Attitudes Toward Computer-Mediated Distance Training

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Industry is demanding quality and relevant training, and is seeking new and more efficient ways to distribute training to its workers (VanBuren & Erskine, 2002). Many training programs require trainees to travel to the training location, with industry assuming much of the cost of room and board as well as transportation (Goldstein, 1997; Kasten, 1998). Training distributed at a distance can allow industry-training programs to reach more people while allowing the industry to save time and money. This study explored the attitudes of participants receiving training in industry through a means of computer-mediated distance training known as audiographics. Audiographics combines the use of voice transmission, computer networking, graphics, and data transmission through narrow-band telecommunications channels (Bradshaw & Desser, 1990; Summers, 1998).

The integration of distance education technologies provides a perfect forum for delivering training to industry. "Smart use of new training technologies will ensure that we continue to provide effective, high quality instruction and skills training while keeping costs down" (Pendaranda, 1995, p. 11). Computer-mediated distance delivery of training can allow professionals the training necessary to stay up-to-date in this ever-changing technical society without the expense of time, personal well-being, and money for travel to training locations.

According to VanBuren and Erskine (2002), total training expenditures in U.S. companies increased in 2000 and 2001 despite the slowing of economic growth and recession. Additionally, the majority of U.S. companies expect their training expenditures to increase rather than decrease in 2002. Furthermore, the use of outside training providers such as private consultants and educational institutions will increase (VanBuren & Erskine, 2002). Corporations can utilize distance education technology to distribute cost-effective and quality training to their employees. Because there is a need for constant upgrading and retraining knowledgeable employees (Kiplinger & Kiplinger, 1996), business will increase its role in education and training (VanBuren &

Erskine, 2002). Therefore, as the cost of training continues to rise, industry will require more cost effective ways to deliver instruction.

Distance Education and Distance Training

Forms of communication such as audio-, video-, and computer-conferencing have helped to make distance learning sophisticated, exciting, and efficient for the distance learner who is not actually in the physical presence of his or her trainer while learning. With these forms of communication the learner can be in the next building, at home, or in a place located hundreds of miles away (Duguet, 1995) and still access the training.

What is the difference between distance education and distance training? Devlin (1993) described the difference between distance education and distance training as follows: Distance education is typically student centered. Learners are encouraged and facilitated to pursue their own needs and preferences within the subject matter under study. Much of the literature defines distance education as learning that takes place when time and space separate student and teacher. Distance education is defined by the National Center for Education Statistics (1998) as "education or training courses delivered to remote (off-campus) locations via audio, video, or computer technologies" (p. 1). Correspondence courses are an example of distance education that has been available for many years.

Distance training, conversely, is driven and controlled principally by the needs of the organization. These needs, expressed simply, are to have effective, generally task-oriented skills acquired by trainees in the most cost-efficient manner possible. The role of defining the student's learning and competence needs is assumed by the organization (Devlin, 1993). Training involves a narrow focus aimed at specific skills and competencies. Typically, training goals are those of the organization rather than the personal goals of the individual (Chute, Thompson, & Hancock, 1999).

Distance Delivery Methods and Media

Of the two modes for delivering distance

training, synchronous instruction is when learners and instructors participate in instruction simultaneously and in "real time" (Steiner, 1995). Examples of synchronous instruction include interactive television, audio-conferencing, audiographics, teleconferencing, satellite conferencing, interactive relay chat (IRC), and multi-user object oriented (MOO).

Asynchronous instruction does not require simultaneous participation. Chute et al. (1999) defined asynchronous as "interaction between two or more people that is time-delayed, that is, separated by minutes, hours, or even days" (p. 219). Examples of the asynchronous delivery mode for delivering education at a distance include e-mail, videotaped courses, correspondence courses, and World Wide Web-based courses (Steiner, 1995).

Interaction among learners, between the learners and the content, and between the learners and the instructor is important to the learning process. Moore and Kearsley (1996) described three types of interaction to be included in a distance-training program: learner-content interaction, learner-instructor interaction, and learner-learner interaction. They stated that it is "most desirable for distance educators to use all three kinds of interaction" (p. 132). Hillman, Willis, and Gunawardena (1994) identified a fourth type of interaction not mentioned by Moore and Kearsley. Learner-interface interaction is "a process of manipulating tools to accomplish a task" (Hillman et al., 1994, p. 34). An appreciation for this type of interaction has become necessary because of the increasing use of high-technology communication systems in distance education. In other words, "the inability to interact successfully with the technology will inhibit his or her involvement in the educational transaction" (Hillman et al., 1994, p. 34).

Audiographics uses existing computer networks and telephone lines to deliver education and training to anyone on the computer network. This method of delivery is seen as more cost effective and practical than expensive videoconferencing. Freeman (1999) found that "the comparative costs associated with delivering graduate instruction via audiographics were calculated at less than 14% of the cost of satellite based instructional television" (p. iii).

