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Distance Education in Nebraska: Access and Strategies

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Distance Education in Nebraska

Access and Strategies

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Introduction

As the fifteenth largest state, geographically, with the tenth smallest population, Nebraska faces many unique challenges. Sixty percent of the population resides in the eastern-third of the state while 33 of the 93 counties in Nebraska have a population of less than 5,000. One of the challenges facing such a geographically dispersed state is how to support educational and technological efforts that benefit all of its citizens.

Nebraska has been a leader in distance education. Nebraska became the first state to own its own satellite transponder in 1990. It supports public television and radio transmitters with digital transmission providing 28 channels of concurrent services. Nebraska Educational Telecommunications, known as NET, serves the State of Nebraska by offering 19 educational services using 13 different technologies. By the end of this century, more than 200 K-12 school districts will have interactive video classrooms (NET, 1998).

The purpose of this paper is to review the expectations of Nebraskans for lifelong learning opportunities and to review strategies to support the delivery of education and training throughout Nebraska. The paper is informed by results of formal surveys completed in late 1997 through the middle of 1998 (Nebraska Annual Social Indicators Survey, NASIS), and by documents related to this issue generated since 1995 (Aden, 1996; Anon. 1995a; Anon. 1995b; Anon. 1995c; Bateman, 1996; Bolen, 1996). The report "What the Public Wants from Higher Education" by Dillman *et al* (1995) is used often to serve as a basis for comparison to the nation as a whole.

The Bureau of Sociological Research conducted the Nebraska surveys as a joint effort of the Sociology Department of the University of Nebraska-Lincoln, the Institute of Agriculture and Natural Resources, and a variety of public agencies. Representative samples of Nebraska residents were interviewed by telephone about lifelong learning and other issues.

A series of questions determines whether Nebraska higher education institutions fulfill the educational and training needs of Nebraskans. Also investigated for this paper is whether the Nebraska's telecommunications infrastructure supports the needs and expectations of Nebraskans concerning education and

training. Another question determines support for lifelong learning among employers across Nebraska. Finally, the overall findings from Nebraska are compared with national data.

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Importance of Lifelong Learning to Nebraskans

It is clear that Nebraskans have views similar to those widely held throughout the United States. Eighty-two percent of Nebraskans feel getting a college degree is more important today than it was 10 years ago. Of those employed, 80% think that getting additional education and training is important for them to be successful at work compared to 81% nationally (Table 1). Sixty-three percent do not have a college degree. If anything, the youngest and the poorest Nebraskans place higher importance on earning a degree than just a decade ago.

Table 1. Importance of Lifelong Learning

Importance of a College Degree	**Nebraska (%)***	**National (%)****
More important	82.2	
About the same	14.0	
Education & Training Important to be Successful in Your Work		
Definitely yes	52	53
Probably yes	28	27
Pursued Additional Education or Training for Job or Career	46	80
Enroll in College Course - Next 3 Years		
Very likely	24	20
Somewhat likely	18	33

*Source: 1997 Nebraska Annual Social Indicators Survey, Bureau of Sociological Research, University of Nebraska-Lincoln

**Source: 1995 National Survey, Social and Economic Sciences Research Center, Washington State University

Nebraskans are not as likely to pursue education and training as are people nationwide. Only 43% of working Nebraskans indicated pursuing education or training during the past three years, and a similar percentage was somewhat or very likely to pursue training in the next three years. This compares to 80% of the public pursuing job-related education according to the national survey with 53% indicating they will enroll in college courses for credit during the next three years. We suspect that this reflects methodological rather than real differences.

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Support for Education and Training by Employers

Part of the reason Nebraskans may not be pursuing degrees is employers do not require degrees to enter the job market. According to working Nebraskans surveyed, only one-half of the employers have a minimum education requirement. Full-time employees reported a higher incidence of employers requiring some type of education or training than those working part-time. Fifty-two percent of those working full time reported a minimum education requirement for their jobs as opposed to 37% of those working part time identified a minimum requirement (Table 2).

