

Meeting the Challenges of Deaf Education Teacher Preparation: Innovative Practices in Online Learning

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Abstract

Bond (2000) and Scheetz and Martin (2008) identified characteristics of effective teachers, and qualities of master teachers of the deaf. Combining those characteristics and qualities into a single teacher of the deaf training program allows for the creation of effective teachers of the deaf. Methods for applying the characteristics into teacher training courses in an online format are detailed. Included are suggestions for promoting effective learning strategies in online environments. By combining effective pedagogy and innovative technology, online learning can clearly be an effective tool for the delivery of teacher of the deaf training content.

Keywords: distance education, Web-based training, Internet, hearing impaired, technology training, educator, special education

Introduction

In the two decades since the advent of the World Wide Web (WWW), online learning has rapidly become an integral component of the college experience. Teacher of the deaf preparation programs have followed suit in their use of the Internet in training pre-service teachers. Web-based classrooms create an accessible and unique environment in which to train teachers of the deaf. This article describes innovative practices implemented in one online program.

Important Factors in Training Teachers of the Deaf

Sheetz and Martin (2008) explored the question of whether teacher of the deaf preparation programs were preparing pre-service teachers to possess the qualities of master teachers. They identified six characteristics of master teachers of the deaf, and a variety of practices used by teacher preparation programs to teach students to become master teachers. The following six characteristics were identified as describing master teachers of the deaf:

- Employing cognitive strategies
- Being up-to-date
- Having a passion for teaching
- Working collaboratively
- Demonstrating strong communication skills and
- Creating independent learners

Bond (2000) identified 13 characteristics of effective teachers. The thirteen characteristics focus on four central themes: teaching, planning, attitude, and assessment. Those characteristics center on the following four areas:

- **Teaching:** included using content knowledge, using deep representations, making use of problem solving skills, and using improvisations.

- **Planning** included setting up optimal classroom environments, providing high expectations for students, and imparting sensitivity to context.
- **Attitude:** included promoting inquiry and problem solving skills, having a passion for teaching, and showing respect for students.
- **Assessment:** included employing multidimensional perception, monitoring progress and supplying feedback, and testing hypotheses.

While Bond identified these characteristics for general educators, the same characteristics can be applied to effective teachers of the deaf.

Rittenhouse (2004), in a study evaluating newly trained teachers of the deaf, found that while they were typically energetic and willing to attempt to tackle new ideas, they often lacked the skills necessary for the successful maintenance and development of individual education plans (IEPs). He also suggested that improvement of preparation programs for teachers of the deaf could be focused in the following areas: 1) improving the sign language skills of pre-service teachers of the deaf; 2) improving subject matter knowledge instead of focusing solely on language and communication; and 3) improving the English writing skills of *both* hearing and deaf pre-service teachers of the deaf.

The roles of teachers of the deaf today are changing rapidly, as are the classroom settings and demographics of the students in schools. Teacher of the deaf preparation programs in years gone by trained teachers primarily for one of two classroom settings: residential school placements or self-contained classrooms in public schools. However, the demographics of the children in programs for the deaf have changed significantly. Demographics, coupled with the advances of modern technologies such as the cochlear implants, have prompted increasing numbers of students 1) to be served itinerantly, in rural or urban home districts; 2) to come from non-English speaking homes (Bowen, 2000); 3) to receive assistive technologies such as digital hearing aids and cochlear implants at a younger age; and 4) to function as hard of hearing individuals. Teacher preparation programs must adapt to meet the changing needs of education of the deaf (Mitchell & Karchmer, 2006).

As the demand for teachers of the deaf grows, teacher preparation programs have found students less willing or unable to leave jobs, and uproot families to pursue a teaching degree and certification. Students who choose online or distance education programs often do so because of the convenience it affords (Schrum, Burbank & Capps, 2007). Such students in large numbers are gravitating to programs offered online.

