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The effects of interactive videoconferencing on elementary literacy : collaborative learning environment

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The effects of interactive videoconferencing on elementary literacy : collaborative learning environment

Abstract

The purpose of this literature review is to examine the effectiveness of videoconferencing on elementary students' literacy learning process. Over thirty peer-reviewed journal articles published within the last ten years are critically analyzed and evaluated. The findings suggest that videoconferencing can embrace elementary students' literacy learning by motivating them to learn, engaging them in diverse activities for collaboration, and enhancing their communication skills development and academic achievement, if appropriate and meaningful learning and teaching strategies are adopted. This review also identifies benefits of using videoconferencing for teacher professional development.

THE EFFECTS OF INTERACTIVE VIDEOCONFERENCING ON

ELEMENTARY LITERACY: COLLABORATIVE LEARNING ENVIRONMENT

A Graduate Review

Submitted to the

Division of Instructional Technology

Department of Curriculum and Instruction

In Partial Fulfillment

Of the Requirements for the Degree

Master of Arts

UNIVERSITY OF NORTHERN IOWA

by

Heather A. Klenke

May 1, 2014

This Review by: Heather A. Klenke

Titled: The Effects of Interactive Videoconferencing on Elementary Literacy:

Collaborative Learning Environment

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Abstract

The purpose of this literature review is to examine the effectiveness of videoconferencing on elementary student literacy learning process. Over thirty peer-reviewed journal articles published within the last ten years are critically analyzed and evaluated. The findings suggest that videoconferencing can embrace elementary students' literacy learning by motivating them to learn, engage them in diverse activities for collaboration, and enhance their communication skills development and academic achievement if appropriate and meaningful learning and teaching strategies are adopted. This review also identifies benefits for using videoconferencing for teacher professional development.

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Introduction

Spaceship Earth, the focal point of Epcot Center in Walt Disney World, housed inside a geodesic dome, depicts the advancement of human communication from the origins of prehistoric man to the dawn of communication. In 1994, a remodeled design changed the ending of the ride from a depiction of a computer in a boy's room to a scene of a girl and boy connecting live from America to Asia, in real time, using both audio and video from the Internet (Lange & Yee, 2012). Now, videoconferencing is real-time and held simultaneous. Literacy learning in the 21st Century should go beyond traditional learning. Warlick (2008) explains,

> Being literate in this future will certainly involve the ability to read, write, and do basic math. However, the concept of literacy in the 21st century will be far richer and more comprehensive than the 3 Rs of the one room school house, a legacy that still strongly influences today's education environment. (p. 25)

Videoconferencing in today's schools and classrooms is becoming widespread for global collaboration. Using videoconferencing allows for teachers to bring real world teaching experiences into the classroom of social interaction, collaboration, and literacy learning.

Literacy represents many different parts of a person's environment Barton and Hamilton (2005) define this as:

> Literacy is primarily something people do; it is an activity, located in the space between thought and text. Literacy does not just reside in peoples' heads as a set of skills to be learned, and it does not just reside on paper,

captured as text to be analyzed. Like all human activity, literacy is

essentially social, and is located in the interaction between people. (p. 10)

Technology is evolving. In the past it was the pen and paper, and now it is as

revolutionary as the printing press, we experience much of our world using digital

devices (Warlick, 2008). Interactive videoconferencing can be used to connect one school

to another, regardless of location. This model can extend an existing curriculum and help

act as a medium for incorporating critical thinking, problem solving, communication,

collaboration, independent learning, information media, global and cultural awareness,

and technological literacy (Lawson & Comber, 2010).

This literature review addresses student literacy learning with videoconferencing

in the elementary classroom setting. This research evidence will assist teachers and

administrators in their awareness for establishing literacy programs to enhance classroom

instruction, effective models, and professional development through videoconferencing.

To that end, this review addresses the following questions:

1. What are the effects of videoconferencing on elementary student literacy

    learning?

2. What are effective models for fostering elementary student literacy learning in a

    collaborative videoconferencing environment?

3. What are the effects of implementing videoconferencing on educators in the

    classroom for teaching and learning?

