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Final Report
Preservation TrainNet

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(Revised March 31, 1999)

Executive Summary

Preservation TrainNet is a research project developed by the Master of Arts in Historic Preservation Program. Goucher College to test and evaluate the educational and cost effectiveness of a model on-line synchronous training program for members of historic preservation commissions. Preservation TrainNet consists of a notebook containing information useful to members of historic preservation commissions and a case study. The notebook formed the basis of three on-line classes. Each class consisting of six or *seven* students and a tutor and monitor. Extensive evaluations of the notebook and the on-line classes were also conducted as part of the project.

Students for Preservation TrainNet are members of historic preservation commissions located across the country. They were selected based on their length of service on commissions, familiarity with and access to appropriate Internet technology, and geographic distribution. Tutors and monitors were selected based on their experience with federal, state, and local preservation issues, teaching and training experience, and familiarity with Internet technology.

The Preservation TrainNet notebook contains original text augmented by appropriate publications from the National Park Service and National Trust for Historic Preservation. It was developed by the project director with advice and comment of the tutors and monitors. The on-tine pre-class classrooms and classrooms were developed by the Webmaster, Center for Graduate and Continuing Studies, Goucher College with technical support of the College's computer center. The asynchronous and synchronous classes used WebBoard software developed by Duke Engineering, discussion protocols developed by Goucher College, and NT servers located at Goucher, and at Interworks and O'Reilly & Associates, Atlanta, Georgia.

Two classes of six students and one of seven students were held on successive Saturdays in November 1 998. The size of the classes were limited to encourage interaction. Classes on different days was designed to accommodate participants schedules and also to help insure that possible technical problems did not compromise the entire project. Each class was assigned a tutor to guide the discussion and a monitor to record his or her thoughts on the class as well as to assist the tutor through WebBoard's whisper function.

All participants completed extensive evaluations comparing the on-line classroom educational experience to that of traditional classroom based training. Overall the students, monitors, and tutors thought that on-line training of members of historic preservation commissions had great potential once technical problems were solved and more people became comfortable with this method of training.

Introduction

The education and training of persons involved in historic preservation takes many forms. One can be self-taught through extensive reading, volunteer involvement hands-on rehabilitation of an historic building or in dozens of other ways. Another avenue for training and education is to enroll in one of hundreds of short-courses in historic preservation offered by training institutions, local, state federal governments, non-profit organizations, and colleges and universities. If a person is a member of a local historic preservation commission or design review board, he or she will have access to workshops and training sessions offered by State Historic Preservation Offices, the National Park Service, the National Alliance for Preservation Commissions, and other organizations.

While the possibilities for education and training in historic preservation may seem abundant, in reality they are severely limited by the time a person has to devote to education and the cost of attending traditional classroom or workshop based training and educational programs. The scope of the training problem for members *of* historic preservation commissions is particularly acute. The vast majority of members volunteer their time, and thus must take time away from their professional and family lives to attending on-site training programs. The number of commission members, currently estimated by the National Alliance for Preservation Commissions at over 15,000, is growing each year as more and more communities enact preservation ordinances to protect and enhance their cultural, architectural, and historical resources. However, the money available from federal, state, and local governments to train commission members has remained essentially flat for the past few years.

Preservation TrainNet was developed to test the educational and cost effectiveness of synchronous on-line training as a means of addressing some of these crucial educational issues facing members of historic preservation commissions. The target audience was selected because they are key partners in delivering preservation services and protecting historic resources in our nation's communities. The size of the audience, as well as its growth and turn-over wilt increasingly make the use of traditional on-site classes and workshops more costly and less able to reach all members of historic preservation commissions in a timely fashion.

Members of historic preservation commissions and their staff have a long list of training and educational needs. A sampling of the most important include:

- Understanding the purposes, philosophies and benefits of historic preservation;
- How preservation can be used to improve the quality of life, social conditions, and economic development potential of communities;
- How to identify, evaluate, and document historic properties and districts;
- Understanding designation procedures at the local, state and federal levels;

- Understanding local zoning, land use and building code regulations that affect historic resources;
- How to integrate historic preservation into local land use and comprehensive planning; and
- How to educate the public and elected officials of the benefits of historic preservation.

