aggregate.

Subsequent interviews, completed with 100% of the population of principals in Globaloria pilot schools, revealed an overall positive impression about having the program in their schools. The principals indicated that they believe technology is a powerful tool in the classroom that stimulates student interest and enthusiasm, and the Globaloria program is viewed as a means to provide students with skills which would not only transfer into other courses, but also prepare students for the workplace of the 21st century. Interest and enthusiasm were mentioned as being positive benefits of the program for students.

Most principals perceived the goals of the Globaloria program as offering students experiences to improve their skills in using technology, cooperative teaming, and problem-solving. The role of the principal in the program was described primarily as being a supporter and/or facilitator, providing access to financial, software, hardware and human resources necessary for the program to work. One principal advised caution, however, indicating that technology has its uses but must not become the sole focus of the classroom.

Disadvantages to the Globaloria program related to staffing requirements, financial investment in software and hardware, and increased usage of computer resources such as computer labs. Ten of the 11 principals in the pilot program, however, indicated that they wished to continue the program in their schools. The program has been discontinued in one school due to what the principal considered unrealistic expectations for student time and school resources. Suggestions for improving the program focused upon the need for more training for teachers and principals. Additional funding for personnel and software were cited as needed improvements.

CHAPTER 5: CONCLUSIONS & RECOMMENDATIONS

This study served as an investigation of a pilot technology program in selected West Virginia public secondary schools. Globaloria: MyGLife focused on helping students develop skills in game development and global awareness in the context of a problem-based learning project (Reynolds & Caperton, 2009). There were two subjects of investigation in the study: whether participation in Globaloria improved students' overall academic performance and how the principals in Globaloria-participating schools viewed the goals, objectives, benefits and liabilities of the project as well.

Data were collected through a researcher-designed survey, the *Globaloria Administrative Survey* (Appendix A), distributed to all principals of participating schools in the 2007-08 and 2008-09 school years; through academic records of participating students for whom consent had been obtained; and through interviews with all principals of participating schools. The results of those data analyses were reported in Chapter Four. This chapter will briefly summarize those findings, provide answers to the questions that guided the research, discuss what may be concluded from those answers, and offer recommendations for further research.

Summary of Findings

A mixed-method approach was determined to be the most effective means of answering the research questions for the study. There were two elements to the quantitative process: an investigation of potential differences in students' academic outcomes after having completed the Globaloria project and a researcher-designed survey sent to all principals of schools offering the Globaloria program. The qualitative element

involved interviewing all of the identified principals and listening to audio transcripts of student focus groups conducted by other researchers.

The examination of students' academic records returned nothing of significance. An unanticipated limitation arose as a result of the different formats in which these records were reported, and those differences precluded any across-schools analyses. Green, Lawson and Taylor (2009) conducted within-school analyses, but paired-sample t-tests failed to return any findings of significance.

The surveys, returned by 64% of the principal population, indicated strong support for the Globaloria program with all mean scores falling in the agree-to-strongly-agree range. Subsequent interviews, completed with 100% of the population of principals in Globaloria's pilot schools, also revealed an overall positive impression about having the program in their schools, specifically about its relationship to 21st century skills, postsecondary or job preparation, and collaboration/teaming. Student comments supported that impression.

Expressed disadvantages to the Globaloria program related to staffing requirements, financial investment in software and hardware, and increased usage of already scarce computer resources such as labs. Ten of the 11 principals in the pilot program, however, indicated that they wished to continue the program in their schools. Suggestions for improving the program focused upon the need for more training for teachers and principals. Additional funding for personnel and software were also cited as a needed improvement.

Answers to Research Questions

As was discussed in the review of the literature (Chapter 2), the work of Papert in constructionism and of constructivists Dewey, Piaget, and Vygotsky were all seen as relevant to this study. Vygotsky's (1978) emphasis on the dependence of the individual's cognitive development on the cultural context within which it was embedded, however, and his concept of the "tools of intellectual adaptation" made his activity theory the most appropriate for examining the Globaloria technology initiative.

Vygotsky, through his activity theory, posited that activities undertaken by individuals with problems to solve or purposes to achieve would be accomplished through collaboration with others and/or mediated through the use of available tools of the culture which they have learned to use. Culture, in activity theory, made two sorts of contributions to individuals' intellectual development. First, individuals acquired much of their thinking, information or knowledge from the culture (i.e., it was a source of what to think and what to think about). Second, they acquired the processes or means of their thinking (i.e., the "tools of intellectual adaptation") from the surrounding culture.

Vygotsky's perspective was that children can be only as cognitively developed as the culture they inhabit allowed them to be. Learning experiences in the Globaloria program were grounded in a cultural perception that among the skills necessary for students to navigate postsecondary education or the job market in the 21st century were teaming and collaboration. That perception was borne out in multiple comments of both principals and students in the Globaloria pilot schools. Moreover, students in the program engaged in their collaborative work using the most ubiquitous of our contemporary "tools of intellectual adaptation" – the computer.

Research Question 1- Do the skills acquired by students in the Globaloria program enhance outcomes in other academic contexts?

To answer this question, the academic records of participating students for whom consent had been obtained by the Globaloria staff were requested and analyzed. These records presented an unexpected limitation: the responding schools used different collection and reporting formats. Of the records requested (i.e., grade point average in core subjects and overall, state standardized test scores, class rank, and attendance), only the grades reported showed any consistency among schools. Some reported test scores, others didn't; none had state standardized test scores for the 2008-09 academic year (which were not available until August or September, 2009); some either did not provide or did not have students' rankings in their classes (middle schools, for example, did not record that information); and methods for recording absences seemed to be as unique as the schools. That being the case, across-schools analyses/comparisons could not be conducted.

Within-school analyses of students' grades in the core (i.e., English/language arts, social studies, mathematics and science) and overall GPAs however, could be conducted with the records from three of the 11 pilot schools. These records allowed a comparison of students' performance pre- and post-Globaloria using paired-sample t-tests (Green, Lawson & Taylor, 2009). There were, however, no findings of significance.

Qualitative interviews with the principals of the schools in which the Globaloria program was piloted indicated that it was the belief of the principals that the program either was having or would have a positive effect on the academic outcomes of their students. One principal recounted that specific students had raised their grades in their

other academic courses after participating in the program, although with the disparities in the records this observation could not be confirmed.

Should this perceived improvement in grades be borne out, that improvement could be consistent with Vygotsky's theory that students gain skills through collaborative problem-solving activities that involve the use of available cultural tools which are not gained by students working independently. The necessary research parameters for statistically establishing Globaloria's consistency with Vygotsky's activity theory are addressed in the following section on recommendations for further study.

A separate study conducted by Globaloria's developers indicated that the Globaloria program had a positive effect on some of the Contemporary Learning Abilities (CLAs) they had established as measures of progress. The CLA instrument used frequency on six specific technological and epistemological skill areas, reported by students before and after their participation in Globaloria. Caperton and Reynolds (2009) reported finding significant changes in the frequency with which students reported that they 1) had completed an original digital project idea; 2) participated in and collaborated on project-based learning activities; 3) published digital media; and 4) participated in information-based learning; While the majority of the changes noted were positive, two areas showed decreases in levels of frequency. Students in the public secondary schools (the subject schools for this study) showed a decrease in both social-based learning and surfing for fun.

The scope of this component of the study, however, was limited to students' academic records in curricular or co-curricular activities outside of Globaloria. Given the absence of uniformity in student academic data and subsequent problems in generating

any meaningful analyses, the answer to this research question will have to be "no" at this time.

Research Question 2- What do principals perceive to be the purpose(s) of Globaloria?

This question was addressed through qualitative interviews with the principals of the 11 schools piloting the Globaloria program. By far, the most common response of the interviewees was that the primary objective of the Globaloria program was to develop 21st century skills in order to be more successful in the classroom and the workplace. Several also mentioned a goal of increasing student learning in general, and reported that a "side benefit" was that the program made students more enthusiastic about school.

While enthusiasm about learning was not explicitly addressed in Vygotsky's work, his belief in the social negotiation of knowledge and in the use of "tools of intellectual adaptation" was consistent with the understanding of 21st century skills offered by the West Virginia Department of Education (What are 21st century learning skills?, n.d.).

