

# **A discussion on the technologies used for a post-secondary distance and technology delivered education: An Alaskan Perspective**

Adam Kane, Rural Development MA  
University of Alaska Fairbanks – Bristol Bay Campus

## **Abstract:**

*For more than a century, students have been pursuing post-secondary educations far away from the formal campuses, lecture halls and classrooms of a college or university. In the past 20 years, there have been major advancements in communication technologies that have allowed interactive courses to be developed and matured. Distance education has become vital to people living rural Alaska, due to the remoteness of the communities, increased employment opportunities locally for those with higher levels of education, and improved communications worldwide which have created the need for rural residents to compete in a global marketplace. Currently there are a number of technologies used by universities to provide a quality education to those in rural Alaska, some of those technologies have been used for decades, and others are relatively new. In my paper I will compare the advantages and disadvantages of the various technologies from the perspective of the teachers, students and administrators. The analytical comparison is intended to help those stakeholders identify which tools will work best to provide a quality distance education in rural Alaska.*

## **Evolving Education: An Introduction**

Alaska is a diverse state with thriving communities spread out over a vast area. The State has a population of more than 710 thousand people, the majority of whom live in urban centers and the rest live throughout the state's 355 cities and census designated areas (Alaska Wikipedia). Since the late 1970's when the State was required to build schools in many rural communities the need to travel for a K-8 education has largely been reduced. Many communities, however, still do not have high schools and so after 8<sup>th</sup> grade many rural students will have to leave their homes for a secondary education.

When students are done with high school, either completed or not, many of them return to their home or surrounding communities. In time, many of those students will realize a need for continuing their education. Often this can be related to increased appetite for knowledge, lack of employment or want of a higher salary.

When a student does decide to begin a post secondary education, they must consider a few things. How they will attend school, and whether it's a tech school, or university. The students need to figure out how they will be able to take the time off of work or family to complete their education, which can take many years to complete. A

student must also look at how they will be able to afford their education, which typically costs many thousands of dollars per year and predict the outcomes of their education will provide.

Very few communities in rural Alaska have University campuses, this means that many of those who complete high school are required to move to a different, generally larger, community to attend college unless they decide to enroll in distance and technology delivered courses. For many decades now, Alaska's rural residents have depended on distance delivery to satisfy their need for a quality post secondary education.

It's important now to look at what the various types of technologies are that have been, or are currently being used, for distance education and then ask the question, what works and what doesn't work for distance delivered education in rural Alaska? The community that collaborated in this research project included some of the primary stakeholders associated with post secondary distance delivered courses in rural Alaska. This included students, instructors, administrators, and technicians.

In order to find out more about the historical and current status of distance education technologies in rural Alaska I used a variety of techniques. My primary methods included key informant interviews, online historical and archival Research (also called cybermethodology), technological analysis, and passive participant observation.

What was found, was that the story of distance education is a long and continuing one. It also became clear that with the rapidly increasing demand for faster worldwide communications, rural Alaska's lack of connectivity has become more and more noticeable in regards to education. The technologies that are being developed for the future elsewhere, aren't necessarily working well on our networks and so we're resorting to use those technologies that have been around since the beginning. As we continue to develop new distance delivered courses we must also continue to work on our infrastructure, virtual learning will be possible in rural Alaska.

### **History of Distance Education in Alaska: The Boarding School and Beyond**

Western education was first introduced in Alaska in 1843 when the Russian-Greek Orthodox Church established the mission school at Nushagak (Education Timeline 2007). As the last shots were being fired of the Civil War in the United States, numerous other religious institutions began to construct churches and mission schools around

Alaska. Some of those organizations included the Swedish Evangelical, Moravian, Presbyterian, Episcopalian, Congregational, and Roman Catholic Churches (Education Timeline 2007).

Approximately 15 years later, in 1884 the United States established the "District of Alaska", at this time the its first code of laws were enacted as well as funding allocated for education to be distributed among the existing mission schools. The following year, Dr. Sheldon Jackson was appointed as the general agent for education in Alaska. In 1887 the use of English was required to be used and taught at Indian Schools (Education Timeline 2007).

At the end of the century, in 1899 educational authority was granted to local communities in order to setup their own School Boards (Education Timeline 2007).