Online learning continues to make important inroads in developing coursework that unites teacher pedagogy theory and policy with field practice (Schrum, Burbank & Capps, 2007). The purpose of this article is to address the use of innovative practices in an online teacher preparation program. The integration of Bond's (2000) qualities of effective teachers within the characteristics of master teachers of the deaf posed by Sheetz and Martin (2008) form the framework of the program. This article also seeks to address the misconception that online learning does not adequately prepare teachers of the deaf. Currently, there are six programs in the United States which are delivering degree programs online for those interested in becoming teachers of the deaf (DeafEd.net, n.d.).

Program Overview

The deaf education teacher preparation program discussed in this article is an established program offered at a state-supported university in Texas. Created in 1950, it is the state's oldest teacher of the deaf training program. In 2000, it became evident that the existing program was becoming rather static with enrollment ranging between 5 and 10 students per year. The demands for more teachers of the deaf, and the university's demands for an increase in enrollment strongly indicated that changes in program design were warranted. There were also students who wanted to secure deaf education certification who lived in areas where access to training programs was limited. Johnson (2004) reported that 13 states and several U.S. territories do not offer deaf education teacher preparation programs. He suggested that the time to implement Web-based technologies into deaf education was at hand. The shortage of well-prepared teachers of the deaf needed to be addressed. An online teacher of the deaf preparation program was instituted to address this need. Students can now pursue a master's degree and/or teacher certification over four to eight semesters, depending on their previous background, experiences and degrees. To date the program has served students in 19 states across the nation, Canada, and Europe. The program graduated 20 teacher pre-service teachers in the spring 2009 semester.

Creating an online teacher preparation program required planning and forethought to ensure accessibility to students with hearing loss. During early years accessibility features were limited, using paper and electronic transcriptions of teaching videos. As technology improved, the program incorporated software, such as *Camtasia*, that allows users to create captioned videos of course presentations. Other options investigated included *Accordent* technology and *Adobe Visual Communicator*. While the program initially focused on asynchronous learning, as investigations continued, synchronous learning tools with the ability to use video and sign soon became a viable option. Previous attempts at creating accessible learning tools focused on printed English texts. *Wimba*® and *Illuminate*® both provide synchronous learning environments allowing users to present multimedia content, video, audio, and text-based communication. Unlike previous attempts at creating accessible media which required deaf and hard of hearing students to read printed English, *Wimba* allowed faculty and students to communicate via sign language and speech in live time. For those students whose native language is American Sign Language, *Wimba* offered an accessible tool. Other web-based tools that allow hearing and deaf individuals to interact in accessible environments used by program faculty and students include *GoogleTalk* and *Oovoo*.

Four full-time, tenure-track deaf education faculty members, in addition to two faculty members with multiple degrees in deaf education, audiology, and/or speech pathology, offer students a wide range of courses. Courses are offered via *Blackboard*® and *Wimba*® as the asynchronous and synchronous online course management systems designed to meet the challenges of today's deaf educators. The Texas Teacher of the deaf standards and the Council on the Education of the Deaf Standards are addressed in course work throughout the program. Consistent with recommendations within the field (Johnson, 2004; Easterbrooks, 1999), students are strongly encouraged to take additional educational courses in order to be eligible for regular education certification. With the exception of sign language course work, and student teaching, all coursework is online. Students are required to take nine semester credit hours of sign instruction at their home location at a community college or other institution of higher education and in some way demonstrate proficiency in sign ability. The university's online sign language competency exam is based on the state's teacher sign competency exam. The format of the exam is discussed later in this publication.

Teaching content is delivered through online lectures via PowerPoint, synchronous and asynchronous discussions, online tests, teaching projects, and electronic tools such as wikis, blogs, and podcasts. For students whose communication preferences include sign language, new technology allows for online lectures employing systems such as *Camtasia*® and *Wimba*®. Students create PowerPoint presentations and model teaching videos, and post their case studies on wikis. The university developed a working relationship with Spectrum-K12 School Solutions, which markets *ENCORE*®, an online special education management system to teach the IEP process and its construction. The partnership between the university and Spectrum K12 School Solutions was designed to teach future teachers how to develop individualized educational plans (IEP) and to understand the IEP process, skills that Rittenhouse (2004) identified as lacking in new teachers. The online sign language exam and the use of *Camtasia*® and *Wimba*® to allow sign language communication are examples of addressing the need for proficiency in sign language identified by Rittenhouse (2004).