> Twenty-first century learning skills [include] … using research tools, such as word processing, e-mail, presentation software and the Internet, to access, manage, integrate, create and communicate with others ... [Students will] demonstrate the ability to work well with diverse teams and exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal. They also assume a shared responsibility for collaborative work.

The answer to this research question – learning 21st century skills in order to be more successful in both the classroom and the workplace – was thus representative of both Globaloria's own statement of purpose and of Vygotsky's activity theory.

Research Question 3- What do principals perceive to be their role(s), if any, in Globaloria?

Answers to this question were acquired from the qualitative interviews with the principals of the schools piloting the Globaloria program. Most of the principals indicated that the principal's primary role in the Globaloria program was one of facilitation and support. Coordinating resources such as time in the school schedule and funding for software and hardware were mentioned as primary responsibilities. The issue of resources was one that resonated with the principals (as is also discussed in responses to the fifth research question below). The Globaloria project could effectively support constructivist learning because of its emphasis on using technological resources (which learners could use for knowledge construction) and its collaborative structure. Students, as Vygotsky hoped, could both build knowledge and test it through social negotiation. Their ability to do so, however, was dependent upon access to the necessary hardware and software resources. Interviewees' answer to this question – viewing their chief role as facilitators – was complicated by the general scarcity of resources in the state's public education sector.

Research Question 4- What do principals perceive to be the benefit(s), if any, of having the program in their schools?

Qualitative interviews with the principals of the schools piloting the Globaloria program provided the answers to this question. When asked about the benefit(s) of having

the Globaloria program in their schools, 91 % of the principals interviewed reported observing positive benefits to their students and/or schools from hosting the Globaloria curriculum. As was the case with responses to the second research question (i.e., regarding the perceived purpose(s) of the Globaloria program), principals identified the development of 21st century workplace skills, expanded use of the available technology and student enthusiasm as particular benefits. Interestingly, they also cited positive public relations as a benefit.

As the responses to this research question were nearly identical to the principals' responses to the second research question, the same relationship to Vygotsky's thinking and to the West Virginia Department of Education's (WVDE) 21st Century Learning Skills was in evidence here, with the exception of student enthusiasm and improved public relations.

The answer to this research question – the acquisition and practice of 21st century skills and the use of emerging technologies in order to be more successful in both the classroom and the workplace – was, as was the case with the research question concerning the principals' perceptions of the purpose of Globaloria, consistent with central elements in activity theory. The connection between developing the skills necessary to function in a 21st century environment and transferring those skills beyond the Globaloria classroom to other learning environments was specifically addressed by Vygotsky: "Every function in the child's cultural development appears twice: first, between people … and then inside the child" (1978, p. 57).

The skills that Globaloria students developed in their collaborative work, if Vygotsky and his fellow constructivists (as well as the principals interviewed for this

study) were correct, would be gradually internalized so students could use them to direct their own learning. The concept of "tools of intellectual adaptation" was especially important in this regard. Vygotsky wrote (1978) that these tools were not only representative of the culture and a means of acquiring knowledge, but that they provided avenues for the transmission of knowledge as well. They could be used as a means of community formation through which learners could share and test ideas.

Research Question 5- What do principals perceive to be the liabilities, if any, of having the program in their schools?

To answer this question, information was drawn from both the *Globaloria Administrator Survey* and the qualitative interviews. The principals interviewed indicated that while a majority of them supported the program and perceived that the program provided benefits for their students, there were some areas of concern. These concerns included finding time for the program in the school day, the expense of the required software, limited hardware resources, and the need for training for principals. Despite these concerns, 10 of the 11 principals indicated that they planned to continue the program if resources were available to provide it. One respondent indicated that he had discontinued the program in his building due to what he considered to be extreme demands of student time and school resources.

Principals indicated that they had not been afforded specialized training for principals relating to the Globaloria program. One principal indicated that specific training for principals would be his recommendation for improving the program before extending it into other schools. While he did not elaborate on what should be included in such training, his observation was an implicit recognition of the importance of

Vygotsky's "zone of proximal development" (ZPD) – the zone he defined as the distance between what a learner could achieve on his own and what he can achieve with the guidance of more capable others, peers or adults. The process was sometimes referred to as "scaffolding" or guided participation (Wood, Bruner & Ross, 1976), the support provided by more competent others to learners who could expand their understandings through the interaction, and it was central to Globaloria's implementation.

Conclusions and Discussions of Implications

Like all constructivists, Vygotsky believed that we are our own teachers, declaring that "[f]rom a scientific point of view, strictly speaking, you cannot educate anyone else" (in Oscarsson, 2001). Learning, however, was a socially mediated activity for Vygotsky, and one that involved the tools of contemporary culture. Alexei Leontjev (1978), expanding Vygotsky's work, wrote that consciousness and meaning were always formed in joint, collective activity. As a result, Leontjev believed, the proper unit of analysis in studying human mediated activity was an activity system – a community of actors who had a common object of activity. The Globaloria project constituted such a system, which made it an excellent venue in which to investigate Vygotsky's work.

The culture in which Globaloria students were developing the "21st century skills" cited by the principals followed Vygotsky's theory regarding the importance of culture in learning. By capitalizing on the students' inclination to interact using online social networks, the Globaloria program brought the students' own culture into the classroom and allowed that culture to enhance the learning environment. By utilizing contemporary "tools of intellectual adaptation," in this case hardware, software and the internet, students were developing new and expanding already acquired skills.

As was noted in the first chapter of this study, rigid performance requirements imposed upon schools since the advent of the No Child Left Behind Act (NCLB) in 2002 made it increasingly important that programs operating in our schools served to improve student achievement on standardized testing, the primary indicator of success under NCLB. While the dimensions of NCLB might shift under the new administration and Congress, contemporary principals must continue to exercise caution in adding programs to their schools that have not demonstrated a positive effect on student academic outcomes.

Increases in standardized test scores, however, should not have been used as the only measure of a successful program for students, and there were signs that this mindset was changing (e.g., changes in content standards for K-12 schools, the interest in teaming or collaborative work as part of "21st century skills," the emphasis on "soft" skills by employers, etc.). As the principals whose schools participated in the Globaloria program reported that their students were developing valuable 21st century skills for collaboration and teaming as well as a more expansive utilization of technology in their projects, it could be argued that this program was valuable and should continue. The majority of principals interviewed, 91% of the pilot group, fully intended to continue the program in their schools. They, along with their students, were enthusiastic about the skills that the students have already learned and were eager to see what continued participation in the program would bring in the future.

The interviews also indicated some potential directions for improvement, among them continued training for participating teachers and principals to ensure the quality of the program in their schools. Teachers must have adequate training in constructivist

practices (i.e., scaffolding and guided participation) to meet the needs of their students, while principals must understand the overall goals and implementation of the program in their schools if they were to act as effective facilitators.

Finally, principals also indicated that funding for staff and technology resources for the Globaloria program were of major concern. Finding the fiscal resources to ensure the program's success was identified as a potential problem early on by Globaloria developers (cf., see "Perceived Obstacles" in Chapter 1). While identifying potential sources for increased funding was beyond the scope of this study, it is recommended that Globaloria and its partner agencies in the state continue to make funding a priority. While the interviews conducted for this study indicated that principals in participating schools were quite positive about the program, they also endured a chronic scarcity of resources. It would therefore be beneficial for planners, including local partners, to continue to focus on how additional funding might be found to secure these needed resources. With the current strong support from the participating principals the program should be continued in the pilot schools and expanded into new schools as planned.

Recommendations for Further Research

As the program continues implementation in schools with the goal of expanding first statewide and then nationwide, it would be beneficial to continue to gather both quantitative student achievement data and qualitative input from participants (i.e., students, teachers and principals) in order to assess the program's benefits and/or liabilities for participating students and schools. As the program was only in its initial stages of implementation in pilot schools in select locations, it was not possible to draw enough data to make definitive statements as to benefits and/or liabilities which the

program may generate. The findings and conclusions herein are thus suggestive rather than conclusive. Still, it is possible to offer some recommendations for further study of phenomena such as Globaloria.