Methodology

The sources were located using *Google Scholar, ERIC (EBSCOhost), and OneSearch* available through the University of Northern Iowa library. The peer-reviewed, published journal articles were sought using the following phrases: *"collaborative learning and interactive videoconferencing;" "interactive videoconferencing and elementary schools;" and "active learning and videoconferencing; communication technology, information communication technology."*

The studies examined literacy using videoconferencing within a collaborative elementary classroom setting. The inclusion criteria of articles, was based on studies, which identified videoconferencing, literacy and collaborative elementary classroom environment. Articles, which did not focus on videoconferencing, literacy and collaborative elementary classroom environment, became the exclusion criteria.

The search included the phases: (a) gather all relevant articles in the initial search and (b) based on the inclusion and exclusion criteria for this literature review, choose articles from the initial search that align with the focus of this literature review. The first phase of the search yielded 10,000 articles. Next, trade journals and magazines were excluded, and only peer-reviewed studies and articles were included. With the remaining articles, the previously identified inclusion and exclusion criteria's were used to finalize which studies and articles would be included in this literature review. A limitation for the article date was placed for the last 10 years. This allowed the search to be within the norm and the process for analyzing scholarly articles could be started. Although some of the studies citied were published 20 years ago because they were relevant to the research collected.

Using the general guidelines for analyzing literature (Galvan, 2009), each source was examined. First, the abstract was skimmed and then the article was read to acquire a general understanding of its content. The scholarly article was then re-read thoroughly with notes taken on it. Fifty scholarly reviewed articles were grouped into three categories based on their areas of studies in videoconferencing that are currently available for classroom instruction. The three categories include the effects of videoconferencing implementation on student literacy learning, the effective models of videoconferencing and the effects of videoconferencing implementation on educators and teaching. Among the 32 articles, 15 studies were critically analyzed in depth.

Analysis and Discussion

This section is organized according to the research findings and discussions of the effects of videoconferencing on student literacy first, effective teaching and learning models for using videoconferencing second. It ends with the research evidence of teacher professional development through using videoconferencing.

Student Literacy and Videoconferencing

In today's classrooms technology can be used to assist students as they learn traditional literacy skills, but with increased use will expand the definition of literacy to include new skills. Being literate today includes not only the ability to read and write but the ability to produce web pages, blogs, collaborate in social networks, and connect through videoconferencing. Providing a real-time collaborative learning environment in the classroom videoconferencing involves encoding text which allows two or more locations to connect using the Internet and enables both locations to see and hear one another (Pringle, Klosterman, Milton-Brkich, & Hayes, 2010). Lankshear and Knobel define literacy as "socially recognized ways of generating, communicating and negotiating meaningful content through the medium of encoded text." (as cited in Larson & Marsh 2005, p.64). Education has used videoconferencing for distance education courses, professional development workshops, virtual meeting with subject matter experts, virtual field trips, and collaborative learning environments between schools (Lawson & Comber, 2010). While videoconferencing has been used for distance education courses, teacher professional development, virtual meetings, with subject experts, and virtual field trips, it is important to know how videoconferencing makes an impact for elementary literacy learning.

As mentioned earlier, literacy is not just reading or writing; it encompasses the skills a person needs from birth (Larson & Marsh 2005). Goodman (2001) argues "children discover and invent literacy as they participate actively in a literate society" (p. 316). This applies to every child since we live in a literate society where reading, writing, and speaking surrounds us all. This includes using evolving technology to enhance literacy through interactions with elementary students in a different setting.

For instance, in a qualitative study, Larson and Marsh (2005) examined two elementary urban classrooms on using videoconferencing in New York City where the teachers use digital tools with students on a daily basis to enhance literacy components such as electronic texts as blogging, instant messaging, and videoconferencing. Classrooms participating in a videoconferencing session in second grade learn both formal and informal context of a connected classroom. In addition, examples of how videoconferencing is being integrated into elementary literacy are being shared.