In 1905, the Nelson Act was passed. This act authorized the construction of schools outside of incorporated communities and required a minimum of 20 white students at each school. Section 7 of the Nelson Act required, "That the schools specified and provided for in this Act shall be devoted to the education of white children and children of mixed blood who lead a civilized life. The education of the Eskimos and Indians in the district of Alaska shall remain under the direction and control of the Secretary of the Interior, and schools for and among the Eskimos and Indians of Alaska shall be provided for by an annual appropriation, and the Eskimo and Indian children of Alaska shall have the same right to be admitted to any Indian boarding school as the Indian children in the States or Territories of the United States." (Education Timeline 2007)

The Nelson Act was detrimental to the education of the Alaskan Native population in the rural areas.

In 1912 Alaska became a territory with its own legislative government. And 5 years later, the first boarding schools were established by a number of churches and the federal government who constructed its school in White Mountain (Education Timeline 2007). In 1917 the Alaska Agricultural College and School of Mines was established as the Alaska Agricultural Experimentation Station. They began offering classes in 1922 (University of Alaska Fairbanks 2012).

In 1924, the Indian Citizenship Act was passed granting United States citizenship to all American Indians and Alaska Natives (Indian Citizenship Act of 1924 2012).

In the early 1930's control of Alaskan Native education was transferred to the Office of Indian Affairs which later was known as the Alaska Indian Service and then later the Alaskan Native Service (Education Timeline 2007). Also the Wrangell Institute Boarding school was opened as an Alaska Indian Service School. In 1935 the Alaska Territorial Legislature renamed the Alaska Agricultural Experimentation Station to the University of Alaska (University of Alaska Fairbanks 2012).

At the end of World War II, the Alaskan legislature passed a law ending legal segregation in Alaska (Education Timeline 2007).

In 1947, the Bureau of Indian affairs opened Mt. Edgecumbe as a boarding school for Alaska Natives. The school was a former military installation in Sitka (Education Timeline 2007).

During the 1950's the Johnson O'Malley Act was passed transferring control of the schools in Alaska to the Territorial Government (Education Timeline 2007). Education specialists were also placed in district offices in order to better consult teachers. The federal Bureau of Indian Affairs released the first edition of "We Teach in Alaska" a manual for BIA teachers in rural Alaskan schools. In 1954, The Anchorage Community College began operating at night in the West Anchorage High School building (University of Alaska Anchorage 2012). At the end of the decade, Alaska became the 49<sup>th</sup> state of the United States of America.

In 1960, BIA began its first secondary level school program with the establishment of a 9<sup>th</sup> grade Unalakleet (Education Timeline 2007). In the late 1960's the state opened its first regional boarding school, the William E. Beltz School. A workshop was also held for all educators to emphasize a linguistic method for teaching English as a second language (Education Timeline 2007). In 1969, the Anchorage Senior College began teaching higher level courses (University of Alaska Anchorage 2012).

In 1970 Kotzebue Community School began the state's first bilingual education at a primary and high school level (Education Timeline 2007). In 1971 the Alaska Native Claims Settlement Act was passed into law.

In 1972 the Kuskokwim Campus in Bethel was opened becoming the State's first Rural Community College (College of Rural & Community Development History 2012). In 1975 the Fairbanks Campus became officially known as the

University of Alaska Fairbanks (University of Alaska Fairbanks 2012). The Northwest Community College opened in Nome that same year.

It's not until 1976 that the "Molly Hootch" or Tobeluk vs. Lind case was settled. This resulted in the abandonment of the Nelson Act and a commitment by the state to provide local high schools in more than 100 rural Alaska Native communities, ending the segregated boarding school education system and allowing Native children to continue beyond eighth grade in their home communities. The settlement also paved the way for many more Native youth to continue on to higher education (Miller 2009).

In 1977 the College of Rural Education and Extension was created to unify many of Alaska's rural community colleges (College of Rural & Community Development History 2012). The Chukchi Community College was created in Kotzebue in 1980 and the Bristol Bay Campus was opened in Dillingham in 1987. It was also in 1987 that the Anchorage Senior College merged with the Anchorage Community College and several of the rural extensions to become the University of Alaska Anchorage (University of Alaska Anchorage 2012).