Microsoft® NetMeeting, a commercial software application that can be used to deliver training by audiographics, includes audio, video, and whiteboard capabilities (Summers, 1998). NetMeeting allows instructors and students to login synchronously. The trainer can show a Microsoft® PowerPoint slide presentation from his or her computer to the class who can view the presentation whether or not they have the PowerPoint application available. The quality of the audio capabilities of NetMeeting can be problematic and is probably not adequate for use in all training situations (Summers, 1998). A conference call over a standard telephone line can be substituted for the audio capabilities of NetMeeting, successfully providing quality audio to all participants at multiple locations.

Attitudes

The majority of studies conducted on distance education and training compared to traditional education and training have found that there is no significant difference in achievement among learners (Freeman, 1999; Havice, 1999; McGreal, 1994; Ryan, 1996). The technology used for delivering the course is not the most important factor, but rather well-designed courses that are well delivered and conducted are important (Moore & Kearsley, 1996; Russell, 1999). Havice (1999) concluded in his study that "it is the method not the medium that influences the psychological processes that allow learning to take place" (p. 54).

There have only been a handful of studies comparing audiographics to traditional learning environments. Freeman (1999) found "no significant difference in the learning performance of any of the groups as measured by the cumulative course scores" (p. ii). Two other studies comparing traditional with audiographics delivery of courses also found no significant difference in the success of the students (McGreal, 1994; Ryan, 1996). Furthermore, Wisher and Curnow (1999) concluded that there is no training advantage to having a video image of the instructor.

Extensive research in the area of student attitudes towards televised courses has been done by Biner and his colleagues (Biner, 1993; Biner & Dean, 1995; Biner, Welsh, Barone, Summers, & Dean, 1997). They have suggested that attitude is as important as achievement to determine the effectiveness of a distance education program, and they express the importance for an ongoing plan of

attitudinal assessment. The conclusions of Biner et al. are further supported by Havice (1999), who noted that people pay attention to what they enjoy and that "information is retained when it is consistent with attitude and disregarded when it is in conflict with attitude" (p. 51). Therefore, high learner satisfaction with a distance training program can mean lower dropout rates, greater numbers of referrals to bring other learners into future programs, and higher levels of learner motivation and commitment to the program.

What We Did

The purpose of this study was to explore the attitudes of trainees who attended a customer service representative workshop through the use of audiographics in one of two locations. An experimental group (*n* = 20) received the graphic presentation through the Internet and Microsoft® NetMeeting projected onto a screen from one computer. The experimental group also received the audio through a standard telephone line and a speakerphone. The control group (*n* = 20) received on-site training face-to-face with the instructor. There were 20 participants in each group for a total of 40 subjects (*N* = 40) in the sample.

Research Question

The research question asked if there was a significant difference in attitude between those participants instructed through traditional training and those participants instructed through audiographics in a customer service workshop. A revised version of the Telecourse Evaluation Questionnaire (TEQ; Biner, 1993) was administered at the conclusion of the workshop to measure the participants' attitudes towards training delivered at a distance through audiographics.

The TEQ contains four sections. Section 1 contains 14 questions about instruction and instructor characteristics. Section 2 looks at technological characteristics with 7 questions, while Section 3 reviews course management and coordination with 5 questions. Section 4 asks for general course and demographic information. Each question 1 through 27 required a response on a 5-point Likert-type scale in which 1 = *very poor,* 2 = *poor,* 3 = *average,* 4 = *good,* and 5 = *very good*.

What We Learned

Technology provides a way to meet training needs by delivering low-cost, high-quality instruction. Several aspects of teletraining are very important, including upfront preparation of the program, along with allotting sufficient time and money for planning, design, materials preparation, and preproduction. Solid preparation, added to the right technology, results in training that is both instructionally sound and cost effective. No technology by itself will solve a problem or meet a training need. Training will not be effective, no matter what technology is used, without good instructional design (Pendaranda, 1995).

The resulting means for each question were addressed. For every question but one, the overall means and the means for each group were above the average score of 3. The mean score for the question concerning the audio quality from the control group was 2.47, while the mean score for the experimental group was 2.7, both below the average score of 3. Although high-quality speakerphones were used at each location to facilitate quality audio between the two groups, both groups rated the audio from participants at the other location as poor to average. All other aspects of the training were rated as above average to very good. Therefore, it can be inferred that overall, participants had very positive attitudes toward the delivery of the workshop.

On each question of the revised TEQ, *t* tests for independent means were performed (see Table 1). For every question, the critical value was greater than the observed value meaning. Therefore, the attitudes were the same for the control and experimental groups.

It was determined that the location of the speakerphones in the training room, the natural voices of the participants, and the other distractions in the room can affect the quality of the audio between training locations. It is recommended that the participants be seated around and close to the speakerphone and speakerphone remote antennae. Chute et al. (1999) wrote that audiographic equipment dictates the need for a conference table large enough for 14 people to sit around comfortably with room around the perimeter for additional chairs and equipment. Participants should also be encouraged to speak up and not mumble as they communicate with the other location.