In a study, as cited in Larson and Marsh (2005), Lynn Gatto, a second grade teacher from Rochester, New York, uses videoconferencing to communicate with a classroom in Kentucky. Within Gatto's classroom, literacy practices are authentic and related to everyday life. Each year she designs a culminating thematic unit where students email, videoconference, and take virtual field trips to places before actually taking the road trip. These types of communication skills allow for broadening the students learning experience in the classroom through using videoconferencing. Through a collaborative learning environment in Gatto's classroom the students are able to learn from anywhere on the topics they are studying.

Similar to Gatto's classroom, Hilary Malden (as cited in Larson & Marsh, 2005) uses videoconferencing to further her second graders' literacy in Sheffield, England. Malden connects her classroom to another class and collaborates from a distance to enhance their written work. The students created written pieces of literature work using email and videoconferencing to communicate with students from a distance. Combining pieces of technology to enhance literacy learning within the classroom allows for collaboration and creativity from both the student and distant learner. According to Larson and Marsh (2005), "students become competent in using digital technologies from a very young age and the lack of attention by educators to this experience creates dissonance between home and school experiences" (p. 70). The researchers describe another collaborative project with using technology in Hilary Malden's classroom. Within a collaborative classroom environment Malden had her students participate in digital media presentation. When participating in this project Malden's students were able to use a variety of technology resources to present and share information. Larson and Marsh (2005) found in the classroom examples from Gatto and Malden that videoconferencing had the positive effects on communication and literacy between two groups of students in different locations.

Similarly, Moxley, Reffitt and Miller's study (2010) found that when engaging in virtual literature circles through videoconferencing, students enjoyed the socialization, which was possible in this activity. The researchers were advocates for virtual literature circles through videoconferencing in all classrooms as a method used to get students connected and actively responding to literature, they introduced virtual literature circles to teachers in varying grades and taught them how to implement it appropriately in their

classroom setting and then interviewed the students to get their reactions to the virtual literature circle approach through videoconferencing versus their old traditional method of basal reading.

In a two-year study investigating the students' thoughts about experiences using videoconferencing in virtual literature circles, Certo et al. (2010) randomly selected 24 students in grades 1, 3, 4 and 5 to complete the interview process. The teachers at one school were given workshops on how to conduct virtual literature circles and all materials were provided for them. Researchers would come into the classroom to ensure that the virtual literature circles through videoconferencing were being conducted correctly. Data was collected through individual interviews with students involved in the virtual literature circles. Each of the twenty-four children were asked to respond to the same six questions, focusing on students' attitudes towards virtual literature circles through videoconferencing and their thoughts on what they learned during literature circle time.

The researchers found that 23 of the 24 students preferred virtual literature circles compared to their previous instruction of reading (mainly basal). The students all stated that they were excited about collaborating with other students to read real books, and not parts or chapters like in a basal. Other benefits stated included making new friends and engaging in discussion with students about books. A major point that the older students made was that virtual literature circles encouraged them to read more. They were excited about talking about what they read. They felt not only did it positively impact their social interaction abilities; it also helped their writing (Certo et al., 2010).

The results from the work of Certo et al. (2010) are also supported by a study conducted by Bowers-Campbell (2011), which found that students understood the

literature books, enjoyed reading more and performed better on reading comprehension assessments as a result of participating in virtual literature circles through the reflective activity of videoconferencing. When students re-read transcripts of posts to discuss the quality of their discussions, they are engaged in active learning while they are making adjustments for their next meeting. In addition, the teacher-moderator of on-line literature circles is involved in every forum. Simultaneously, teachers help to further engage the students in higher-level thinking as well as analyze any improvements that need to be made in instruction.

Effective Models

After discussing the positive effects of using videoconferencing within the elementary literacy as explored above, it is important to identify and analyze the effective and innovative learning and instructional models that engage elementary students in active learning at different classroom locations. Innovations can be seen as a variation on the teaching and learning environment using an effective model (McKinney, 2000). As Greenberg (2004) points out, "instructional strategies must be matched to the technology" (p. 6). The length of scheduled videoconferencing sessions needs to be monitored. When Greenberg (2004) was studying the length of videoconferencing sessions, the optimal length was between 15 to 25 minutes. Beyond that length, the student interest decreased.