In 1988, the College of Rural Alaska was formed and included the Chukchi, Kuskokwim, Bristol Bay, Interior-Aleutians, and the Tanana Valley Campuses as well as the Center For Distance Education, Department of Rural Development, Social Work, Psychology, Human Services, and Rural education for the University of Alaska Fairbanks (College of Rural & Community Development History 2012).

In 2004 the name College of Rural Alaska was changed to the College of Rural and Community Development (CRCD) (College of Rural & Community Development History 2012).

In 2010 the Alaska Native Studies program at the University of Alaska Fairbanks was transferred to the CRCD's Department of Alaska Native and Rural Development (College of Rural & Community Development History 2012).

### **Technology Brings Education to the People: College by Correspondence, One Way Instruction**

Distance Education in the form of correspondence education, has been traced back to the early 1700's (Jeffries July 4, 2008).

In 1852, the Phonographic Institute in Cincinnati, Ohio, offered a training course for secretaries to learn how to write shorthand, this is believed to be the first course offered via correspondence mail in the United States (SUide830 2012). The Phonographic Institute was following a model that had been developed by the brother of the schools founder, Isaac Pitman, more than 10 years earlier in Bath, England (Benjamin Pitman 2012). Throughout the next half century a number of schools began to offer correspondence degrees including Illinois Wesleyan University in 1874 (For Adult Educators 2012), and Correspondence University which was established in New York in 1883 (SUide830 2012)d. A few years later the University of Chicago began to offer a number of degrees through correspondence study (SUide830 2012).

Correspondence was the sole form of distance education instruction until the early 1900's when audiovisual technologies began being introduced into schools. Instructional films and their projectors were among the first media devices used in schools, and the first catalog comprised of more than 1000 instructional films was published in 1910 by George Kleine (Timeline of Instructional Film, Radio, and Television 2012).

Just 3 years later, inventor Thomas Edison projected his vision of the future when he said, "Books will soon be obsolete in the schools.... It is possible to teach every branch of human knowledge with the motion picture. Our school system will be completely changed in the next ten years." (Quote Investigator 2012)

Throughout the next decade as many as five national professional organizations for visual instruction were created (scottherman 2012). Much of the visual instruction taking place was through the use of film and slides (Jeffries July 4, 2008) that could be sent around the world and projected in classrooms, so long as there was electricity available.

At the same time as film, radio began to be used as a method of transmitting educational instruction (SUide830 2012) over vast distances. In 1921, the Federal Communication Corporation granted radio broadcasting licenses to the University of Wisconsin, Minnesota and Salt Lake City to transmit radio based educational programming (SUide830 2012). Despite the initial interest, instructional radio never became widely used (Jeffries July 4, 2008).

In 1915, the National University Extension Association became responsible for the accreditation of correspondence education. About a decade later, In 1926, two organizations were founded to address the problems of quality and ethics, the National Home Study Council and the Distance Education and Training Council (For Adult Educators 2012) (Distance Education and Training Council 2012).

Both film and radio eventually led the way to instructional television which continues to be used for education today. The first experiments with transmitting instructional courses to televisions took place at the State University of Iowa in 1934, years before televisions were introduced to the world at large at the New York World's Fair (Jeffries July 4, 2008).

Audiovisual instructional film and slide technologies were widely used for training during World War II, however television technologies were not. Following the war and throughout the next decade major advancements were made in television technologies and a number of educational institutions began broadcasting instructional programming (Jeffries July 4, 2008).

Results of early research comparing the success of television delivered education with conventional, face to face, instruction appeared to be very promising (Jeffries July 4, 2008).

Educational television use continued to grow through the 1950's and by 1961 more than 50 stations were affiliated with the National Educational Television Network. Those stations primarily shared films and coordinated schedules with each other (Jeffries July 4, 2008). Television delivered education use began to wane in the late 1960's and early 1970's as funding began to shift towards public television.

In 1970 Coastline Community College began offering televised college courses, it was the first university in the United States to do so without having a physical campus (SUide830 2012).

There have been a number of reasons given for the shortfall of instructional television including, the expense of televisions, teachers resistance to televisions in the classroom, and ultimately the inability for television alone to meet the necessary conditions for learning (Jeffries July 4, 2008). Despite the issues found with television instruction, in 1972, the Carnegie Commission on Higher Education predicted that more than 80 percent of off-

campus and 10 to 20 percent of on-campus instruction would take place through telecommunications by the year 2000 (Jeffries July 4, 2008).