First, while large numbers of students would have to be tracked for long periods of time before a sufficient numbers of cases would exist to provide statistically meaningful quantitative results, it is recommended that a longitudinal study be undertaken that examines students' performance prior to participation in Globaloria and afterward. This recommendation itself generates two additional suggestions.

Second, it is recommended that all quantitative data reported from schools conform to a uniform reporting standard. This would facilitate the collection, entering and analysis of data, allow for a more thorough investigation of participating students' performance, and improve the accuracy of findings.

Third, it is recommended that a control group of students who are not Globaloria participants be identified and incorporated into the study in order to provide a basis for comparison. This too would enhance the accuracy of findings and strengthen the study.

The cultural aspects of Vygotsky's work were especially interesting when applied to the learner in the contemporary technological environment, full of developments he could not have foreseen. His activity theory remains relevant nonetheless.

REFERENCES

Ackermann, E. (2001). Piaget's constructivism, Piaget's constructionism: What's the difference? Retrieved March 11, 2009 from http://learning.media.mit.edu/content/publications/EA.Piaget%20_%10Papert.pdf

Alberta Report. (1998, December 28). Schools vs. progress. *Alberta Report Newsmagazine* , p. 38.

Alliance for Childhood. (2004). *Tech tonic: Towards a new literacy of technology* . College Park, MD: Alliance for Childhood.

Angelo, J. M. (2002, July). IT spending to reach $9.5 billion. *District Administration* , p. 6.

Armstrong, A., & Casement, C. (2000). *The child and the machine: How computers put your children's education at risk.* Beltsville, Maryland: Robins Lane Press.

Association of Computer Machinery. (1996). School spending. *Communications of the ACM* , 9.

Baker, E. L., Gearhart, M., & Herman, J. L. (1993). *The Apple classrooms of tomorrow: The UCLA evaluation studies (CSE Report No. 353).* Los Angeles, CA: University of California-Los Angeles.

Ball, D. (1988). Unlearning to teach mathematics. *For the Learning of Mathematics* , pp. 40-48.

Bandura, A. (1977). *Social learning theory.* New York: General Learning Press.

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice-Hall.

Barack, L. (2006, February). Digital textbooks for digital natives. *School Library Journal* , p. 24.

Bayraktar, S. (2001-2002). A meta-analysis of the effectiveness of computer-assisted instruction in science education. *Journal of Research on Technology in Education* , 173-188.

Beck, C. & Kosnik, C. (2006). *Innovation in teacher education: A social constructivist approach*. Albany: State University of New York Press.

Beers, P. J., Boshuizen, H. P., Kirschner, P. A., & Gijselaers, W. H. (2005). Computer support for knowledge construction in cooperative learning environments. *Computers in Human Behavior* , 623-643.

Blunden, A. (2005). *What is pragmatism? Transcription of a speech by William James 1906.* Retrieved February 11, 2008, from Marxists.org: http://www.marxtists.org/reference/subject/philosophy/works/us/james.htm

Bodilly, S., & Mitchell, K. J. (1997). *Evaluating challenge grants for technology in education.* Santa Monica, California: Rand Corporation.

Bogdan, R., & Biklen, S. K. (2007). *Qualitative research for education: an introduction to theories and methods. 5th Edition.* New York: Pearson Education, Inc.

Brief, J-C. (1986). *Beyond Piaget: A philosophical psychology*. New York: John Riley.

Bruner, J. (1960). *The process of education.* Cambridge, MA: Harvard University Press.

Bruner, J. (1966). *Toward a theory of instruction.* Cambridge, MA: Harvard University Press.

Bruner, J. (1985). *Actual minds, possible worlds.* Cambridge, MA: Harvard University Press.

Bruner, J. (1996). *The culture of education.* Cambridge, MA: Harvard University Press.

Bush, G. (2005). Logging on to staff development. *T.H.E. Journal* , 14-18.

Bybee, R. W., & Loucks-Horsley, S. (2000, October). Advancing technology education: The role of professional development. *The Technology Teacher* , pp. 31-34.

Byrnes, J. P. (2001). *Minds, brains, and learning.* New York: Guilford Press.

Caperton, I. H., Sullivan, S., & Oliver, A. (2008). *Globaloria: Empowering youth worldwide to create and collaborate online.* New York: World Wide Workshop Foundation.

Caperton, I. (2008). *The case for the Globaloria network in West Virginia: Empowering West Virginia youth to collaborate online with a 21st century game-making curriculum, Year 1 Executive Report.* World Wide Workshop Foundation.

Casner-Lotto, J., & Barrington, L. (2006). *Key findings; Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce.* Retrieved March 13, 2009, from Partnership for 21st Century Skills: http://www.21stcenturyskills.org/documents/key_findings_joint.pdf

Chandra, V., & Lloyd, M. (2008). The methodological nettle: ICT and student achievement. *British Journal of Educational Technology* , 1087-1098.

Childress, V. (2004, September). Message from the president of the TECC. *Technology and Children* , p. 3.

Christmann, E., & Badgett, J. (1997). Progressive comparison of the effects of computer-assisted instruction on the academic achievment of secondary students. *Journal of Research on Computing in Education* , 325-338.

Clark, O. (2005, October). Engaging the digital natives in learning. *Primary & Middle Years Educator* , pp. 20-25.

Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2008). *Scaling the digital divide: Home computer technology and student achievement.* Durham, NC: Duke University.

Clough, M. &. (2001, September/October). Technology's tendency to undermine serious study: A cautionary note. *The Clearing House* , 8-13.

Cohen, M. (2000). What is the educational value of IT? . *Dissertation* . University of Exeter.

Cradler, J., McNabb, M., Freeman, M., & Burchett, R. (2002). How does technology influence student learning? . *Learning & Leading with Technology* , 46-49 & 56.

Cuban, L. (1993). Computers meet classroom: Classroom wins. *Teachers College Record* , 185-210.

Cuban, L. (2001). *How can I fix it? Finding solutions and managing dilemmas.* New York: Columbia University.

Cuban, L. (2002). *Oversold and underused: Computers in the classroom.* Cambridge, Massachusetts: Harvard University Press.

Daniels, H., Leadbetter, J., Soares, A., & MacNab, N. (2007). Learning in and for cross-school working. *Oxford Review of Education* , 125-142.

Darst, P. (2009, May29-June 4). Global connection: Pilot education project takes aim at teaching students through interactive web tools. *The State Journal* , p. 1 & 4.

Debate: Larry Cuban & Roy Pea. (n.d.). Retrieved February 11, 2008, from Tapped In: http://www.tappedin.org/info/teachers/deate.html

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education.* New York: Free Press.

Dewey, J. (1938). *Experience and education.* New York: Touchstone.

Dewey, J., & Editor Archambault, R. D. (1964). On education. Chicago, Illinois: University of Chicago Press.

Dickard, N. (2003, March). *The sustainability challenge: Taking EdTech to the next level.* Retrieved February 22, 2008, from Benton Foundation, benton.org: http://www.benton.org/publibrary/sustainability/sus_challeng.html

Duckworth, E. (2006). *The having of wonderful ideas: And other essays on teaching and learning*. New York: Teachers College Press.

Duffy, T. M., & Jonassen, D. H. (1992). *Constructivism and the technology of instruction.* Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Dwight, J., & Garrison, J. (2003). A manifesto for instructional technology: Hyperpedagogy. *Teachers College Recor* , 628-699.

Dyson, E. (2004, July/August). A look at 2020. *American Demographics* , pp. 34-35.

Earle, R. (2002, January-February). *The integration of instructional technology into public education: Promises and challenges.* Retrieved February 22, 2008, from bookstoread.com: http://www.bookstoread.com/etp/earle.pdf

Ellis, A. B. (2006, April 14). Creating a culture of innovation. *Chronicle of Higher Education* , p. B20.

eSchoolNews. (2008, May 14). *Parents unsure about kids' digital media use.* Retrieved May 14, 2008, from eSchoolNews.com: http://www.eschoolnews.com/news/top-news/?i=53773;_hbguid=06decc0d-abe4-4cf6-a682-b8dc4418f37e

Fosnot, C. T. (2005). *Constructivism: Theory, perspectives and practice.* New York, New York: Teachers College Press.