Characteristics of Effective Teachers of the Deaf

Sheetz and Martin (2008) form the framework of the endeavor in the university's distance education program. Bond's (2000) thirteen characteristics were integrated within the six traits of master teachers of the deaf provided by Sheetz and Martin (2008). The individual elements of Bond's (2000) characteristics are summarized in italics below. The current teacher-preparation program practices are delineated as they relate to the following six characteristics of master teachers of the deaf: employing cognitive strategies, being up-to-date, having a passion for teaching, being collaborative, having strong communication skills, and helping students become independent learners. Innovative technologies that enhance the teaching and learning experiences are discussed in each section.

Trait #1: Employing Cognitive Strategies

Bond (2000) identified having high expectations, deep representations, knowledge of content, and testing of hypothesis as characteristics of effective teachers. The teacher thinks about how a lesson worked and adjusts future lessons based on its success.

The essence of teaching requires a deep and thorough understanding on the part of the teacher of the

subject being taught. Each university student participates in courses devoted to teaching K-12 content areas, as well as courses concerning literacy, language, speech, and audiology instruction. Integrating speech, audition and language, within K-12 content areas is emphasized throughout the curriculum. Research-based practices are integrated through the use of two core textbooks, used in each of their university classes in addition to other course-required texts. Research from *Language and Deafness* (Paul, 2009), and *Deaf Studies, Language, and Education* (Marschark et al., 2003) provide a foundation for content instruction and appears in the comprehensive exam that all students take at the end of their graduate studies. In order to be highly qualified according to *No Child Left Behind*, students are encouraged to pursue additional hours in a teaching field such as history, math, science or computer technology (No Child Left Behind, 2009).

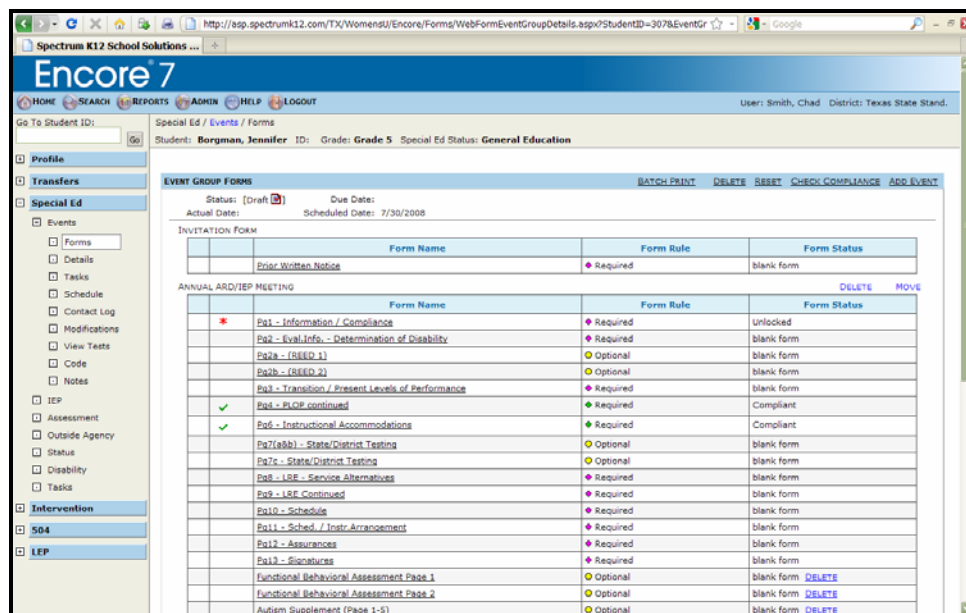


Figure 1: Screen capture of ENCORE special education management system used to teach the Individualized Education Plan (IEP) process in deaf education.