By the late 70's and early 1980's schools were using closed circuit and microwave transmission technologies to broadcast television to regional campuses and other universities (Jeffries July 4, 2008). It seemed that, for the first time, those regional students were part of the extended classroom. These technologies allowed students to access real-time classroom instruction away from the conventional teaching institutions (Jeffries July 4, 2008).

Despite the advancement in technologies, correspondence education has never ceased to be necessary and it continues today with learning institutions distributing digital or analog videos, audio, books, computers, and other course materials through the mail.

As instructional distance education evolved and came into its own, the effort began to stray further away from being equated to specific audiovisual devices and into the movement as a whole.

### **Technology Brings Education to the People: Dial a Degree, Two Way Instruction**

The 1980's were a pivotal time in the evolution of distance education worldwide.

Film, Radio and Television had already been in use for decades and had documented positive and negative educational results (Timeline of Instructional Film, Radio, and Television 2012). Although the telephone had been in existence for more than a century, and despite the fact that the technology was proven to be reliable in many situations, it wasn't until advances were made in computerized teleconferencing technologies and rural telephone systems were enhanced that telephones became an option as a distance education delivery method.

With audio teleconferencing, students and teachers could talk and listen to each other in real time, generally without delays, across the country and around the world.

Computer technologies have progressed with great speed since the development of the transistor and the integrated circuit in the middle part of the 20<sup>th</sup> century. The first computers took up enormous physical space and were very limited in their use. As they shrank in size, programs were developed to make them more user friendly



as well. Newer computer processors were produced with more and smaller transistors able to process calculations more quickly than before. With the increase in processing speeds, digital computers began to take over tasks that had previously been completed by analog machines or humans including telephone switching (Telephone Switching 2012). About this time in the early 1980's computers became small and cheap enough for use in the home. By 1983, a study conducted by the Center for Social Organization of Schools found that computers were being used for instruction in more than 40 percent of all elementary schools and more than 75 percent of all secondary schools in the United States (Becker 1984).

Computer technologies continued to advance and as computers were more and more able to communicate with each other, humans began to realize the potential for passing information through them. This became the era of email, listservs, discussion boards, and other online course delivery systems (scottherman 2012).

Many universities and educational institutions were early adapters of the internet and its tremendous possibilities (For Adult Educators 2012). Since the early days of the internet in the 1990's, the "world wide web" has been a Mecca for knowledge.

The internet and associated computer technologies have since paved the way for new distance education pathways. These include one way, two way and multi directional communications between teachers, students and learning materials and can include the use of websites, videos, audio, etc.

In 2012, it is estimated that nearly all university and post secondary educational institutions in the United States have an online presence of some sort (Cox 2011). Every public elementary, middle and high school in the United States uses computers for instruction and often as a link to the internet (Nagel 2010).

### **Current and Proposed Technologies for post-secondary distance education: an Alaskan Perspective**

The University of Alaska system has been and continues to work on improving course design specifically for distance delivery (Gering 2012). The University has many professors, however those professors are not always experienced in distance education. The UAF Center For Distance Education helps instructors to learn the correct pedagogy for asynchronous online trainings, helping instructors understand how to teach to learners who aren't in

the same room. CDE also has a unique system for paying instructors, 2 contracts are used, one for the instructional designer and one for the instructor (Gering 2012). This encourages the development of quality distance delivered courses.

A large amount of distance delivered post secondary education courses in Alaska are offered through the University of Alaska system and its 16 rural campuses (Distance Education/Information Technology FY '05 - FY '10)s.

There are currently more than 54 Thousand full and part time students in from an area that is one-fifth the size of the continental United States who are enrolled in University of Alaska Schools (Distance Education/Information Technology FY '05 - FY '10). It is not unusual for students in rural communities to take up to ten years to complete a college degree program (Maria Elena Reyes 2001).

Many of those students are living in rural “off the road system” communities. Because of their remote locations and small populations, many of those communities have little in the ways of modern communications infrastructure such as high bandwidth fiber optic cables and high speed mobile phone networks which are often available in larger urban communities on the road system.

Despite connectivity issues, in 2010, there were more than 18 thousand University of Alaska students taking Distance and Technology Delivered (D&T) courses (Distance Education/Information Technology FY '05 - FY '10). The percentage of students enrolling in D&T courses has risen by more than 45% between 2005 and 2010 (Distance Education/Information Technology FY '05 - FY '10).