Foster, R. (2003, November 21). *Adolescent brain development vulnerabilities and opportunities.* Retrieved January 31, 2008, from New York Academy of Sciences: http://www.nyas.org/ebriefreps/print.asp?intEbriefID=219

Fox, R., & Henri, J. (2005). Understanding teacher mindsets: IT and change in Hong Kong schools. . *Educational Technology & Society* , 161-169.

Friedman, T. L. (2005). *The world is flat.* New York: Farrar, Straus and Giroux.

Fuchs, T., & Wößman, L. (2005). *Computers and student learning: Bivariate and multivariate evidence on the availability and use of computers at home and at school.* Munich, DE: Ifo Institute for Economic Research at the University of Munich.

Gagnon, G. W., & Collay, M. (2001). *Designing and learning, six elements in constructivist classrooms.* Thousand Oaks, Califiornia: Corwin Press.

Gardner, H. (1995). *The unschooled mind.* New York: Basic Books.

Garrison, J. (1995). Deweyan pragmatism and the epistemology of contemporary social constructivism. *American Educational Research Journal*, 32 (4), 716-740.

Gay, L. R., Mills, G. E., & Airasian, P. (2006). *Educational research competencies for analysis and applications.* Upper Saddle River, New Jersey: Pearson Education Inc. .

Gehring, J. (2005, May 5). Big-District Priorities. *Education Week* , pp. 38-39.

Ginserb, R., & McCormick, V. (1998). Computer use in effective schools. *Journal of Staff Development* , 22-25.

Globaloria West Virginia. (2008). Retrieved September 22, 2008, from MyGLife.org: MyGLife.org/USA/WV

Green, J. O. (1984). B. F. Skinner's technology of learning. *Classroom Computer Learning* .

Green, J., Lawson, D. & Taylor, G. (2009). Effects of the Globaloria program on student grades. Unpublished manuscript.

Gregorian, V. (2005, December 9). Grounding technology in both science and significance. *Chronicle of Higher Education* , pp. B3-B5.

Gulek, J. C. (2005). Learning with technology: The impact of laptop use on student achievement. *Journal of Technology, Learning and Assessment* .

Hammonds, S. (2003). Impact of internet-based teaching on student achievment. *British Journal of Educational Technology* , 95-98.

Hartley, S. S. (1977). Meta-analysis of the effects of individually paced instruction in mathematics. *Doctoral dissertation* . University of Colorado.

Hayhoc, G. (2005, August). The future of technical communication. *Technological Communication* , pp. 265-266.

Healy, J. (1999). *Failure to connect: How computers affect our children's minds-and what we can do about it.* New York: Simon & Schuster.

Herring, M. C. (2004). Devlopment of constructivist-based distance learning environments, A knowledge base for k-12 teachers. *The Quarterly Review of Distance Learning* , 231-242.

Hew, K. F., & Brush, T. (2007). Integrating technology into k-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Education Technology Research Development* , 223-252.

Hikmet, N., Taylor, E., & Davis, C. (2008). The student productivity paradox: Technology mediated learning in schools. *Communications of the ACM* , 128-131.

Hill, A. M. (2005). Research in purpose and value for the study of technology in secondary schools: A theory of authentic learning. *International Journal of Technology and Design Education* , 19-32.

Hilton, J. K. (2003). The effect of technology on student science achievement. *ProQuest Dissertations and Theses-Full Text, 765197851. (UMI No. 3115610).*

Hirsch, J. ,. (2009, February 24). *The 21st century skills movement.* Retrieved March 13, 2009, from commoncore.org: http://commoncore.org/pressreleases-4.php

Hohlfeld, T., Ritzhaupt, A., Barron, A., & Kemker, K. (2008). Examining the digital divide in k-12 public schools: Four-year trends for supporting ICT literacy in Florida. *Computers & Education* , 1648-1663.

Holt, J. (1983). *How children learn.* Cambridge, Massachusetts: Da Capo Press.

Huitt, W. (2003). *Constructivism.* Retrieved February 11, 2008, from http://chiron.valdosta.edu/whuitt/col/cogsys/construct.html

Jensen, E. (2006). *Enriching the brain: How to maximize every learner's potential.* San Francisco, California: Jossey-Bass.

Jing, L., & Yong, Z. (2007). Technology uses and student achievement: A longitudinal study. *Computers & Education* , 284-296.

Johnson, R. T., Johnson, D. W., & Stanne, M. B. (1986). Comparison of computer-assisted cooperative, competitive, and individualistic learning. *American Educational Research Journal* , 382-392.

Jones, L. K. (n.d.). *The foundation skills, job skills all workers need*. Retrieved April 8, 2009, from The Career Key: http://www.thecareerkey.org/asp/career_development/people_skills.asp

Jukes, I., & Macdonald, B. (2007, November 16). *21st century fluency skills.* Retrieved February 11, 2008, from thecommittedsardine.net: http://web.mac.com/iajukes/thecommittedsardine/Handouts.html

Kafai, Y., & Resnick, M. (1996). *Constructionism in practice: Designing, thinking, and learning in a digital world.* Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc. .

Kandel, E. R. (2006). *In search of memory.* New York: W.W. Norton and Company.

Kanuka, H. &. (1999). *Using constructivism in technology-mediated learning: Constructing order out of the chaos in the literature.* Retrieved February 18, 2008, from radicalpedagogy.icaap.org: http://www.radicalpedagogy.icaap.org/content/issue1_2/02kanuka1_2.html

Karmarkar, U., & Apte, U. M. (2007, March). Operations management in the information economy: Information Products, Processes, and Chains. *Journal of Operations Management* , pp. 438-453.

Karoly, L. A., & Panis, C. W. (2004). *The 21st century at work, forces shaping the future workforce and workplace in the United States.* Santa Monica, CA: RAND Corporation.

Karpyn, A. E. (2003). School technology use and achievement on statewide assessment: Is there a relationship? *ProQuest Dissertations and Theses-Full Text, 76057391. (UMI No. 3095897).*

Kellner, D. (2006, Fall). Education and the academic left: Critical reflections on Todd Gitlin. *College Literature* , pp. 137-154.

Kerlinger, F. N., & Lee, H. B. (2000). *Foundations of behavioral research (4th ed.).* Fort Worth, TX: Harcourt College Publishers.

Khoo, A., & Gentile, D. (n.d.). *Problem-based learning in the world of digital games.* Retrieved February 11, 2008, from psychology.iastate.edu: http://www.psychology.iastate.edu/faculty/dgentile/publications.htm

Kulik, J. A. (2003). *Effects of using instructional technlology in elementary and secondary schools: What controlled evaluation studies say.* Arlington, VA: SRI International .

Lambert, L., Walker, D., Zimmerman, D., Cooper, J., Lambert, M., Gardner & Szabo, M. (2002). The constructivist leader. New York: Teachers College Press.

Leontjev, A.N. (1978). Activity, consciousness and personality. M. Hill (Trans). New York: Prentice-Hall.

Lewnschow, R. J. (1998). From teaching to learning: A paradigm shift in engineering education and lifelong learning. *European Journal of Engineering Education* , 155-161.

Liao, Y. (1992). Effects of computer-assisted instruction on cognitive outcomes: a meta-analysis. *Journal of Research on Computing in Education* , 367.

Liu, X. (2004). Socio-cultural context for online learning: a case study from activity theory perspective. *Association for Educational Communications and Technology*, (p. 8). Chicago, IL.

Lohr, S. (2008, August 17). At school, technology starts to turn a corner. *The New York Times* .

Lowe, J. (2001-2002). Computer-based education: Is it a panacea? *Journal of Research on Technology in Education* , 163-171.

Mann, D., Shakestaft, C., Becker, J., & Kottkamp, R. (1999). *West Vigrinia story: Achievement gains from a statewide comprehensive instructional technology program.* Beverly Hills, CA: Milken Family Foundation.