Active learning strategies. As mentioned above, videoconferencing must be integrated with appropriate and meaningful teaching and learning strategies. Active learning and teaching strategies need to be employed to increase the learners' motivation and see what is applicable in the real world setting. Different types of active learning strategies can be achieved through using online multi-media, chatting, videoconferencing,

file attachments, simulation software, and role-playing. In a comprehensive review of active learning strategies, Prince (2004) identified the essential skills used in active learning: active listening; thoughtful speaking, reading of content material, and reflection and writing for what is being read and learned.

Although Szente's research (2003) was conducted more than 10 years ago, it is included in this review because it provides an interesting insight for international collaboration when students engaged in active listening and thoughtful speaking. The participants of the study were four 3rd graders and four 4th graders studying Spanish in The King Center Charter School in Buffalo, NY and eight 3rd-grade ESL in The Lincoln School in San Jose, Costa Rica. The students in each site had specific questions to ask one another. For formulating their list of questions, each group sent questions by email to the participating teachers' corresponding countries. Upon evaluating each group and the main instructional goal, project administrators developed session objectives. These included establishing videoconferencing sessions among the students, and allowing the students to research using various digital tools, develop a presentation, practice presentation skills, and experiment with the technology. An outline for each practice session indicated which activity students needed to be engaged in to accomplish the session objectives. Students began the conference with individual introductions for one another, then they made presentations from both locations, and ended with informal conversations. During the evaluation stage, students were well prepared for their videoconferencing presentations with their distant learning school, were engaged in the learning process and had a high number of student interaction among the locations.

Technology-rich learning environments such as global projects have been shown to positively contribute to student success in school (Hancock & Betts, 2002).

Project-based learning. Project-based learning (PBL) is another learning strategy for effective models in a collaborative learning environment by using videoconferencing. A project-based learning environment can be described as: a group of students working together to create a project and meet clear learning objectives throughout the process. With advances in online communication tools, new technology is expanding to meet the needs of online communities for a collaborative learning environment (Suh, 2011). Constructivist approaches to learning are encouraged when videoconferencing is used as a mind tool to support critical and creative thinking (Jonassen, 2000). PBL provides a greater understanding of a topic with critical thinking skills and increases motivation to learn (Bell, 2010), perhaps because PBL has been shown to be adaptive to various student learning styles and multiple intelligences (Thomas, 2000).

There are numerous project reports about the benefits of project-based learning (PBL). These reports involve allowing students to explore real problems, working in collaborative groups to develop cross-curriculum skills, engaging students in active learning and becoming more motivated when linked with real world issues (Edutopia, 2012).

In a research project about the effect of project-based learning on learning outcomes in the 5th grade social studies course in primary education, Gultekin (2005) used the mixed methods to examine the effect of project-based instruction by using videoconference on learning outcomes for 5th grade social studies students. Thirty-five

students in each classroom with a total of 70 in two classes participated in the study. The researchers examined the following questions to guide their study 1) is there a difference between the project-based learning approach and 2) the control group in which the students are learning in the conventional teaching approach. In the quantitative phase, a pre- and post- test control group design was collected to measure the effects of project-based learning on the learners' success. In the qualitative phase, a semi-structured interview was used to learn the opinions of learners and teachers involved in the study. The results showed that there was a significant correlation between the academic success of project-based learning and control groups. In addition, participants and teachers indicated that project-based learning increased the success by providing students with various skills and making learning meaningful.

Anastasiades, Filippousis, Karvunis, Siakas, Tomazinakis, Giza, and Mastoraki, (2009) conducted a qualitative study of 46 students in fourth grade in two elementary schools in Athens and Crete, Greece. The two schools designed a cross-curricular activity to be implemented for a distant collaborative learning environment. The objective for this collaborative learning environment was to raise awareness of students on environmental issues, and climatic changes of the planet. It was hypothesized that through researching, students can develop critical and creative thinking skills.

Students in both locations were divided into groups. Each group was composed of students from each location. Students collaborated at a distance through videoconferencing and, using script writing; created their own audio-visual material using an animation technique. Students collaborated further and developed their idea into a synopsis, which illustrated the script, designed a flipbook, and then also prepared a

presentation. Videoconferencing under such an educational setting plays a significant role in supporting collaborative synchronous learning activities at a distance by strengthening relationships among students and teachers of the local and remote classrooms at both schools. This research indicated that increased academic performance, motivation, collaborative learning, and engagement in the learning process by using videoconferencing.