Table 2. Education Requirements

Degree-Requirement	Full-Time	Part-Time
No Requirement	48	63
HS/GED	22	16
Tech/Associate	5	4
Bachelors	18	8
Masters	2	1
Doctorate	1	1
Other	5	8

Career changes do not require additional education or training by the majority of Nebraskans changing careers. Only 29% of those changing careers were required to have additional education. Forty-six percent did pursue education or training for their careers, however. Nebraskans just do not change careers that often (Figure 1). Although five respondents cited 25 changes in his/her career, the average change of careers among Nebraskans is two. The propensity to change careers increases as the level of dissatisfaction with an individual's fi-

nancial position. Still, only 30% of Nebraskans are considering a career change in the next three years (Appendices A, B, & C).

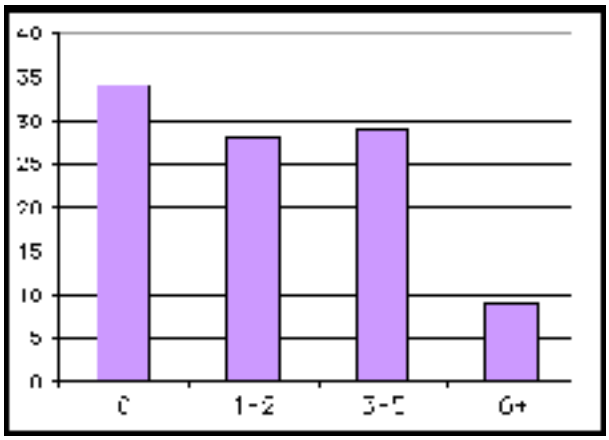

Figure 1. Number of Career Changes

Source: 1997 Nebraska Annual Social Indicators Survey

Bureau of Sociological Research, University of Nebraska, Lincoln

Employers reportedly are good about supporting additional education and training through financial assistance to employees. Seventy percent of the employers provide financial assistance to employees including both credit courses and noncredit type activities (Appendix D). The majority of employers support both credit and noncredit activities, and reimburse the total cost to the employee. A small percentage of employers base reimbursement upon the grade an employee receives when taking a credit course. Those working full time qualify for employer assistance program at a much greater rate (74%) than those who work part-time (44%) do. In addition, noncredit activities are more likely to be reimbursed for part-time workers than credit activities.

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Methods Used to Obtain Education and Training

When Nebraskans were asked specifically "have you obtained education or training for job skills or professional development," more than 4,400 responses were recorded (See Table 3). Seminars and conferences were the most frequent methods used by Nebraskans to obtain education and training, consistent with national data. Those who had experience with college courses used these more frequently. Those preferring credit courses over the other nine methods surveyed were individuals 19-24 earning less than $5,000 -- in other words, those

in school. Those with no college training preferred all methods except for Internet and a college credit course. (See Appendix E for a complete breakdown.)

Table 3. Methods Used to Obtain Education and Training

	Sem	**Conf**	**Video Tapes**	**Non-Cred Wkshp**	**Cred Crse**	**CD-ROM**	**Inter-net**	**Audio Tapes**	**Ind Study**	**TV**
Nebraska (%) *	56.1	43.9	39.3	36.6	27.3	25.1	22.3	17.2	15.4	14.6
National (%) **	55.0	40.0	33.0	43.0	30.0	31.0	NA	16.0	NA	11.0

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Barriers to the Public

When Nebraskans were asked whether barriers exist which prevent individuals from obtaining education and training, 75% chose not to participate in educational activities (Appendix F). Of the 25% who indicated barriers exist which prevent individuals from getting education and training, time and cost were the number one and two reasons listed (Figure 2). Females are more apt to experience barriers than males. Females cited that courses were not convenient as well as time and money as barriers.

Minorities saw more barriers than Caucasians with availability of courses and admissions requirements as the number one and two reasons for not participating in education and training. Age played a factor in barriers. As a person gets older, the barriers of time and money change to ones of admissions requirements and not feeling qualified to take college courses. Those without a high school diploma also cited admissions requirements and not feeling qualified to take college courses as the main barriers as well.

The unemployed and the disabled were split down the middle as to whether barriers exist. The unemployed overwhelmingly cited admissions requirements as the number one barrier as opposed to the disabled citing cost and not feeling qualified to take college courses. Others barriers cited were lack of child care available, health issues, and family commitments.