Martindale, T., Pearson, C., Curda, L. K., & Pilcher, J. (2005). Effects of online instructional application on reading and mathematics standardized test scores. *Journal of research on technology in education* , 349-360.

McCain, T. (2005). *Teaching for tomorrow teaching content and problem-solving skills.* Thousand Oaks, California: Corwin Press.

Means, B., Wagner, M., Haertel, G., & Javitz, H. (n.d.). *Investigating the cumulative impact of educational technology.* Retrieved February 18, 2008, from sri.com: http://www.sri.com/policy/designkt/bmeans3.pdf

Mercer, N. (2008). Talk and the development of reasoning and understanding. *Human Development* , 90-100.

Merriam, S. B. (1998). *Qualitative research and case study applications in education.* San Francisco: Jossey-Bass.

Merriam, S. B. (2002). *Qualitative research in practice: Examples for discussion and analysis.* San Francisco, CA: Jossey-Bass.

Middleton, B. M., & Murray, R. K. (1999). The impact of instructional technology on student academic achievement in reading and mathematics. *International Journal of Instructional Media* , 109.

Miners, Z. (2007, December). Surveys present contradictory findings. *District Administration* , p. 123.

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record* , 1017-1054.

Moll, L. C. (2004). *Vygotsky and education.* New York: Cambridge University Press.

Moll, L. C. & Greenberg, J. B. (2004). Creating zones of possibilities. In L. C. Moll (Ed.), *Vygotsky and Education*. New York: Cambridge University Press.

Morgan, D. (1997). *Focus groups as qualitative research. 2nd edition.* . Thousand Oaks, CA: SAGE.

Munari, A. (1994). Jean Piaget, 1896-1980. Retrieved March 11, 2009 from http://www.ibe.unesco.org/fileadmin/user_upload/archive/publications/ThinkersPdf/piaget.PDF

Nagel, D. (2008, September). *Education technology spending to top $56 billion by 2012.* Retrieved February 26, 2009, from T.H.E. Journal: http://www.thejournal.com/articles/23299

National Commission on Excellence in Education. (1983, April). *A nation at risk.* Retrieved March 13, 2008, from U. S. Department of Education: http://www.ed.gov/pubs/NatAtRisk/risk.html

National Forum on Educational Statistics. (2003). *Suggestions, tools and guidelines for assessing technology in elementary and secondary education.* Retrieved February 22, 2008, from National Center for Educational Statistics: http://nces.ed.gov/pubs2003/tech_schools/

Neubert, S., & Reich, K. (2006). The challenge of pragmatism for constructivism: Some perspectives in the programme of Cologne constructivism. *Journal of Speculative Philosophy* , 165-191.

NewBay Media. (n.d.). *New students, new tools, new possibilities; Creating digital learning environments.* Retrieved February 11, 2008, from Tech Learning: http://newbay.ebookhost.net/tl/hp/1/

Newell, S. (2004). Enhancing cross-project learning. *Engineering Managment Journal* , 12-20.

Newsweek. (2007, October 24). *Practical futurist: Are computers wrecking schools.* Retrieved February 12, 2008, from Newsweek.com: http://www.newsweek.com/id/61613/output/print

North Central Regional Educational Laboratory. (2005). *Critical issue: Using technology to improve student achievement.* Retrieved February 22, 2008, from North Central Regional Educational Laboratory, ncrel.org: http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te800.htm

Offord, L. (n.d.). *The Mozart of psychology* . Retrieved April 17, 2009, from http://vygotsky.afraid.org/#VygotskyPedagogy

O'Hanlon, C. (2009). Resistance is futile. *T.H.E. Journal* , 32-36.

Oppenheimer, T. (2003). *The flickering mind, saving education from the false promise of technology.* New York, New York: Random Hourse.

Oscarsson, M. (2001). Vygotsky: A reawakened star. Retrieved March, 10, 2009 from http://www.marxist.com/science-old/vygotsky_501.html

Owston, R. D., & Wideman, H. H. (2001). Computer access and student achievement in the early school years. *Journal of Computer Assisted Learning* , 433-444.

Palincsar, A. S. (1998). Social constructivism perscpectives on teaching and learning. *Annual Review of Psychology* , 345-375.

Papanastasiou, E., Zembylas, M., & Vrasidas, C. (2005). An examiniation of the PISA database to explore the relationship between computer use and science achievement. *Educational Research and Evaluation* , 529-543.

Papert, S., & Caperton, I. (1991). Constructionism. New York: Ablex.

Papert, S. (1993). *The children's machine, rethinking school in the age of the computer.* New York: Basic Books.

Partnership for 21st Century Skills. (2006, March). *Results that matter, 21st century skills and high school reform.* Retrieved January 30, 2008, from http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=204&Itemid=114

Partnership for 21st Century Skills. (2008). *21st century skills in West Virginia.* Retrieved March 16, 2009, from www.21stcenturyskills.org: http://www.21stcenturyskills.org/documents/p21_wv2008.pdf

Partnership for 21st Century Skills. (n.d.). *Board members.* Retrieved March 13, 2009, from Partnership for 21st Century Skills: http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=508&Itemid=192

Partnership for 21st Century Skills. (n.d.). *Learning for the 21st century.* Retrieved March 13, 2009, from 21stcenturyskills.org: http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Report.pdf

Partnership for 21st Century Skills. (n.d.). *The road to 21st century learning.* Retrieved February 26, 2009, from The Partnership for 21st Century Skills: http://www.21stcenturyskills.org/images/stories/otherdocs/p21up_Policy_Paper.pdf

Pass, S. (2007). When constructivists Jean Piaget and Lev Vygotsky were pedagogical collaborators: a viewpoint from a study of their communications. *Journal of Constructivist Psychology* , 277-288.

Patton, M. Q. (1990). *Qualitative evaluation and research methods (2nd ed.).* Newbury Park, CA: Sage.

Peck, C., Cuban, L., & Kirkpatrick, H. (February, 2002). Techno-promoter dreams, student realities. *Phi Delta Kappan* , 472-480.

Piaget, J., & Inhelder, B. (1958). *The growth of logical thinking from childhood to adolescence.* New York: Basic Books.

Piaget, J. (1970). *Structuralism.* New York: Harper & Row.

Piaget, J. (1978). Success and understanding. Longon: Routledge and Kegan Paul.

Piaget, J. (1980). *Adaptation and intelligence.* London: University of Chicago Press.

Pink, D. H. (2005). *A whole new mind.* New York: Riverhead Books.

Pinker, S. (1997). *How the mind works.* New York: W.W. Norton and Company.

Plowden, M. W. (2003). The relationship between technology and student achievement in selected inner-city schools of one public school system. *ProQuest Dissertaions and Theses-Full Text, 764822231. (UMI No. 3102820).*

Postman, N. (1986). *Amusing ourselves to death.* New York: Penguin Books.

Postman, N. (1992). *Technopoly: the surrender of culture to technology.* New York: Random House.

Postman, N. (1995). *The end of education.* New York: Random House.

Prawat, R. (2001). Dewey and Peirce and the philosopher's philosopher. *Teachers College Record* 103 (4), 667-721.

Public Law 107-110. (2002, January 8). Retrieved from United States Department of Education; http://www.ed.gov/policy/elsec/leg/esea02/107-110.pdf

Punya, M., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record* , 1017-1054.

Ravitch, D. (2009, February 24). *21st century skills: An old familiar song.* Retrieved March 13, 2009, from commoncore.org: http://commoncore.org/pressreleases.php

Reese, J. A. (2005, July). Making a difference one student at a time. *T H E Journal* , pp. 19-20.

Reynolds, D., Treharne, D., & Tripp, H. (2003). ICT-the hopes and the reality. *British Journal of Educational Technology* , 151-167.

Reynolds, R., & Caperton, I. H. (2009). The emergence of six comtemporary learning abilities (6-CLAs) in middle school, high school and community college students as they design web-based games and use project-based social media in globaloria. San Diego, CA: AERA.