Another videoconferencing project between two schools in different districts of Hong Kong gave students the opportunity to study water channels near each of their schools. A primary school from Wong Tai Sin and a secondary school in Malaysia were selected to collaborate and communicate testing different types of water samples. The bad smell of both the channels concerned students regarding the impact of pollutants on the health of the communities. Three videoconferencing sessions were scheduled for the students to discuss questions, collect data, report findings, and discuss solutions. Both schools learned from each other through knowledge construction on water quality and acquired presentation and social skills. Teachers concluded that collaborative PBL projects and using videoconferencing enhanced the student-learning experiences within the classroom (Fung & Chan, 2009).

Expert panel. Using an expert panel is another model for consultation using specialists which may also be conducted via videoconferencing. These specialists are located at different educational locations. In a "live" conference the expert panel members answer questions from students on a case-by-case basis. There is research evidence about using videoconferencing to connect with prominent authors also promote a high level of motivation, which in turn helps students learn. For example, Micklos

(2012) describes how Colby Sharp, a 4th-grade teacher, noticed that talking to authors attracted students to books. Micklos describes how some instructors are taking advantage of a program called *Authors Who Skype*, which allows children to interact with a book author and may motivate them to read books written by the author. Kate Messner, a book author, created this program in 2009. Messner wanted to find a way for schools to afford in-person author visits and discovered that the Skype website could be used for this purpose to organize free 20 minute visits to classrooms. Sharp reported that utilizing the Skye service for videoconferencing an author motivated fourth grade students to interact with the author and excel in reading more challenging books.

Interactive lectures. Utilizing interactive lectures as an effective model, an educator prepares and delivers the same session simultaneously using videoconferencing to different locations on the same day. In each videoconferencing session there is a question and answer section posed by the teacher and student. Course material for interactive lectures is supported by print, video, and online sources.

Two Northern Ireland schools undertook a Virtual Day experiment in 2007. Students from both schools K-12th accessed learning from home. Teachers had interactive lectures with the students using videoconferencing on the Northern Ireland online managed learning environment for that day. This interactive videoconferencing lecture enabled students to take part in classes being held at each school and to have brief tutorials with teachers. It was also used for collaborative work between the two schools. This experiment demonstrated that using videoconferencing could be used as away from actual learning on site (Martin, 2009).

Small group. Finally, another effective model for integrating videoconferencing is utilizing small groups, which can be assigned to students at separate sites within the content of a lesson. Group presentations allow the students to take turns presenting the content through videoconferencing. Small group presentations are enhanced by contributions from the teacher and followed by interactive discussion from all the participants (Martin, 2009).

In addition to using videoconferencing to enhance students' learning in the regular classrooms with two schools, using videoconferencing also benefits students of special needs. Martin (2009) conducted a project, which involved two schools for students with severe learning difficulties (SLD). These schools, located in different parts of Northern Ireland, set out to explore the potential of videoconferencing, to support effective distant collaborative learning in the SLD environment. The project was on the theme of "My Town." The aim was to give students, whose experience of the outside world were necessarily limited, a sense of their own and other places. Students were placed in small groups and each group communicated once a week by videoconferencing. The teachers used the technology as a virtual staff room where they met regularly for discussion. Teacher enthusiasm for this technology, their willingness to change their pedagogy to exploit its potential, and their commitment to student scaffolding both before and during the lessons were key success factors. The outcomes were very encouraging. Videoconferencing was experienced as being inclusive of all the children, including those with little or no oral skills who used body language to communicate, or who had their more articulate peers interpret for them. Videoconferencing increased their motivation and improved their concentration. Students with serious behavioral difficulties remained

totally attentive and engaged throughout the 30-minute sessions. It brought a new way of learning to the classroom. It awakened their curiosity about their distant peers and the distant town. This happened subsequently on two very happy occasions, with each school hosting the visit of the other (Martin, 2009).