Video Creation for Methods and Case Studies

To determine whether pre-service teachers can effectively demonstrate the competencies required students must create videos of themselves teaching and performing case study elements. Once created, videos are submitted directly to instructors, posted within the course delivery system, or posted online at a video hosting service such as www.teachertube.com.

Knowledge of Content through Technology

Distance education creates authentic opportunities for students to read and write using the content language of each subject in the print format (Downing & Holtz, 2008). Being able to enhance complex content with images, video and hypertext media allows instructors to delve deeply into teaching content areas that might otherwise seem inaccessible in a text-only format. In addition to creating PowerPoint presentations and lesson plans in their methods courses, students must also create K-12 student examples of expected work products. Students demonstrate that they understand that content can be delivered using both controlled reading levels and multimedia content together. An example of such a work product is the *Deaf Scientist Corner* (<http://www.twu.edu/dsc>) which was developed by faculty and a graduate student to demonstrate the effectiveness of incorporating meaningful multimedia content with text specifically written on a third to sixth grade reading level.

Distance education has progressed beyond the stereotype of correspondence coursework. Members of the faculty are able to maximize student potential and demand high performance because the technology allows them to see their teachers-in-training perform. Online programs move beyond paper writing and written constructions of intended teaching plans for more substantive products such as examples of teaching lessons and assessment techniques. Using the research-based textbooks throughout the

curriculum and the innovation afforded by technology, students demonstrate deep knowledge through the creation of visual multimedia-based representations of both effective teaching and assessment practices.

Trait #2: Being up-to-date

Bond (2000) identified using a variety of resources as a characteristic of effective teachers.

Online students in the program have extensive opportunities for obtaining teaching experiences with deaf and/or hard of hearing students in schools and classrooms in their own communities. Students are expected to conduct practica and class-related projects within their own communities. Regardless of where online students are located, the deaf education program mandates that pre-service teachers follow university guidelines for student teaching and practicum experiences. Teller and Harney (2005) surveyed supervisors of programs serving deaf and hard of hearing students and reported these practica and student teaching experiences as one of the major factors affecting teaching performance. Informed by their research, we know these experiences do affect future teacher performance, and are therefore, carefully planned. They can be individualized and local, matching the learning experience of the student with the unique teaching requirements of each setting and program. Students explore as many options as possible for their observations and student teaching experiences. Students have the option of meeting Texas certification requirements and transferring them out of state or meeting home-state requirements.

Integrating Field-Based Experiences with an Online Community of Learners

During these in-field experiences, the network of online peers themselves becomes an invaluable resource. As they complete field work, they share their experiences in the virtual classrooms through e-mails, listservs, chats, Web pages and wikis. In this way, online students have shared experiences that far exceed the limited experiences a university can offer locally. Students discuss assessments, share current teaching resources and reflect on teaching experiences across the continuum of educational settings, communication methodologies and regional and national borders. Online instructors can capitalize on varied experiences and ever-changing perspectives of students across regions, programs and borders. Research interests are developed within the realm of students' own teaching areas and situations throughout their coursework. As a capstone experience, students have the opportunity to design and conduct individual research projects with faculty support that center on current issues surrounding their own K-12 classroom environments.

Trait #3: Having a passion for teaching

Bond (2000) identified that effective teachers respect students and have a passion for teaching and learning.

Access to Multimedia

Online students are linguistically and culturally diverse so preparation programs must address what each of the learners experience as they participate in these new learning environments. Hannon and D'Netto (2004) surveyed 241 online students in South Australia. Their purpose was to see if learners from different cultural backgrounds would find online environments culturally inclusive in terms of engagement with the content and with the learning and teaching environment. They found no significant differences between their Australian students compared to non-native Australian students. No matter what the subject area is, the delivery of course content is a flexible model, and is one that is not limited to text-only approaches for students. New technologies allow for transmitting large amounts of data, and being able to interact in a variety of formats, so that students have a multitude of learning opportunities online. With video technology that can be posted on the Internet, there are few limitations to offering examples of effective teaching practices by both the instructor and the students. For those students who need access to information in formats other than text, systems such as *Wimba®* and *Camtasia®* allow instructors to capture lectured content which can be spoken and signed, in sync with multimedia presentations. Using this kind of resource, students can view lecture presentations repeatedly at their own convenience.