Ringstaff, C., & Kelley, L. (2002). *The learning return on our educational technology investment-A review of findings from research 2002.* Retrieved March 30, 2009, from WestEd RTEC: www.wested.org/cs/we/view/rs/619

Roschelle, J. M., Pea, R. D., Hoadley, C. M., Gordin, D. N., & Means, B. N. (n.d.). *Changing how and what children learn in school with computer-based technologies.* Retrieved February 18, 2008, from stanford.edu: http://www.stanford.edu/~roypea/RoyPDF%20folder/Packard2000.pdf

Russell, T. (1997, March/April). *Technology wars.* Retrieved March 30, 2009, from Educause: http://net.educause.edu/apps/er/reviewArticles/32244.html

Russell, T. (1999). *No significant difference phenomenon.* Raliegh, NC: North Carolina State University.

Ryan, R. (2007). The effects of web-based social networks on student achievement and perception of collaboration at the middle school level.

Salopek, J. J. (2003, July). Going native: Cross the generation gap by learning to speak game. *TD* , pp. 17-19.

Salpeter, J. (2003, October 15). *21st century skills: Will our students be prepared?* Retrieved February 11, 2008, from techlearning.com: http://www.techlearning.com/shared/printableArticle.php?articleID=15202090

Sawchuk, S. (2009, March 4). Backers of '21st-century skills' take flak. *Education Week* .

Schacter, J. (1999). *The impact of education technology on student achievement-What the most current research has to say.* Santa Monica, California: Milken Family Foundation.

Schneiderman, M. (2004). What does SBR mean for education technology. *THE Journal* , 30-36.

Selfe, C. (1990). Technology in the English classroom: Computers through the lens of feminist pedagogy. . In C. Handa, *Computers and community: Teaching composition inthe twenty first century* (pp. 118-139). Portsmouth, NH: Boynton/Cook.

Sherry, L., Billig, S., Jesse, D., & Watson-Acosta, D. (2001). Assessing the impact of instructional techology on student achievement. *T.H.E. Journal* , 40-43.

Siegle, D., & Foster, T. (2001). Laptop computers and multimedia and presentation software: Their effects on student achievement in anatomy and physiology. *Journal of Research on Technology in Education* , 29-37.

Society of Rogerian Scholars. (n.d.)The work of Martha E. Rogers. Retrieved March 10, 2009 from http://www.societyofrogerianscholars.org/members_pg2.html

Southwest Educational Development Laboratory. (n.d.). *How can research on the brain inform education?* . Retrieved March 19, 2008, from SEDL-SCIMAST Classroom Compass: http://www.sedl.org/scimath/compass/v03n02/brain.html

Stover, D. (2007, September). The Role of technology. *American School Board Journal* , pp. 29-30.

Strommen, E. &. (n.d.). *Constructivism, technology, and the future of classroom learning.* Retrieved February 18, 2008, from playfulefforts.com: http://www.playfuleffors.com/Archives/Papers/EUS-1992.pdf

Swain, C., & Pearson, T. (2003, Spring). Educators and technology standards: Influencing the digital divide. *Journal of Research on Technology in Education* , pp. 326-335.

Taylor, L., Castro, D., & Walls, R. (2004). Tools, time and strategies for integrating technology across the curriculum. . *Journal of Constructivist Psychology* , 121-136.

Texas Education Agency. (n.d.). *Technology in public education in the United States.* Retrieved February 22, 2008, from Texas Education Agency tea.state.tx.us: http://www.tea.state.tx.us/textbooks/archives/litrevie.htm

The Progress and Freedom Foundation. (1994, August 22). Cyberspace and the American dream: A Magna Carta for the Knowledge Age. Washington, D.C. , United States.

Tseng, K.-H., Chiang, F. K., & Hsu, W.-H. (2008). Interactive processes and learning attitudes in a web-based problem-based learning (PBL) platform. *Computers in Human Behavior* , 940-955.

Tzuo, P. W. (2007). The tension between teacher control and children's freedom in a child-centered classroom: resolving the practical dilemma through a closer look at the related theories. *Early Childhood Education Journal* , 33-39.

U. S. Department of Labor Bureau of Labor Statistics. (n.d.). *Working in the 21st century.* Retrieved March 13, 2009, from bls.gov: http://www.bls.gov/opub/working/

U.S. Department of Commerce. (1999). *21st century skills for 21st century jobs.* Washington, D. C. : U.S. Department of Commerce.

United States Department of Commerce. (2002). *2020 Visions transforming education and training through advanced technology.* Washington, D.C. : United States Deparment of Commerce.

United States Department of Education. (n.d.). *Technology and no child left behind.* Retrieved February 11, 2008, from ed.gov: www.ed.gov/technology

Valdez, G., McNabb, M., Foertsch, M., Anderson, M., Hawkes, M., & Raack, L. (2001, October 2). *Computer-based technology and learning: Evolving uses and expectations.* Retrieved February 22, 2008, from ncrel.org: http://www/mcrel.org/tplan/cbtl/execsum.htm

Vaughn, D. (2004, November/December). Looking ahead. *Knowledge Quest* , pp. 4-5.

Vico, G. (2000). *The new science, 1725.* (D. Marsh, Trans.) New York: Penguin Books.

von Glasersfeld, E. (1984). *An introducation to radiacal constructionism.* Retrieved April 17, 2009, from anti-matters.org: http://anti-matters.org/ojs/index.php/antimatters/article/view/88/81

von Glaserfeld, E. (1990). *An exposition of constructivism: Why some like it radical*. Reston, VA: National Council of Teachers of Mathematics.

Vygotsky, L. S. (1962). *Thought and language.* Cambridge, MA: MIT Press.

Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological process.* Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1981). *The genesis of higher mental functions, in: J. V. Wertsch (Ed.) The concept of activity in soviet psychology.* Armonk, NY: M. E. Sharpe, Inc. .

Vygotsky, L. (1982). *Thought and Language.* Cambridge, MA: MIT Press.

Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russiona and Eastern European Psychology* , 7-97.

Vygotsky, L. S. (2007). In memory of L. S. Vygotsky-letters to students and colleagues. *Journal of Russian and East European Psychology* , 11-60.

Wang, K. H., Wang, T. H., Wang, W. L., & Huang, S. C. (2006). Learning styles and formative assesment strategy: Enhancing student achievement in web-based learning. *Journal of Computer Assisted Learning* , 207-217.

Wang, L. (2007). Sociocultural learning theories and information literacy teaching activities in higher education. *Reference & User Services Quarterly* , 149-158.

Weinberger, D. (2008, January). *Digital natives, immigrants and others.* Retrieved February 11, 2008, from KMWorld.com: http://www.KMworld.com

Wellburn, E. (1996, May). *The status of technology in the education system: A literature review.* Retrieved February 22, 2008, from Community Learning Network, cln.org: http://www.cln.org/lists/nuggets/EdTech_report.html

Wenglinsky, H. (1998). *Does it compute? The relationship between educational technology and student achievement in mathematics.* Princeton, New Jersey: Educational Testing Service.

Wenglinsky, H. (2005/2006, December/January). Technology and achievement the bottom line. *Educational Leadership* , pp. 29-32.

Wertsch, J. V. (1981). *The concept of activity in soviet psychology.* Armonk, NY: M. E. Sharpe Inc.

Wertsch, J. V. (2008). From social interaction to higher psychological processes- a clarification and application of Vygotsky's theory. *Human Development* , 66-79.

West Virginia Board of Education. (1997, March 13). *Policy 5500.03 qualities, proficiencies and leadership skills for principals.* Retrieved February 27, 2009, from West Virginia Department of Education: http://wwwwvde.state.wv.us/policies/p5500.03.html

West Virginia Department of Education. (2005, November 14). *Governor announces national partnership to focus on 21st century skills for students.* Retrieved March 13, 2009, from wvde.state.wv.us: http://wvde.state.wv.us/news/1099/

West Virginia Department of Education. (2008, June). *A chronicle of West Virginia's 21st century learning initiative.* Retrieved March 13, 2009, from wvde.state.wv.us: http://wvde.state.wv.us/dci/documents/ChronologyReportJune2008.pdf

West Virginia Department of Education. (n.d.). West Virginia's framework for 21st century schools school effectiveness. Retrieved February 26, 2009, from West Virginia Department of Education: wvde.k12.wv.us/21stcenturydigitalresources/reflectionsdocs/effectivenesspilar.doc

West Virginia Department of Education. (n.d.). What are 21st century learning skills? Retrieved June 30, 2009 from http://wvde.state.wv.us/global21/pdf/Global21-Skills.pdf

Widmaier, W. W. (2004). Theory as a factor and the theorist as an actor: The "Pragmatist Constructivist" lessons of Johne Dewey and John Kenneth Galbraith. *International Studies Review* , 427-445.