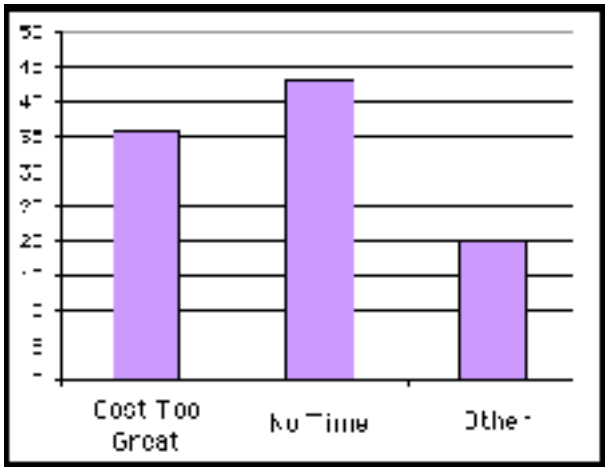

Figure 2. Barriers to Training

Source: 1997 Nebraska Annual Social Indicators Survey

Bureau of Sociological Research, University of Nebraska, Lincoln

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Distance Strategies and Teaching Methods

Keen contemporary interest in distance learning is based upon the fact that new delivery systems enable new approaches to instruction heretofore not possible (Brooks, 1997). In this article we divide strategies into two categories, synchronous and asynchronous.

Synchronous Methods

When the words "school" and "class" are used in conversations, they most often bring to mind mental images of rooms filled with chairs of some sort in which students meet with their teachers at one time. This model involves synchronous instruction - where the teaching is delivered at one time and place.

Early distance instruction involved teachers going to "remote" (i.e., off-campus) locations to provide synchronous instruction. For reasons of territoriality, off-campus instruction was handled by special units in colleges and universities, often under the heading of 'continuing studies.'

Early television approaches to distance learning tended to follow this model. In some cases, students gathered in rooms to hear replays of videotaped sessions. In others, distance learners received instruction at a scheduled time over the

airways. *Sunrise Semester*, SUN (State University of Nebraska), and UMA (University of Mid-America), involved largely synchronous instruction.

Much UNL-based distance learning today follows this model. Thus, several courses are offered by satellite instruction such that video images are exchanged between two or more sites where students meet at a common scheduled time. Often the instructor will broadcast from one or another of these various sites.

In the very near future, teachers will use synchronous instruction wherein the teacher and students remain in their homes or offices and use in-place, low-cost video imaging equipment to transmit images of themselves to the WWW. Each will receive images of others who, in traditional synchronous instruction, would have come together at the same time and place. Indeed, early work suggests that the sharing of such images is much less important than otherwise might be expected, but that sharing of common workspaces (whiteboards) is very useful.

For the most part, the methods available to instructors using synchronous teaching strategies are the same as those in traditional, on-campus instruction. Laboratory instruction and variations due to library access are the principal sources of distinction. A time limit is usually imposed for completion of work in synchronous courses.

Asynchronous Methods

Asynchronous instruction involves students working in a course in different places and at different times. Correspondence courses are among the primary examples of asynchronous instruction. These courses involve sharing of written materials, and often video- and/or audio tapes between teachers and their students. Assessments of student learning usually involve written examinations submitted via mail by the students, and sometimes involve oral examinations via telephone.

Although computer based instruction afforded opportunities to support asynchronous distance learning, these were never extremely popular. Costs, hardware availability, software dissemination, and platform compatibility issues often mitigated against this use. So, even though computer-based instruction is an older way of expressing what has come to be called multimedia instruction, impact prior to 1995 has been quite limited.

The advent of the Internet and, in particular, the WWW, suggests massive changes in the delivery of asynchronous instruction. In the United States today,

Internet access is essentially universal. Commerce and entertainment increasingly are provided through this medium. Personal computers are in over 50% of American homes, and these are becoming more and more commonplace and powerful. The U. S. Congress chose the Internet as the primary means of disseminating the "Starr Report" on Friday, September 11, 1998, which led to the busiest single day of Internet traffic up to that time.

One of the first Internet-based courses offered by UNL over the Internet was during the Spring Semester, 1995 [Liu *et al*, 1998]. This course used CD-ROM materials as the medium for content delivery, and a course listserv (a system whereby all class members could send e-mail automatically to all other class members) as the communication medium.