Equality within Online Environments

Bond (2000) explained teachers must appreciate the critical distinctiveness of students and use those differences to guide decisions. Training teachers to have this 'sensitivity to context' is difficult to teach and assess. Online learning allows teachers to develop this sensitivity to context because of the equality it creates between learners. Each student is heard equally. Everyone has a voice and all students have direct access to the information and to their classmates and instructor. With video instruction, interpreters for the deaf students are not used for the online program. Professors sign their lectures. Unlike the face-

to-face classroom, instructors cannot identify which students in the program are hearing, deaf or hard of hearing. In this way, both instructors and students come to know the essential characteristics of each member of the class without the language barriers and any preconceived beliefs or biases that might come with the use of "labels." Instructors typically ask students to identify themselves early in the course and share their information with others. They are not required to identify themselves as having a hearing loss, but are certainly welcome to do so, if they wish.

Trait #4: Working Collaboratively

Bond (2000) identified optimal classroom environments and problem-solving as characteristics of effective teaching.

Networking via Discussion Boards and Wikis

Johnson (2004) suggested that a stronger model for deaf education teacher training programs must include what he calls "a collaborative network" in which teachers construct new knowledge together. Pre-service teachers in the online classroom experience this new model of a virtual learning environment and a collaborative network with their professors and classmates. Through online discussions, video presentations, and networking pre-service teachers are able to experience academic issues related to a multitude of K-12 deaf education students and approaches used nationwide.

Online learning may overcome many of the challenges that teacher-training programs faced in the past. Pre-service teachers now have instant access to experts and information that is not available locally. While local programs are limited to experts available in the area, online programs can invite experts to join classroom discussion boards from any place with access to the Internet.

Effective distance courses create a collaborative network that is ideal for problem-solving with other professionals (Palloff & Pratt, 2005; Palloff & Pratt, 2007). Instructors and students interact using learning tools with public and private access via academic wikis and blogs. Instructors and students can simulate the team approach to problem-solving by posting case studies on a wiki within the course management system. Classmates add their own analysis to the case study. As with the Annual, Review, and Dismissal (ARD) meetings, a comprehensive view with multiple perspectives deepens the pre-service teacher's understanding of the strengths and needs of the K-12 deaf education student. Graduate students include speech therapists, teachers of the deaf, regular education teachers, parents, social workers and interpreters. Instructors can watch student knowledge and problem-solving being constructed, and intervene as necessary.

Being able to 1) tap into the expertise and excitement that university online faculty have for teaching, and 2) have the hands-on experience of working with a deaf education K-12 classroom teacher throughout their graduate career, complements teaching and learning in unique ways. Experiential, active learning supports the web course learning. Research indicates that in addition to online interaction, flexibility and timing, the classroom observation experience is most beneficial (Schrum, Burbank, & Capps, 2007).

Teacher candidates in online classes collaborate inside their course delivery systems, and also work in public domains such as wikis. Wikis are available currently to graduate students on Deaf Culture, deaf Scientists, strategies for teaching speech, Web ideas for instruction, and women and deafness. Individual instruction regarding wikis may vary. Typically, pre-service teachers are assigned topics to explore and promote within the wikis. Once material is posted, classmates have the opportunity to enhance and edit that material as peer reviewers.

Trait #5: Demonstrating Strong Communication Skills

Bond (2000) identified progress monitoring, providing feedback, and testing hypothesis as characteristics of effective teachers.