Videoconferencing can enhance learning interactions within small groups (Burke, Beach & Isman, 1997). "As education and organizations become more global, the ability to work with diverse cultures is increasingly important (Wankel, Marovich & Stanaityte, 2010, p. 39)." When planning for a collaborative learning environment experience for the students, educators must remember to balance the stimulus to keep the students engaged (Hill, 2010). The focus remains on the educational value within the classroom to support the teaching and learning environment (Birden & Page, 2005).

Educators and Videoconferencing

Videoconferencing has been used in numerous educational settings for educator professional development. There are benefits for incorporating technology into educators' everyday instruction while on the other hand it also revealed why educators find it difficult to incorporate videoconferencing into their everyday classroom instruction. It is consistent with the literature on literacy in the classroom and effective models used within an educational setting. Romiszowski's study (2004) examined how both synchronous and asynchronous communication through videoconferencing could provide modes of professional development. Through learning activities and individual learning the factors include but are not limited to:

- Providing training and support for teachers and other support personnel

- Having a vision with clear leadership to provide significant advantages for all educators

- Streamlining of operation for educators

- Providing clear expectation for learning within a classroom

- Engaging learners through online videoconferencing in an effective manner between educator and student

- Providing instructional designs that play a key role into the learning activities and teaching styles

Professional development. A project study, LearnCanada, evaluated using broadband videoconferencing for professional development (Barfurth, 2002). The goal of this study was to learn from the educators about their practices and experiences for effective use of videoconferencing for professional development. Educators for this study were selected from provinces of four different locations (Newfoundland, Quebec, Ontario, Alberta) to participate in the LearnCanada study. Following the study the educators were asked to complete a questionnaire to which 21 out of 23 educators replied. In response to the question on how the study affected their daily teaching methods, two-thirds of the educators in the LearnCanada's study found that this project significantly impacted their daily teaching methods. However, one-third of the educators had a "no" response on how this study had impacted their teaching methods. This study found that two-thirds of the participants felt positive about using videoconferencing for professional development because they could enhance teaching methods within their classroom. Following this study researchers concluded in order to have successful sessions educators need to

consider issues such as time, scheduling, and other barriers when using videoconferencing.

LearnCanada was not the only project study in Canada; there were several other research projects conducted. For instance, Wideman (2004) evaluated the Advanced Broadband Enabled Learning Project (ABEL): a large-scale federally funded Canadian videoconferencing project. The ABEL project examined whether using broadband technology in Canadian schools could transform educator professional development, and it would eventually improve student success. Educators from two different provinces (Alberta and Ontario) were selected to access videoconferencing hardware, software, and support. In the study educators' professional growth was measured in two main areas: level of technology skill, and changing their teaching and pedagogy methods. Educators reported that their students had positive student-centered and collaborative learning experiences as a result of their own involvement in using videoconferencing for professional development. Students also reported a positive learning experience when they could view and communicate with the students in other region. Through using videoconferencing for educators, it proved to be an enhancement to the curriculum and showed increased engagement for the students quality learning. As students were surveyed since conducting this study they have seen significant positive outcomes with a collaborative environment to engage students and teachers professional growth within the classroom.

To further the research on using videoconferencing to deliver teachers' professional development, Kiriakidis (2010) conducted a qualitative study on using videoconferencing as an educational tool to connect the educators' increased level of self-

efficacy with their students' performance in testing. Over a period of six months 16 teachers met via Skype weekly to share instructional expertise, ideas, and opinions for the purpose of supporting each other online. The findings revealed a) students benefited when educators' effectiveness increases, b) educators have the ability to work more efficiently with students when they have a higher sense of self-efficacy, and c) educators with a higher sense of self-efficacy can increase the level of their students' motivation.

Additionally, there is an attempt to further the teacher professional development by creating a partnership between the in-service teachers in school districts and the university pre-service teachers. When a partnership is built through videoconferencing between a school district and university, it has the benefits for both inservice and preservice teachers in a collaborative learning environment.