During the very recent past, the World Wide Web (WWW) has become the vehicle of choice for delivering asynchronous instruction. This vehicle supports an extremely wide range of multimedia formats. Most importantly, it support both methods for exchanging messages between and among class members, as well as automatic evaluation of selected student responses in two different ways. JavaScript is a scripting language that supports client-side interactivity - where the 'intelligence' of the interaction is transmitted over the WWW at the same time as the main body of information. Many strategies are used to support server-side interactivity where the end-user sends information to the server to be evaluated. The client software (Netscape *Navigator*, Microsoft *Internet Explorer*) has become rather standardized and runs about equally well on Macintosh and Windows 95 operating systems. Thus two early problems with such rich asynchronous instruction -platform incompatibility and lack of universal software -largely have been ameliorated. Access to commerce is a main driving force behind this Web standards, rather than an interest in supporting education or learning. There is one other major difference in this scheme of things. Today the consumers of education (the students) supply the hardware, the software, and the Internet access themselves. Issues related to Web-delivery have been described by Liu *et al* (1998).

Internet-based instructional activities are becoming widespread at UNL. These cover all kinds and manners of courses, disciplines, and strategies. There are examples of courses being shared between UNL and other universities (for example, a recent section of History 346 shared between UNL and the University of Colorado).

The impact of Web-delivered, automatic, repeatable testing as a means of supporting mastery-based learning has yet to be felt - but this looms on the horizon

as potentially the largest of all of the factors ever to impact upon asynchronous instruction.

Teachers are just now learning to teach using the WWW. For example, undergraduate and especially graduate instructors find the time they spend responding to e-mail to exceed greatly the amount of time previously spent in office hours or other outside-of-class-time teaching [Pence, 1998]. Access to materials is a major problem – with xerographic copies no longer being the medium of choice for dissemination of substantial if idiosyncratic portions of course content [Kilgore, 1998]. In some cases, drop rates rise markedly – as students find the asynchronous courses the easiest thing to 'squeeze' when they find themselves short on time, ending up with substantial deficits and too large a backlog to overcome [Liu et al, 1998]. Experience suggests that time limits be imposed for completion of work in asynchronous courses.

There are at least four major areas for concern.

1. Mechanisms by which faculty can learn about the new teaching strategies and issues brought about by Web-based asynchronous instruction are scattered at best.
2. Web-based components to conventional instruction are becoming important to the heart of college level teaching. The artificial administrative structures designed to deal with territorial issues (Divisions of Continuing Studies) are outmoded; these entities have outlived their administrative usefulness.
3. Ownership of courses in situations where Web-based delivery is involved is obscure. Teacher workloads are higher in courses with traditional writing requirements, so greatly enhanced faculty 'efficiency' is not likely to become an issue. However, this is a significant economic issue in courses where automatic testing can be employed. Also, copyright issues related to Web-based usage remain vague.
4. Issues of students' rights remain to be determined. Just what entitlements do students in these courses have from the providing institution?

All four areas of concern will impact on the strategies and methods used in asynchronous distance learning, but clear perceptions of these areas remain to emerge. A very recent dissertation (Betts, 1998) found similar results for faculty at George Washington University.

Nebraskan's Access

Synchronous distance education, as noted, is still place and time bound. Television-based instruction, for example, in synchronous mode would be very widely available. Over 70% of Nebraskans report having access to Cable TV, for example, while nearly 17% report having satellite dishes. Over 90% report having access to VCRs.

Asynchronous instruction, on the other hand, implies access to a different set of technologies. The cost of hardware seems to decline on a nearly continuous basis. For example, Apple Computer, Inc. recently released the iMac computer, a powerful standalone system with built-in 56K modem (and 10-100 base T ethernet) available for $1300. This price certainly will come down. Moreover, the current state of access in Nebraska is quite good. Fifty-two percent of Nebraskans report having home computer access, while 58% report workplace access. Of these, additional capability is reported in Table 4.

Table 4. Accessibility of Nebraskans to Computers.