Google Talk, Oovoo, Video phones

Providing student feedback and monitoring student progress is not limited to a typical 8-hour workday. Maintaining the standard business day office hours and ability to interact within limited on-campus timeframes are no longer factors in online learning. Faculty office hours and interaction times can be constructed in order to meet the needs of students. Evaluations on student progress can occur virtually within an "any-time, any-place" mentality. Student assignments submitted electronically can have comments/suggestions inserted directly into items providing meaningful, lasting feedback. Blackboard's gradebook feature allows teachers to post comments on grades and work performance so students are able to monitor their own progress. Face-to-face communication is an option available through the use of video-phones and Web cams. While e-mail tends to be a common method of communication between

faculty and students, there are a number of other available options. One option the authors have explored is using *GoogleTalk*[®] to communicate with online students. It is a free tool that is available to anyone, so both students and faculty have easy access to it. They are able to communicate synchronously on a nightly basis and provide feedback, problem-solve and brainstorm classroom issues as they arise.

The use of *Wimba*[®] has also become an important tool for communicating with students online. Instructors have the capacity to communicate simultaneously in sign, text, and through the use of multimedia such as PowerPoint. Students are able to experience firsthand the multi-layered strategies necessary for communicating in a linguistically diverse environment. Hearing students, when experiencing audio difficulties within the environment, may call-in to the course, and participate via phone. Similarly, deaf students who experience difficulties with the video communication may call-in to the course environment through a sign language relay interpreter such as ZVRS or Sorenson Relay. In order to meet the demands of such voluminous electronic communication, it is imperative both hearing and deaf students have effective communication skills.

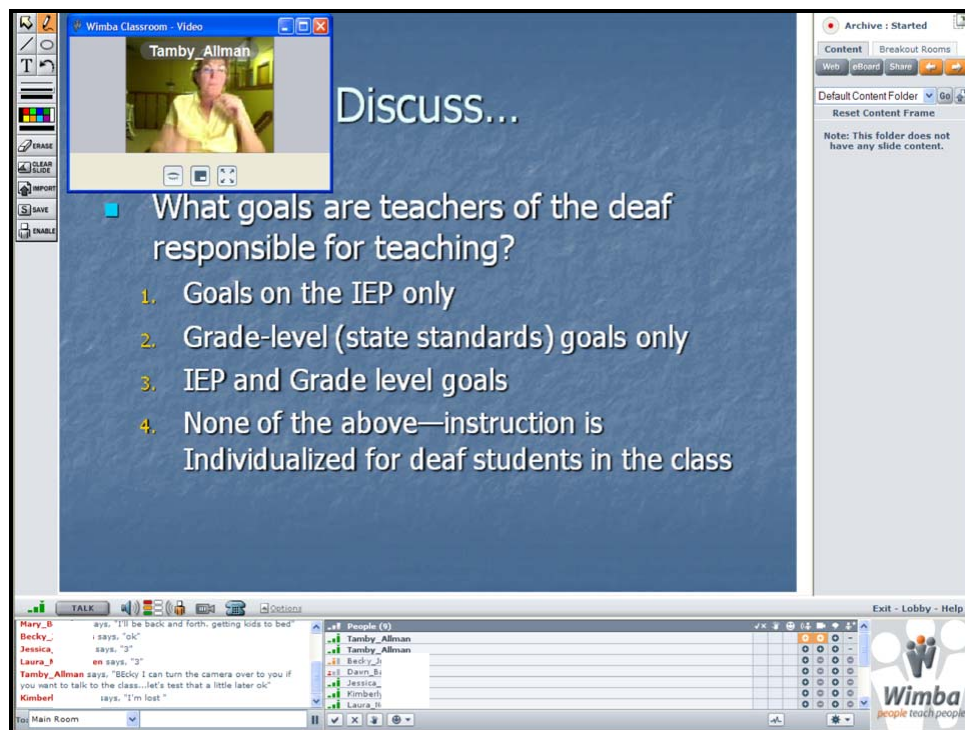


Figure 2: Screen capture of Wimba classroom with video, audio, and text chatting capabilities.