For instance, in a classic study about the partnership between a university and a school district, Cifuentes, Stephen and Reynolds (1997) studied traditional two-way interactive videoconferencing between the partners and evaluated the instructional environment. They wanted to define important elements in successful videoconferencing partnerships. The participating schools were Texas A&M University and rural towns of Somerville and Waller, TX. This study involved 141 preservice participants and eleven public school teachers. Over the course of two semesters, both quantitative and qualitative data was collected. The researchers identified which items to consider important when forming partnerships between universities and rural schools:

- Set personal goals for collaborating through the videoconferenced partnership.

- Allow students to pursue topics/subject within a classroom that interest them.

- Assure that all students and faculty benefit through using videoconferencing.

- Provide a time for reflection on the process of videoconferencing within a classroom.

- Have clear expectations and roles for stakeholders within the partnership (p. 74).

A similar study conducted by Lehman and Richardson (2003) looks at how forming partnerships between universities and public schools provide a diverse learning experience for pre-service teachers through using technology. Through using web-based videoconferencing programs in the university, pre-service teachers are broadening their knowledge with experienced technology literate schools in the classroom. This study was part of a project called *Preparing Tomorrow's Teachers to use Technology (PT3)*. The study looked at several ways to make connections with videoconferencing for both faculty members/pre-service teachers and K-12 classroom activities such as: a) short-term classes for observation, and b) longer-term classes to interact with teaching lessons with the classroom teacher.

When a professor used video conferencing in her pre-service education course to observe her student teachers teach, he/she was able to comment on her students' learning experience through this system. The teachers were interviewed about the process to see if there were limitations in their classrooms when using videoconferencing for collaborating with a university student. The limitations cited by the pre-service teachers fell into two basic areas, technical problems of the equipment and not being present in the classroom. The overall research with using videoconferencing technology in the classroom was a positive experience for the teachers. This study indicated that technology-enabled field

experiences could enhance university pre-service teacher programs from learning through experienced teachers. Meanwhile, the practicing teachers made connections to partner with university programs to assist future pre-service teachers in developing their teaching and pedagogy for in the classroom (Lehman & Richardson, 2003).

Videoconferencing offers both asynchronous and synchronous technology to provide educators with new opportunities to access information, experience new things, and connect to different places, all over the world. Videoconferencing offers educators' real-time access and real-world problem solving for professional growth within their curriculum. In a large scale study about 27 schools Mountain (2008) examined using ~~the use of~~ videoconferencing in the K-12 classroom as a valuable resource for bringing individualized instruction and external programs to enhance the learning environment. The findings suggest that there are several advantages for using videoconferencing for professional growth to enhance curriculum instruction such as: have external experts, have collaboration between classes, have guest speakers, have virtual experiences, have integration of different media and have resources into the classroom. Equally important, this model of professional development allows educators to discuss, document share, and to work collaboratively on common issues within their classroom. Interactive videoconferencing for professional development encourages educators to be active rather than passively involved in the learning process.

Mountain (2008) also reviewed barriers associated with providing professional development to educators through videoconferencing. Within the same research study he conducted a survey of questions and found that educators participating in professional development through videoconferencing need to have technology skills. The results

showed that educators who seek professional development through videoconferencing need to know how to: use different videoconferencing software to make connections for professional development, learn how to work and maneuver a remote camera, adjust the microphone sound if needed, and troubleshoot issues if a loss in connection occurs.

Mountain (2008) found a trend moving away from the one-day professional development sessions and providing richer, long-term sessions to include follow-up support. As a result, Mountain predicted that in the future we will see educators receiving higher quality of professional development to support them in integrating different practices into their teaching. As educators obtain more professional development to increase their technology skills in the classroom, they will be exploring new methods of receiving professional development that goes beyond the traditional classroom. Educators will come to realize that by using videoconferencing as a means to receive professional development, they have the opportunity to connect with instructors all over the country and the world. When educators are not limited by distance, time, or place for their professional development, their attitudes on learning will be a more positive one where they are seeking out knowledge and experience in the areas of specific interest to them and their teaching.

Conclusions and Recommendations

Videoconferencing can be used as a collaboration tool to involve critical thinking and problem-solving skills among students who partner with schools to learn through creative, relevant curriculum projects. Using effective teaching models, teachers can take existing curriculum, develop project guidelines, set learning objectives and timelines to interact with a classroom in a distant location.