In rural Western Alaska, until early 2012, there was no link to the outside world other than through satellite communications. GCI has begun to implement its terrestrial based microwave/fiber optic cable link in rural Southwest Alaska, however many communities are not yet connected and will not be connected to the high bandwidth link for some time.

For distance education the lack of connectivity means that many of the newest technologies being developed and implemented by many learning institutions, including the University of Alaska, will not be fully taken advantage of. This will likely result in slower or smaller educational advancements for many of the State’s rural residents.

Despite the connectivity issues, technologies continue to be developed which have dramatically improved the quality of education for those capable of accessing it.

There are at least 4 different methods currently in use by instructors with the University of Alaska for delivering information and materials for a distance delivered course including correspondence/mail, the telephone/teleconference, synchronous and asynchronous virtual classrooms.

### **Wait a Minute, Mr. Postman...**

Despite the fact that it was the first method used for delivering a distance education, correspondence delivery at the University of Alaska is still in use today. Correspondence study has been offered at the University of Alaska Fairbanks (UAF) since the late 1950's (Gering 2012). In the late 1990's the UAF began phasing out paper based correspondence packets due to student demand for digital and online materials.

The self contained correspondence packets contain a course guide, lecture materials as well as lessons for each week (Gering 2012). Students are responsible for completing their work and mailing it to the UAF Center for Distance Education (CDE). The CDE supports students by facilitating the handling of papers between students and instructors, this takes some of the burden off of the instructor.

Correspondence classes are beneficial in some ways over a synchronous online or classroom taught course.

Correspondence classes are asynchronous, or self paced, which allows a student to complete the work on their own time. Some students also might be more accustomed to reading documents on paper instead of on a computer screen, which could make the student more comfortable and thus more successful. Correspondence is also a good method for delivering course materials that aren't written documents, including models or tools, both of which aren't possible to receive electronically.

There are also downsides to delivering a course through correspondence mail. One negative aspect is the actual amount of time needed between the submission of assignments, questions or comments and the response from the instructor. If mistakes were made or questions needed to be answered in order to complete the course work, a student could be delayed and cause issues with them completing the course on time. Correspondence courses can

also cost the student a small amount each time they have to mail something in to the instructor. Correspondence students could be a burden on an instructor, requiring the teacher to make adjustments for each student depending on their situation. By facilitating the passage of communications between the teachers and the students, the CDE has alleviated much of the burden.

The CDE has conducted studies and found that correspondence delivery isn't as successful as other forms of distance delivery because students weren't as aware of other students in course resulting in the lack of a cohort experience. Students had only the instructor to review their work and assist them with learning the material (Gering 2012).

### **If You'd Like to Make a Call...**

The audio conference bridge, more commonly referred to as a teleconference or simply audio in the course catalog, has been the primary source for distance education delivery at the University of Alaska since the 1980's and it continues to be used today more than 30 years later by many instructors in the UA system (Kowalski 2012). Telephonic courses are delivered synchronously, in real time, so that students and teachers can have a more traditional style class with lecture, question and answer as well as the cohort experience and peer review.

There are many benefits and drawbacks from using a telephone based system for distance education delivery in rural Alaska. One positive aspect is that telephones are now available in virtually every continuously inhabited community in the state. Throughout the past 30 years, in many rural communities, telephones have moved from central locations into the home so that a vast majority of Alaskan residents are capable of participating in distance delivered courses. Even mobile phones are now available in most communities and with subsidized pricing for eligible customers, each member of a household is capable of having their own phone. The convenience of mobile phones allows students to participate in class wherever they are, even if they are traveling.

There seems to be a very small learning curve for students using telephones for class. This is presumably because telephones have been in use in many rural communities for decades. Despite their relative ease of use, however, there are still some minor difficulties with using some of the special features available in the teleconference (mute,

un-mute, record, etc...). One negative aspect of using a telephone delivery method for a course is that some students can lose interest if they do not have any visual aides to attract their attention. Telephones are also relatively impersonal, not being able to visualize a teacher or a classroom could impact a student's ability to successfully complete a course.