Willingham, D. T. (2009, February 24). *The cognitive science of skills and learning.* Retrieved March 13, 2009, from commoncore.org: http://commoncore.org/pressreleases-3.php

Winner, L. (1997). *Cyberlibertarian myths and the prospects for community.* Retrieved February 11, 2008, from Rensselaer Polytechnic Institute: http://www.rpi.edu/~winner/cyberlib2.html

Wodarz, N. (1994). The effect of computer usage on elementary students' attitudes, motivation and achievement in mathematics. *ProQuest Dissertation and Theses-Full Text, 741429711. (UMI No. 9512915)* .

Wood, D., Bruner, J. & Ross, G. (1976). The role of tutoring in problem solving. Journal of Child Psychology and Psychiatry. 17 (2), 89-100.

World Wide Workshop Foundation. (n.d.). *Globaloria-frequently asked questions.* Retrieved March 17, 2009, from www.worldwideworkshop.org: http://www.myglife.org/worldwideworkshop/pdfs/Globaloria_SIMPLE_FAQ_02-25.pdf

World Wide Workshop Foundation. (n.d.). *WorldWideWorkshop Newsletter, March 2009.* Retrieved April 8, 2009, from worldwideworkshop.org: http://worldwideworkshop.org/newsletter-march-2009

World Wide Workshop Foundation. (n.d.). *Partners.* Retrieved March 17, 2009, from www.worldwideworkshop.org: http://www.worldwideworkshop.org/partners/47

World Wide Workshop Foundation. (2009, May). *World wide workshop selected as AMD foundation grantee: Launching Globaloria in AMD communities.* Retrieved June 10, 2009, from World Wide Workshop: http://www.worldwideworkshop.org/newsletter-may-2009

Yanghee, K., & Baylor, A. L. (2006). A social-cognitive framework for pedagogical agents as learning companions. *ETR&D* , 569-596.

Yin, R. L. (2003). *Case study research design and methods, third edition.* Thousand Oaks, California: Sage Publications, Inc. .

Young, S. B. (2002). *Making technology work for you, a guide for school administrators.* Eugene, OR: International Society for Technology in Education.

APPENDICES

Appendix A- Globaloria Administrator Survey

Globaloria Administrator Survey

Thank you for participating in this confidential survey. The survey is being conducted in order to provide feedback to the World Wide Workshop Foundation's Globaloria: MyGLife project. There are no risks or benefits to you in participating in this survey. Your participation in this survey is entirely voluntary, and you may terminate your participation at any time by discarding the instrument. We do hope, however, that you will take the time to share your perceptions with us. The entire survey should take no more than 5 to 10 minutes.

No one other than the researchers will have access to the data, and all information you provide will be confidential and known only to the researchers. The results of this survey will be reported only in the aggregate; this means that there will be no reporting of your personal responses or participation.

By completing the survey, you affirm that you are at least 18 years of age and are giving your consent to participate in this survey. Thank you for your help in providing this valuable information. If you have any questions about this survey, you may contact the principal investigator, Dr. Barbara Nicholson, at 304-746-2094. If you have concerns about your rights as a research participant, you may contact Dr. Stephen Cooper, Chairman of the Marshall University Institutional Review Board #2, at 304-696-4303.

1. How many students attend your school?

☐ Fewer than 500
☐ 501 – 750
☐ 751 – 1000
☐ More than 1000

2. How many students in your school qualify for free and reduced lunch?

☐ A small number
☐ A moderate number
☐ A large number

3. How long have you been a practicing principal? _____ years

4. How long were you a practicing teacher? _____ years

5. Please respond to the following statements by placing a check in the appropriate box:	**strongly disagree**	**disagree**	**neither agree nor disagree**	**agree**	**strongly agree**
• The goals of the Globaloria program are clear to me.	☐	☐	☐	☐	☐
• The specific objectives of the Globaloria program (i.e., what students are supposed to learn) are clear to me.	☐	☐	☐	☐	☐

• The implementation of the Globaloria program in our location is clear to me.	☐	☐	☐	☐	☐
• Our students have learned valuable 21st Century workplace skills from the Globaloria program.	☐	☐	☐	☐	☐
• Our students have learned skills from the Globaloria program which will allow them to be more successful in their other classes.	☐	☐	☐	☐	☐
• Our participating teachers received adequate training before beginning the Globaloria program.	☐	☐	☐	☐	☐
• Our participating teachers have gained new technology skills through the Globaloria program.	☐	☐	☐	☐	☐
• I would recommend the Globaloria program to others.	☐	☐	☐	☐	☐

Appendix B- Interview Questions for the Globaloria Program

Interview Questions Globaloria Program

1. What role do you believe technology should play in the classroom?

2. What do you understand the objective(s) of Globaloria to be? Are they consistent with your view on the role of technology in the classroom?

3. What do you understand your role to be in the Globaloria: MyGLife program? Did you feel prepared for this role? Did you have any special training to prepare you for your role in the program?

4. Globaloria's academic aspects can be viewed as constructivist in nature – that is, the students are learning skills that they can potentially apply in other scenarios (like collaborative learning, problem-solving, etc.). Do you think that participating in the program can affect the student's academic outcomes in other courses? Attendance? Behavior?

5. Are there benefits to having the Globaloria program in your school? If so, what are they?

6. Are there disadvantages to having the Globaloria program in your school? If so, what are they?

7. Do you plan to continue the Globaloria: MyGLife program in your school? Why? Why not?

a. If yes, do you plan to make any changes in the way the program is delivered in your school?

b. If no, why have you decided to discontinue the program?

8. Do you have any suggestions you would make to change the program before rolling it out to other schools?

Appendix C

Table 3: Bivariate Correlation Between the Principal's Understanding of the Goals of the Globaloria Program and the Principal's Understanding of the Objectives of the Globaloria Program

Subscale	Understanding of Goals	Understanding of Objectives
Understanding of Goals	--	.766**
Understanding of Objectives	.766**	--

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

Table 4: Correlation Coefficient between the Principal's Understanding of the Goals of the Globaloria Program and the Principal's Understanding of the Objectives of the Globaloria Program

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766[a]	.587	.574	.46330

Appendix D

Table 5: Bivariate Correlation between the Principal's Understanding the Goals of the Globaloria Program and the Principal's Years of Teaching Experience of the Principal

Subscale	Understanding of Goals	Years of Teaching
Understanding of Goals	--	-.687**
Years of Teaching	-.687**	--

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

Table 6: Correlation Coefficient between the Principal's Understanding the Goals of the Globaloria Program and the Principal's Years of Teaching Experience of the Principal

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.687[a]	..472	.456	6.91580

Appendix E

Table 7: Bivariate Correlation between the Principal's Understanding of the Goals and the Principal's Understanding the Implementation of the Globaloria Program

Subscale	Understanding of Goals	Implementation
Understanding of Goals	--	.679**
Implementation	.679**	--

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

Table 8: Correlation Coefficient between the Principal's Understanding of the Goals and the Principal's Understanding of the Implementation of the Globaloria Program.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.679[a]	.462	.445	.55048

Appendix F

Table 9: Bivariate Correlation between the Principal's Understanding of the Implementation of the Globaloria Program and the Principal's Perception of Improved Student Grades after the Globaloria Program

Subscale	Implementation	Improved Grades
Implementation	--	.679**
Improved Grades	.679**	--

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

Table 10: Correlation Coefficient between the Principal's Understanding of the Implementation of the Globaloria Program and the Principal's Perception of Improved Student Grades after the Globaloria Program

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.679[a]	.462	.445	.55048

IRB Documentation

MARSHALL UNIVERSITY
www.marshall.edu

Office of Research Integrity
Institutional Review Board
401 11th St., Suite 1300
Huntington, WV 25701

FWA 00002704

IRB1 #00002205
IRB2 #00003206

April 23, 2009

Barbara Nicholson, PhD
Leadership Studies, MUGC

RE: IRBNet ID# 115740-1
At: Marshall University Institutional Review Board #2 (Social/Behavioral)

Dear Dr. Nicholson:

Protocol Title:	[115740-1] Interviews of Principals Involved in the Globaloria MyGLife Technology Initiative	
Expiration Date:	April 22, 2010	
Site Location:	MUGC	
Type of Change:	New Project	APPROVED
Review Type:	Expedited Review	

In accordance with 45CFR46.110(a)(7), the above study and informed consent were granted Expedited approval today by the Marshall University Institutional Review Board #2 (Social/Behavioral) Chair for the period of 12 months. The approval will expire April 22, 2010. A continuing review request for this study must be submitted no later than 30 days prior to the expiration date.