Using the experiences they acquired in the electronic classroom, students must then change roles and become teachers. They must demonstrate a high level of awareness in the interactions with their own K-12 students. Pre-service teachers are required to teach, assess and demonstrate their understanding of the teaching theories presented online. Pre-service teachers are asked to test ideas related to appropriate teaching methodologies, assessment tools, and learning activities. In local school programs, pre-service teachers have the opportunity to test hypotheses in classrooms serving K-12 students with hearing loss.

Once in the field, those students must apply the communication skills acquired in the program to various communication modes of the K-12 students they are serving. Texas requires all teachers using manual communication as the primary form of communication in a classroom for deaf children to demonstrate competency in receptive and expressive sign skills. As preparation for that test, the faculty created an online American Sign Language competency test to evaluate students' expressive and receptive sign skills. The tool can be used at any point during the students' studies when she/he feels ready to take the test. The assessment consists of a twenty-minute interview using Oovoo (<http://www.oovoo.com>), an online communication interface that allows participants to communicate via audio and video. Students are

required to connect with a faculty member via Web cam, and are interviewed in ASL or an English sign system of their choosing. The video conversation is captured, recorded, and then shown to a panel of faculty who evaluate the students' expressive and receptive skills.



Figure 3: Screen capture of Oovoo used for assessing distance education students' sign language proficiency.

Trait #6: Creating Independent Learners

Bond (2000) identified improvisation, problem-solving, progress monitoring and inquiry as characteristics of effective teachers. He also indicated that the teacher gets the students actively involved in lessons and helps them want to learn and develop a deeper understanding of issues.

Electronic Progress Monitoring and Inquiry

Scheetz and Martin (2006) recommended that teacher training programs include the criteria for National Board Certification in their curricula. Self-evaluation and reflection of videotapes create a powerful learning experience for pre-service teachers. Using their own videos, teachers demonstrate how they modify their instruction to meet the needs of all learners. Unlike classroom environments with mock teaching demonstrations in real time, online students have opportunities to go back and teach a lesson again with substantive changes. Students in an online environment can create and evaluate multiple teaching content videos and presentations that can be easily shared with others, regardless of the physical distance that separates them. In addition to teachers being able to view and evaluate presentations and teaching skills, instructors are able to gauge and monitor sign skills. By requiring students to sign and caption videos they created, faculty insures that content is both accessible and meaningful. By completing such technology activities, pre-service teachers of the deaf address many of the national educational technology standards (ISTE, 2008).

Accessibility with current technology is relatively easy. Even the most basic of video creation software such as *Windows Movie Maker* allows users to caption video. Captioned text that is embedded on a video is different than printed transcripts that accompany videos. Creating printed transcripts for students who are deaf/hard of hearing can be time-consuming and confusing to follow. Printed transcripts, however, can be created with speech-recognition software found in word processing software such as *Microsoft Word*.

The WWW allows teachers of the deaf to access, create, and modify materials to specifically meet the unique needs of their students. For example, in content methods, to address the lack of accessible science investigations, pre-service teachers create videos that demonstrate the scientific method. (<http://deafscientistcorner.pbworks.com>). They develop science lesson plans that include biographies of famous deaf scientists that are found online within the university website (<http://www.twu.edu/dsc>). Using

technologies learned in the online program, students return to their own schools to create materials uniquely appropriate to their K-12 students.

Reflection and Improvement through Asynchronous Learning

The asynchronous nature of some online courses and the permanence of print provide the learner with time and opportunities for deep reflection that isn't always part of the face-to-face classroom. Asynchronous learning provides students and instructors the opportunity to reflect on the classroom communication and compose their responses. Instructors who teach the same course in both face-to-face format and online format frequently report that the discussions and collaborative problem-solving skills among the distance learners are qualitatively different. The permanence of print and the asynchronous nature of online learning provide time for the students to reflect and revise their responses. Distance education instructors can continually monitor the effectiveness of their own instruction and modify it as necessary throughout the course. Students therefore experience the evolving and interactive nature of teaching.