Teleconferencing technology and use is no different for an instructor or a student, both must call in the same manner, and thus incur the same learning curve. Ease of use and troubleshooting are generally the same for students and teachers.

Students and teachers can call into the class at no cost via a toll free number. Those with good internet connections can also connect to the teleconference by dialing in with a Voice Over IP program (VOIP, i.e. Skype, Google Chat, etc...). The teleconference operations for the entire University of Alaska system has been outsourced to a company which hosts the conferences outside of Alaska (Kowalski 2012). The cost of the toll free call is paid by the University of Alaska (Jones 2012).

### **Virtually a Classroom? Asynchronous Course Delivery**

The internet has tremendously changed education and delivery methods for both distance and classroom taught courses. The internet plays a number of roles in education including being a virtual library for audio, video, animation or text. For students it can also be used as a dictionary, calculator, translator, spell checker, tutor, mentor, or serve many millions of other purposes. With the mass proliferation of inexpensive personal computers and laptops in the past decade, along with the installation of telephone lines and fiber optic cables directly into residences and a growing mobile phone network, many rural Alaskans are now able to access the internet directly from home. That being said, the online experience for many of those users varies dramatically, generally depending on connection type, location, previous experience and computer equipment.

Asynchronous delivery of a course via the internet allows students to participate in a virtual class at their own pace, because there are no specific meeting times. The Center for Distance Education (CDE) at the University of Alaska Fairbanks has been offering online courses for more than a dozen years now and all of its 170+ courses are

available asynchronously (Gering 2012). One of the methods employed by the CDE uses a weekly deadline model to promote a cohort experience for students. All of the students in a class are required to work on the same portions of the course at during the same time and then the results of their work are peer reviewed. Carol Gering at CDE says that with asynchronous delivery the cohort experience is time shifted so the students can work at their own time, which can also be called near-synchronous (Gering 2012).

Asynchronous courses can be delivered through a number of web based technologies, including discussion boards, videos, audio, animations, social networks, web content management systems or blogs. Instructors in the UA system have used tools such as Google, Moodle, and Wordpress, however the primary course management system for the University is Blackboard (Kowalski 2012).

One major benefit of Asynchronous course delivery is that it generally requires less bandwidth so that most students who can connect to the internet in rural Alaska are capable accessing the data (Gering 2012).

Students with disabilities can also benefit from taking an asynchronously delivered course online because there are existing tools that can translate text into a different language, enlarge the size of the text on the screen making it easier for someone with poor vision to read, or even convert text into audio which for those students who have reading difficulties. Many technologies and websites in the UA system are being developed without the need for a traditional computer, meaning they can be accessed over a mobile phone or tablet device (Kowalski 2012).

Incorporating the mobility aspect into distance delivery can enable anytime, anywhere learning to take place (Kowalski 2012).

Many websites and online technologies tend to be easier for the students to learn than instructors, this is believed to be because of the typically younger generations acceptance and understanding of new technologies (Kowalski 2012). Online course development can be especially challenging if the instructor must develop or maintain a website. The CDE and the Office of Information Technology (OIT) in the UA system offer specialized training for instructors on developing online courses. There is very little formalized training available for students to use the online tools, that training is often left up to the instructor or the campus help desk (Kowalski 2012).

The costs of implementing, maintaining and upgrading the web based courses are almost entirely accrued by the wages of the person making or updating the site, the computers and the electricity used to power the server hosting it. The dramatic reduction in costs of computer storage and the small physical size of a website and text documents make it very cheap and easy to host an extremely large amount of websites and course materials from one central server. There are some significant costs that a student could incur by enrolling in a distance delivered course. Students who live in rural villages without a campus extension, or those students who cannot easily access their local campuses computer lab, must have their own computer and internet access. Internet access in rural Alaska is typically quite expensive and with very limited bandwidth, which causes a slow and sometimes unusable experience for the student.

### **The Virtual Classroom! Synchronous Course Delivery**

Synchronously delivered online courses are the closest thing to an actual classroom currently available for distance education (Jones 2012). There are a number of technologies that can be used for a real time, synchronous course, which can also be called a web-conference including Moodle and Openmeetings. The primary technology embraced by the UA system is called Elluminate Live also known as Elive (Kowalski 2012).