	In the Home				**In the Workplace**		
	Win-95	CD-ROM	Modem	Internet Access	Win-95	CD-ROM	On-line Access
Percent	70.1	80.0	74.0	57.1	62.7	62.9	54.2

One concludes from Table 4 that over 25-30% of Nebraskans today have Internet access and would be candidates for participating in asynchronously delivered instruction. Clearly this represents a potential audience of such size that programming for this audience seems appropriate.

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The Public's View of Nebraska Educational Institutions

Educational institutions within Nebraska are highly regarded by Nebraskans. Eighty-two percent of Nebraskans felt their local school system was doing a fairly good or very good job. Eighty seven percent of Nebraskans felt the community colleges did an excellent-to-good job meeting the educational needs of residents, state colleges 89%, and the university system 92%. Private colleges received a rating of 91% in the same analysis (Appendix G).

When asked where they would take a college course for credit, Nebraskans chose community college over the four-year institutions. A community college

was chosen 55% of the time, while the university system ranked second with 31% . Individuals with a bachelors or graduate degree and those in-school preferred the university system (Appendix H).

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Telecommunications Infrastructure of Nebraska

In 1989, Nebraska invested $6.5 million to lease a satellite transponder with the intent to deliver educational programming across the state. This cost was actually lower than the cost of the previous system to maintain public educational television for the state. The Nebraska Educational Satellite Network (NEB*SAT) supports five networks utilized by a variety of educational institutions. Network I, better known as Nebraska ETV Network, is primarily a broadcast channel for public television and public radio. It is the Public Broadcast Service (PBS) affiliate for the state of Nebraska.

Besides general programming, Network I delivers Schools TeleLearning Service (STS) programming to the majority of elementary schools and nearly half of the secondary schools throughout Nebraska. During the school year, 25 hours per week is devoted to K-12 instructional programs. These programs are in cooperation with the Nebraska Department of Education (Ruggles, 1992).

Network I also broadcasts telecourses seven hours each week in cooperation with the Nebraska Educational Television Council for Higher Education (NETCHE). These pre-produced video series enable Nebraskans to enroll in college credit courses without spending a great deal of time on a campus. In addition, these telecourses often are used as integral parts of associate degree programs.

In 1994, NETCHE and several colleges and universities within Nebraska became part of a nationwide project known as *Going the Distance*. The goal of this initiative is to provide adult learners the ability to earn college degrees with limited time spent in traditional classrooms. The main delivery mechanism of this degree sequence is telecourses (Dubois, 1993). This national initiative provided an additional incentive for Nebraska's public and private higher education institutions to facilitate the transfer of Nebraskans from one institution to another. In November, 1995, 25 institutions signed an initiative to create a common core curriculum in general education. The initiative provides Nebraskans a smooth transition of at least 34 semester hours to minimize loss of time and credit when the public transfers among higher education institutions (Anon.,1995d). Finally, with 92% of Nebraskans having a VCR in their homes,

recording a telecourse for later viewing allows Nebraskans to overcome the barriers of time and place when obtaining education and training.

Network II provides educational institutions within Nebraska access to six digital channels dedicated to distance learning. These channels permit one-way video to over 300 sites (Figure 3) within Nebraska for educational and statewide programming. The interaction between student and instructor takes place either on an audio bridge over telephone lines or by telephone after the broadcast. Since its inauguration in 1990, use of Network II has gone from 624 hours per year to 5,203 hours for the fiscal year ending June 30, 1998. Channel capacity grew from one channel to five during the same period. Five of the six community colleges, all segments of the university system, and one private university used Network II for semester-long classes as well as *ad hoc* events.

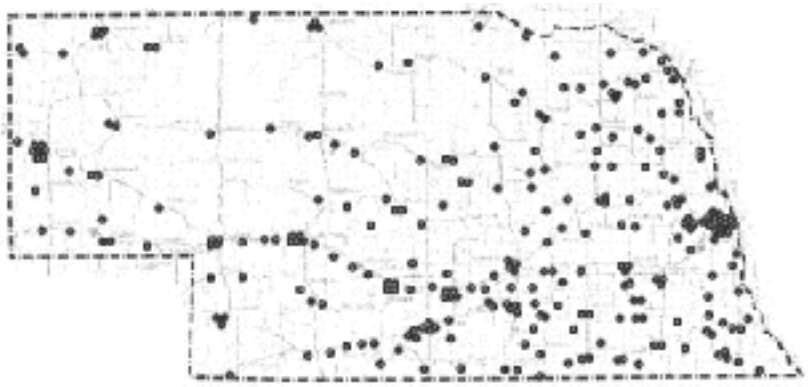

Figure 3. NET Network 2.