The first area of study examined the effects of videoconferencing in elementary literacy learning. The outcome of the research helped to further engage the students in higher-level thinking as well as analyze improvements that needed to be made in instruction. There are many different forms of literacy that teachers need to incorporate into their instruction, and technology to have a positive impact utilizing videoconferencing. Literacy is not only reading, writing, and listening and speaking; it is many other things as well as technology and how we navigate through it. Students may be expected to use technology to reach out and connect with students in other classrooms using blogging, skyping, and emailing. To best prepare students for this type of connected learning, research showed videoconferencing can benefit the students' learning (Larsh & Marsh, 2005; Certo, et al., 2010; Bowers-Campbell, 2011).

The second area of study examined effective models used by educators to enhance learning through using videoconferencing. There are similarities and differences in researching effective models for interactive strategies to assist educators in keeping learners at far-end sites engaged. But one thing is certain, and the research evidence supports that elementary student literary learning can be enhanced by project-based learning (Suh, 2011; Thomas, 2000; Anastasiades et al. 2009), active learning strategies

(Prince, 2004; Szente, 2003; Hancock & Betts, 2002), expert panels (Micklos, 2012), interactive lectures (Martin, 2009), and small groups (Martin, 2009; Burke, Beach & Ishman, 1997; Wankel, Marovich & Stanaityte, 2010; Hill, 2010; Birden & Page, 2005). . Using videoconferencing in the classroom can transform students who normally are not motivated learners into motivated learners. Many students have different learning styles and fortunately videoconferencing can incorporate many of those learning styles when effective teaching models are applied. Utilizing videoconferencing in the classroom can be visual, interactive and informational, which can benefit a broad range of learning styles. By using these effective teaching models, students are becoming more involved in their learning and enjoying what they are learning about within a connected classroom (Edutopia, 2012; Anastasiades et al., 2009; Micklos, 2012; Martin, 2009).

The third area of study was to determine the effect of videoconferencing implantation. This literature review showed studies that portrayed student motivation increases when technology is used meaningfully within the classroom. This requires teachers to become more familiar with using technology in the classroom so that the benefits of videoconferencing can be used. Educators and videoconferencing research show that teachers who utilize professional development to increase their technology and collaborate with other educators are more likely to provide the opportunities for their students to use various types of technologies (Cifuentes, Stephen and Reynolds, 1997; Barfurth, 2002; Kiriakids, 2010; Lehman and Richardson, 2003; Mountain, 2008: Romiszowski, 2004; Wideman, 2004).

Videoconferencing is valuable to students learning in the classroom. When videoconferencing is used in the classroom, teachers are providing opportunities for their

students to increase their knowledge and collaborate with connected learners. Videoconferencing enhances students learning by motivating students to learn and engage them in diverse activities that integrate different learning styles using effect-teaching styles. Teachers should also increase their level of professional development in the classroom to advance student learning and provide the necessary skills to enhance student learning.

Recommendations

It is highly recommended that future studies continue to research how videoconferencing might enhance the educational classroom. For teachers to effectively adopt videoconferencing in the elementary teaching classroom the following factors need to be monitored: the number of students enrolled in their classroom, the physical location of the students', and effective teaching models. This needs to be monitored to maintain the students' quality of learning through a videoconferencing session. Secondly, administrators need to be adaptable and acceptable to the constant change in teaching methods to enhance the students' quality of learning. Without the adaptations students will lose interest in learning and not compete both locally and globally through using videoconferencing. In addition, teachers need to collaborate with their administrator to further their professional development both in and out of school.

In conclusion, educators should continue to seek the best methods to integrate 21st Century skills into the curriculum; global projects provide one path to meet this objective. Technology provides new ways to communicate and collaborate to cross-global boundaries. Teamwork and collaboration help prepare students to interact socially while cultural diversity can be fostered between a rural and urban school, a private and

public school, or a U.S. and Asian school. It is possible through videoconferencing and global projects to enhance student learning and bring the world to the classroom for all age levels.

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