Concluding Remarks

Because a wide array of materials can be transmitted via the Internet, there is no shortage of tools to be used within the course management system. Audio and video links to multimedia found on the Internet are just a few of the resources available to online students and faculty. Online learning environments offer a unique perspective for training future teachers of the deaf. With the assortment of technologies, faculty have access to teach students in synchronous and asynchronous environments with video, audio, and multimedia elements which allow for printed, signed, and spoken delivery of content. Even institutions on limited budgets are able to secure software such as *Adobe Visual Communicator™* and *Camtasia®* that allow for materials to be presented visually through sign and multimedia.

With accessible instructional strategies, faculty can successfully prepare future teachers of the deaf in online environments. Online learning is uniquely suited for training as it allows programs to employ instructional approaches to develop master teachers of the deaf. It allows programs to incorporate state of the art technology, give equal access to all learners at all times, create independent learners, promote strong communication skills among students, and create a network for collaborative learning.

Recommendations for future research include multi-faceted empirical studies of the effectiveness of online programs training future teachers of the deaf. Such studies should go beyond the technology and should evaluate the online delivery systems used, the process of learning online, and the course content delivered.

References

- Bond, L. (2000). *A distinction that matters: Why national teacher certification makes a difference*. Arlington, VA: National Board for Professional Teaching Standards.
- Bowen, S. (2000) Hispanic Deaf Students in Rural Education Settings: Complex Issues (Eric Document Reproduction Service No. ED439875).
- DeafEd.net. (n.d.). Retrieved on 11 March, 2009 from <http://www.deafed.net/PageText.asp?hdnPageld=120>
- Downing, K. F., and Holtz, J.r K. (2008). *Online Science Learning: Best Practices and Technologies*. Hershey, PA: Information Science Publishing.
- Easterbrooks, S.R. (1999). Improving practices for student with hearing impairments. *Exceptional Children*, 65(40), 537-554.
- Hannon, J. and D'Netto, B. (2007). Cultural diversity online: Student engagement with learning technologies. *International Journal of Educational Management*, 21, 418-432.
- International Society for Technology Education (ISTE) (2009). Retrieved on 19 March 2009 from <http://www.iste.org/AM/Template.cfm?Section=NETS>
- Johnson, H. (2004). U.S. deaf education teacher preparation programs: A look at the present and a vision for the future. *American Annals of the Deaf*, 149(2), 75-91.
- Kerr, M., Rynearson, K., & Kerr, M (2006). Student characteristics for online learning success. *Internet and Higher Education*, 9, 91-105.

- Mitchell, R.E., & Karchmer, M.A. (2006). Demographics of Deaf Education: More Students in More Places. *American Annals of the Deaf*, 151, 95-104.
- No Child Left Behind: A Toolkit for Teachers (n.d.). *Highly Qualified Teacher Requirements*. Retrieved on 1 May, 2009 from http://www.ed.gov/teachers/ncibguide/toolkit_pg10.html#requirements
- Palloff, R.M. & Pratt, K. (2005). *Collaborating online: Learning together in community*. San Francisco: Jossey-Bass.
- Palloff, R.M. & Pratt, K (2007). *Building online learning communities: Effective strategies for the virtual classroom*. San Francisco: Jossey-Bass.
- Richardson, J. & Woodley, A. (2001). *Approaches to studying and communication preferences among deaf students in deaf education*. *Higher Education*, 42, 61-83.
- Rittenhouse, R. (2004). The beginning teacher of the deaf in the United States. In R.K. Rittenhouse (Ed.), *Deaf Education at the Dawn of the 21st Century (180-199)*. Hillsboro, OR: Butte Publications
- Scheetz, N. & Martin, D. (2008). National study of master teachers in deaf education: Implications for teacher education. *American Annals of the Deaf*, 153(3), 328-343.
- Schrum, L., Burbank, M., & Capps, R.(2007). Preparing future teachers for diverse careers in an online learning community: Perceptions and practice. *Internet and Higher Education*, 10, 204-211.
- Teller, H. & Harney, J. (2005). *Views from the field: Program directors' perceptions of teacher education and the education of students who are deaf or hard of hearing*. *American Annals of the Deaf* 2006, 150(5), 470-479.

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