Network III allows for twenty-four one-way or twelve two-way (audio and video) interconnections among designated locations within the statewide system (Figure 4). In its first year, 1991-1992, Network III operated 2,793 hours of classes. This last fiscal year saw 22,966 hours of broadcast time for Network III. The availability of two-way interconnections have permitted varies institutions to collaborate in joint offerings. Examples of collaborative efforts include two community colleges jointly offering an associate degree and sharing instructors via satellite, two state colleges sharing foreign language classes, and a community college and a state college sharing a variety of offerings. In each of these cases, the student decides where to enroll.

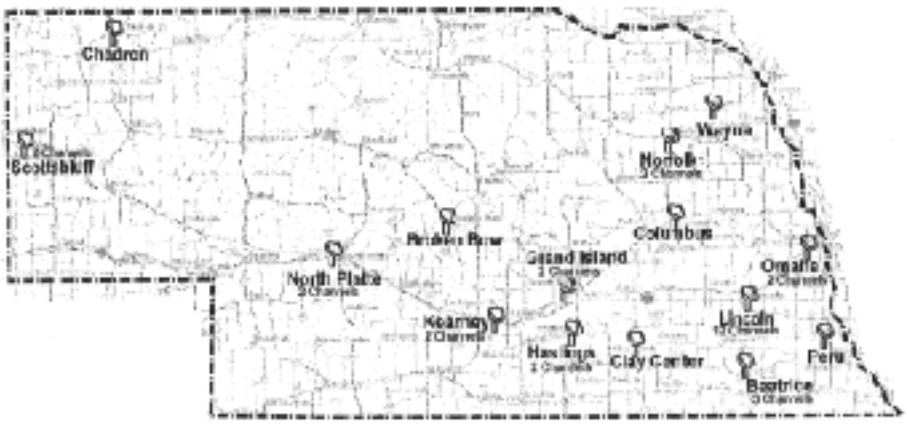

Figure 4. NET Network 3.

Network IV provides linkages via fiber or copper telephone lines to locations throughout Nebraska. The advantage of this system is multiple linkages can provide both video and audio to four sites simultaneously or all sites sequentially. Several regional projects serve primarily K-12 educational institutions.

The Nebraska Video Conferencing Network (NVCN, Figure 5) connects 20 locations for two-way video and audio delivered sequentially for meetings and educational purposes (Appendix I).

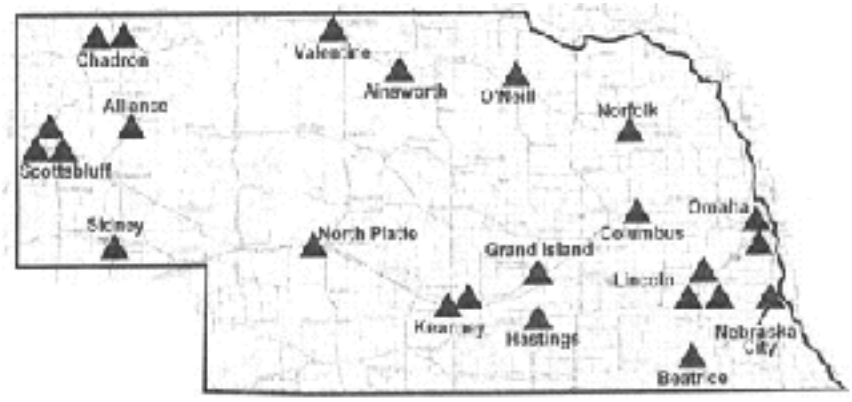

Figure 5. Nebraska Video Conferencing Network (NVCN)

Network V, known as Educable, is available in limited areas within Nebraska (Figure 6). This channel is available through cable access in 21 communities. Programming includes legislative hearings, rebroadcasts of ETV programs, telecourses, and a variety of lifelong learning programming.

Figure 6. Educable.

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