In a web-conference there is typically one moderator, often the instructor, who controls what data is presented on the screen. There a number of ways that students can participate in the course, in real time, including a chat window, verbally and even with video. With the moderator's approval, students can also manipulate what is on the screen so that there is a collaborative aspect to the materials. Web-conferencing programs are often able to incorporate many different types of documents and materials which can be presented simultaneously. This means that a teacher can present a text document, while verbally explaining the document. A student can then edit that same document, in real time in front of the class. This feature of web-conferencing allows for a more unified cohort experience and peer review which can enhance a students learning experience.

Web-conferencing requires considerably more bandwidth than asynchronously delivered courses, currently the largest limitation to full adoption is the lack of bandwidth available in many rural communities (Jones 2012). Initially many instructors were not interested in using E-live (Jones 2012) for a number of reasons, including

resistance to change, apprehension of new technologies, and the fact that students in many rural communities do not have the bandwidth necessary to successfully use it. For those and other reasons many instructors still refrain from using E-live for their courses.

The use of video conferencing has also been growing by leaps and bounds, with over 10,000 hours logged in the UA system in 2011 (Kowalski 2012). Video conferencing has many of the same limitations as web-conferencing because of the need for large bandwidth to stream a video in real time.

### **Logging Off: Conclusions**

While many of the tools remain the same, the methods for delivering a quality distance education have changed dramatically since the beginning. New studies are finding that there is a continually growing need for both synchronous and asynchronous Distance & Technology (D&T) education courses in rural Alaska. A poll conducted with distance students found that, because of jobs or children, approximately 95% said they couldn't attend a campus or online at any specific time (Gering 2012).

The amount of courses and sections offered at the University of Alaska through Distance and Technology is growing and increased from less than 2,500 in 2005 to nearly 3,500 in 2010 (Distance Education/Information Technology FY '05 - FY '10).

Recent reports prove that overall success rates are significantly increased when a student takes a distance delivered course. According to a report published by the University of Alaska, 30% of first-time freshmen in the UA System in 2006 that took at least 1 D&T course graduated with a degree or certificate by 2010. This is compared to 25% for those who did not take a D&T course (Distance Education/Information Technology FY '05 - FY '10). The course completion rate also increased by 8%, over a 10 year period, for students who enrolled in at least one D&T course compared with an increase of only 2 percent for students who did not take any D&T courses.

The number of male students enrolled in D&T classes continues to increase, however, in 2010 more than 64% of D&T students were female. While white students accounted for 69% of UA D&T classes, Alaska Native/Indian students made up approximately 16% of the D&T student body in 2010. The amount of Asian students enrolled in



distance courses at UA increased by 61 percent, to 561 students, between 2005 and 2010. During the same time period, the number of black students increased by more than 75%, to nearly 700 students (Distance Education/Information Technology FY '05 - FY '10).

More than half of D&T students with the University of Alaska are between 20 and 29 years of age, only 12% are under 20 years of age. 30 – 49 year old students make up almost 30% of the D&T student body, with 8% over 50 years of age (Distance Education/Information Technology FY '05 - FY '10).

The key issue in 2012 when talking about distance and technology delivered education is bandwidth, to maintain high quality access to remote areas is costly (Kowalski 2012). Because of a lack of a terrestrial network, the cost of satellite circuits is tremendous. For example, it's cheaper to provide a 45 megabit connection to a road system campus than a 5 megabit satellite connection to a rural campus (Kowalski 2012).

Along with getting high speed internet to a community, one of the other challenges for virtual learning in rural Alaska is the "last mile of internet", getting affordable high speed bandwidth internet into student's homes. Students could participate in many ways if they had the access, however scales of economy make it so that high bandwidth costs aren't supportable in rural Alaska (Kowalski 2012).

A student's educational experience will vary drastically depending on bandwidth accessibility. Also, Students often become frustrated if they have low bandwidth which causes a program to not work properly. When we overcome bandwidth we can overcome other limitations (Jones 2012).

Quality distance education is vital in rural Alaska because many people living in rural communities cannot get a post secondary education locally. As long as there are people living in remote locations around the largest state in the country, there will always be a need for distance education. Course delivery technologies that have been used for more than a century, like the mail, will probably not go away anytime soon. Newer technologies are vastly improving the quality of the instruction and providing a better educational experience for students. Once the connectivity limitations are overcome, I believe there will be a dramatically increased demand for distance education around the state.

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