Table 1. Means and *t* Values for Participant Attitudes

Question	Control	Experimental	Total	*t* value
1. Clarity of communication	4.20	4.33	4.26	0.60
2. Time graphics shown	3.70	4.10	3.90	0.15
3. Degree graphics helped	3.95	3.80	3.88	0.57
4. Quality of graphics	4.20	3.95	4.08	0.26
5. Help of instructor techniques	4.25	4.00	4.13	0.30
6. No environmental distractions	4.10	4.05	4.08	0.87
7. Extent you felt a part of the class	4.35	4.50	4.43	0.53
8. Instructor's communication	4.45	4.35	4.40	0.68
9. Instructor's class prep and organization	4.20	4.45	4.33	0.31
10. Instructor's enthusiasm	4.60	4.55	4.58	0.81
11. Instructor's teaching ability	4.50	4.45	4.48	0.82
12. Class participation encouraged	3.85	4.00	3.93	0.60
13. Instructor's professional behavior	4.70	4.55	4.63	0.43
14. Overall, the instructor was…	4.50	4.40	4.45	0.63
15. Quality of screen picture	4.30	3.50	3.90	0.01
16. Quality of instructor audio	4.55	3.70	4.13	0.00
17. Adequacy of screen size	4.50	4.25	4.38	0.27
18. Quality of participant audio	2.47	2.70	2.60	0.51
19. Brevity of talkback delay	3.77	4.21	4.00	0.05
20. Promptness of instructor answers	3.71	4.26	4.00	0.03
21. Confidence of no interruptions	3.37	3.85	3.62	0.12
22. Reaction of material exchange	3.80	4.10	3.95	0.27
23. Conscientiousness of site coordinator	4.05	4.45	4.25	0.06
24. Accessibility of site coordinator	4.11	4.60	4.36	0.01
25. Someone able to operate computer	3.75	4.55	4.15	0.00
26. Registration procedures	4.00	4.39	4.18	0.15
27. Overall, the course was…	4.05	4.15	4.10	0.75

Overall Participant Analysis of the Workshop

Overall, participants rated the workshop as above average to good (see Table 2). The majority of participants rated this workshop as about the same to a little better than conventional workshops they had taken. Thirty-six participants (*N* = 40) indicated that they would take another workshop delivered like this one. Four participants in the experimental group (*n* = 20) indicated that they would rather see the instructor.

Thirty-four of the participants (*N* = 40) indicated that they would recommend this workshop, while three participants at each location indicated that they would not recommend this workshop. Those participants who would not recommend this workshop gave the course an overall rating of average to poor and said that this course was the same as, worse, or much worse when compared to conventional workshops. Participants in the experimental group who would not recommend this workshop cited lack of visual contact with the instructor as a disadvantage of distance training and the cause for difficulty in concentration. They also recommended videoconferencing as an alternative. None of these participants would enroll in another workshop delivered like this one. The control group participants who would not recommend this workshop cited poor audio quality from the remote participants, less interactivity, and problems with the phone and computer as disadvantages of distance training.

Table 2. Overall Analysis from Participants

General Workshop Questions	Control	Experimental	Total
Overall, the course was…*	Good (4.05)	Good (4.15)	Good (4.1)
Compared to conventional courses, this course:*	Same as to better (3.6)	Same as (3.1)	Same as (3.35)
Would you enroll in another workshop delivered like this one?	Yes: 19**	Yes: 16 No: 4	Yes: 16 No: 4
Would you recommend this workshop to a friend?	Yes: 16 No: 4	Yes: 17 No: 3	Yes: 16 No: 4
Would you still have been able to attend this workshop if it had not been offered through distance training? (Experimental only)		Yes: 5 No: 15	
Including this course, how many courses taught at a distance have you taken to date?	1.35	1.25	1.3

* Scale 1 to 5.

** One person did not respond to this question.

Two of these control group participants indicated that they would enroll in another workshop delivered like this one, while the third did not answer the question. Fifteen of the participants in the experimental group ($n = 20$) indicated that they would not have been able to attend the workshop if they had had to travel.

What It Means

Findings from this study indicate that well-designed workshops, which foster positive attitudes among participants, can be delivered effectively through distance media. This supports studies done by Moore and Kearsley (1996) and Russell (1999). Using cost-efficient software, such as Microsoft® NetMeeting, in combination with high-quality instruction ensures that effective, low-cost instruction and skills training can be a reality. Audiographics is just one of the many ways that distance learning can touch the lives of many learners who because of time, money, and/or other commitments cannot devote the resources to attending on-site workshops, courses, or seminars.

Further studies would be useful in studying several facets of distance learning. These could include the following issues: rate of retention for participants in distance training, determining the effectiveness of audiographics versus video-conferencing, allowing a second remote site to see the instructor during the workshop, determining the effectiveness of different presentation methods, determining the relationship between prior exposure to distance training and attitudes towards computer-mediated distance training, determining the effectiveness of delivering the training directly to the workplace, and determining the effectiveness of a multiweek training course delivered at a distance through audiographics.

*For more information about the Telecourse Evaluation Questionnaire (TEQ), please contact Sally Cramer, EdD, at *sslcramer@earthlink.net.*

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