This study is for student William Chapman.

If you have any questions, please contact the Marshall University Institutional Review Board #2 (Social/Behavioral) Coordinator Bruce Day, CIP at (304) 696-4303 or day50@marshall.edu. Please include your study title and reference number in all correspondence with this office.

Marshall University IRB

Approved on:	4/23/09
Expires on:	4/22/10
Study number:	115740

Informed Consent to Participate in a Research Study
Globaloria: MyGLife Leadership Perspectives

Barbara Nicholson, PhD, Principal Investigator

Introduction
You are invited to be in a research study. Research studies are designed to gain scientific knowledge that may help other people in the future. You may or may not receive any benefit from being part of the study. There may also be risks associated with being part of research studies. Your participation is voluntary. Please take your time to make your decision, and ask your research investigator or research staff to explain any words or information that you do not understand.

Why Is This Study Being Done?
The purpose of this study is to analyze the implementation of the Globaloria Project in your school.

How Many People Will Take Part In The Study?
The leaders of the Globaloria Program pilot schools in West Virginia. About 5 people will take part in this study. A total of 12 subjects are the most that would be able to enter the study.

What Is Involved In This Research Study?
You will be asked to participate in a brief interview. Responses to the interviews will be used to identify the perceptions of administrators of the effects of the Globaloria: MyGLife project in their schools. These interviews may be either face-to-face or telephone-based. All interviews will be tape-recorded. ***Verbal consent will be secured for telephone interviews and written consent forms will be secured for face-to-face interviews.***

How Long Will I Be In The Study?
You will be in the study for only the duration of the interview.
You can decide to stop participating at any time. If you decide to stop participating in the study we encourage you to talk to the study investigator or study staff as soon as possible.
The study investigator may stop you from taking part in this study at any time if he/she believes it is in your best interest; if you do not follow the study rules; or if the study is stopped.

What Are The Risks Of The Study?
There are no known risks to those who take part in this study. There may be other side effects that we cannot predict. You should tell the researchers if any of these risks bother or worry you.

Are There Benefits To Taking Part In The Study?
If you agree to take part in this study, there may or may not be direct benefit to you. We hope the information learned from this study will benefit other people in the future. The benefits of participating in this study may be increasing the effectiveness of the Globaloria Program.

What About Confidentiality?
We will do our best to make sure that your personal information is kept confidential. However, we cannot guarantee absolute confidentiality. Federal law says we must keep your study records private. Nevertheless, under unforeseen and rare circumstances, we may be required by law to allow certain agencies to view your records. Those agencies would include the Marshall University IRB, Office of Research Integrity (ORI) and the federal Office of Human Research Protection (OHRP). This is to make sure that we are protecting your rights and your safety. If we publish the information we learn from this study, you will not be identified by name or in any other way. Though we do plan to record your interview, we will destroy the recording after it has been transcribed.

What Are The Costs Of Taking Part In This Study?
There are no costs to you for taking part in this study. All the study costs, including any study tests, supplies and procedures related directly to the study, will be paid for by the study.

Will I Be Paid For Participating?
You will receive no payment or other compensation for taking part in this study.

Who Is Sponsoring This Study?
This study is being sponsored by the Globaloria Program. The sponsor is providing money or other support to help conduct this study. The researchers do not, however, hold a direct financial interest in the sponsor or the product being studied.

What Are My Rights As A Research Study Participant?
Taking part in this study is voluntary. You may choose not to take part or you may leave the study at any time. Refusing to participate or leaving the study will not result in any penalty or loss of benefits to which you are entitled. If you decide to stop participating in the study we encourage you to talk to the investigators or study staff first.

Whom Do I Call If I Have Questions Or Problems?
For questions about the study or in the event of a research-related injury, contact the study investigator, Name at Telephone number (also include after hours number).
For questions about your rights as a research participant, contact the Marshall University IRB#2 Chairman Dr. Stephen Cooper or ORI at (304) 696-7320.

You will be given a copy of this consent form.

Initials _____

SIGNATURES

You agree to take part in this study and confirm that you are 18 years of age or older. You have had a chance to ask questions about being in this study and have those questions answered. By signing this consent form you have not given up any legal rights to which you are entitled.

Subject Name (Printed) _____

Subject Signature _____ Date _____

Person Obtaining Consent (Printed) _____

Person Obtaining Consent Signature _____Date _____

Marshall University IRB	
Approved on:	4/23/09
Expires on:	4/22/10
Study number:	115740

Consent to Participate in Research – Verbal Presentation

Hello, my name is {**William Chapman**}. You have been chosen at random to be in a study about {**the Globaloria-MyGLife program being piloted in your school.**}. This study involves research. The purpose of this research study is to {**gain the perceptions of administrators regarding the Globaloria-MyGLife program**}. This will take {**30 minutes**} of your time.

There are no foreseeable risks or benefits to you for participating in this study. There is no cost or payment to you. If you have questions while taking part, please stop me and ask. You {**will**} remain anonymous.

If you have questions about this research study you may call {**Dr. Barbara Nicholson**} at {**Marshall University Graduate College**} and she will answer your questions. If you feel as if you were not treated well during this study, or have questions concerning your rights as a research participant call the Marshall University Office of Research Integrity (ORI) at (304) 696-4303.

Your participation in this research is voluntary, and you will not be penalized or lose benefits if you refuse to participate or decide to stop. May I continue?

CURRICULUM VITAE

William E. Chapman Jr. wchapman@wirefire.com

334 Peniel Road 304-927-4413

Reedy, West Virginia 25270

EDUCATION

B.A.	Education	Bethany College	1990
M.A.	Elementary Education/Science	Marshall University	1997
M.A.	Leadership Studies	Marshall University	2000
Ed. D.	Leadership Studies	Marshall University	2009

EMPLOYMENT

1990-2000	Teacher	Roane County Schools
2000-2003	Principal	Wirt County Middle School
2003-2004	Principal	Reedy Elementary School
2004-2007	Principal	Spencer Middle School
2005-Present	Adjunct Professor	Salem International University
2007-Present	Principal	Spencer Elementary School

PROFESSIONAL AFFILIATIONS

West Virginia Association of Elementary School Principals

National Association of Elementary School Principals

PROFESSIONAL RECOGNITION

1997 Spencer Middle School Teacher of the Year

1997 & 1999 Arch Coal Golden Apple Achiever Award for Teaching

1998 Roane County Schools Teacher of the Year

2004 Principal of West Virginia School of Excellence

SELECTED CONFERENCE/PAPER PRESENTATIONS

2006. Productive Reform or Pointless Routine? The Effects of Reading First in Rural Districts in Appalachia. Paper presented to the Southern Regional Council on Educational Administration. Jacksonville, FL, November 1-4. With B. Nicholson and L. Hines.

2008. What's My Line? Principals' Viewpoints on a Multi-Site Technology Pilot. Paper presented to the Southern Regional Council on Educational Administration. Charleston, WV, October 23-26. With B. Nicholson.