Distance Education and Training

In November 1993 a team of students at the National Center for Superconducting Applications at the University of Illinois released the first version of a user interface to take advantage of the "Internet" protocols developed a few months earlier by the CERN physics laboratory in Switzerland. Know as the "Mosaic" browser, it was commercially developed as Netscape Navigator and launched today's multi-billion dollar industry on the World Wide Web.[1]

In the seven short years since the internet was created, thousands of colleges, universities, government agencies, and non-profit organizations have developed information, training, and educational programs using the World Wide Web as the medium for communication. They have ranged from simply scanning static text onto web pages to interactive sound, text and animated images. In many cases lecture notes and other readings are simply placed on the Internet for remote access. In other cases, videotapes of professors' lectures are made available through college and university ethernets. Some faculty have designed courses that integrate lecture notes and readings with material freely available on the World Wide Web. In a few cases, the Internet has been used to bring together geographically diverse students and faculty for lectures and seminars.

While the World Wide Web has been heralded by many as the answer to education at a distance, surprisingly little research has been conducted into the cost and/or educational effectiveness of training via the Internet.[2] Much of the research that has been undertaken compares the performance of college-age students in a traditional classroom setting to students taking the same course on-line.[3] Very limited research has addressed training

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[1] Seigel, Martin and Sonny Kirkley. "Moving Toward the Digital Learning Environment: The Future of Web-Based Instruction" in Badrul H. Khan (ed). *Web-Based Instruction.* Englewood Cliffs, NJ: Educational Technology Publications. 1997.

[2] Reeves, Thomas C. and Patricia Reeves "Effective Dimensions of Interactive Learning on the World Wide Web" in Badrul H. Khan (ed). *Web-Based Instruction.*

[3] See for example David Finkelstein and Linda Dryden "Cultural Studies in Cyberspace: Teaching with new Technology" in *ALN Magazine,* Vol 2, Issue 2, October 1998 (on-line) and Lorena Ruberg, David Moore, and David Taylor "Student Participation, Interaction, and Regulation in a Computer-Mediated Communication Environment: A Qualitative Study" in *Journal of Educational*

and education of adults in non-academic settings.[4]

Despite the limited research, there appears to be consensus on the broad issues relevant to the effectiveness of distance training and education via the Internet or teleconferencing.

- Pedagogical issues related to the medium of communication. As with traditional classrooms, the medium of exchange effects information in myriad of ways. Teleconferencing, text-based and text, graphic and animated web-based communications all impose constraints as well as offer possibilities on the information that can be transmitted.

- Familiarity with the technology. The students and teachers familiarity with the technology (hardware and software) used to transmit information imposes constraints on learning. The more familiar they are with the technology, the less mental energy they need to expend to stay connected and the more they can devote to understanding the subject under discussion.

- Reliability of the technology. The more reliable the technology, the less frustrating the experience of training and education for both students and teachers.

- Feelings of isolation. Distance education often takes place asynchronously, allowing students to learn at their own pace and at the time of their own choosing. When synchronous learning does take place, the sense of isolation is less, but still apparent particularly in non-teleconference based distance learning environments.

- Quantity rather than quality of information. Currently, the World Wide Web has over 20 million sites covering every possible topic. In the next five years the at number is expected to grow to 200 million. If one uses one of the popular search engines to look for information in “historic preservation” today, over ten thousand sites will appear. This information overload is rapidly becoming overwhelming for users of the Internet.

- Organization of courses. Most on-line course simply reproduce materials developed for classroom based instruction or allow students to download assignments, readings and the like rather than pick up hard copies in class. Typically on-line classes are “taught” the same way they are in a classroom settings, the only difference being that students and teachers are in different locations. This duplication of course organization does not take advantage

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Computing Research, Vol. 14, No. 3, 1996.

[4] See *for* example Lesley Abbott, John Dallat, Robert Livingston, and Alan Robinson “The Application of Videoconferencing to the Advancement of Independent Group Learning for Professional Development” in *Educational and Training Technology International,* Vol 31, No 2, May *1994.*

of the interactive qualities of Internet technology as well as the independent nature of learning that the World Wide Web offers.

Perhaps most importantly, the use of the World Wide Web for education shifts the burden for learning from the teacher to the student.[5] In a traditional classroom setting the teacher is a teacher, dominating the conversation as well as serving as the primary interpreter of information. In an independent learning environment, the teacher's becomes a mentor or tutor, introducing students to sources of information as well as guiding their understanding of the class material. Thus the primary burden of learning shifts from the teacher to the student in a distance learning environment.

The experience of the distance learning programs at Goucher College[6] has shown that the best students are those that are seeking specific knowledge in particular areas, are self-motivated, and goal directed. Equally important is their ability to manage their time, plan ahead, and be flexible and resourcefully when problems arise. Similarly. Goucher's experience has shown that the best distance learning faculty members are those that recommend specific courses of action and provoke thought rather than those that provide answers. Equally important is the ability of faculty to set realistic goals and objectives.

Components of Preservation TrainNet

Preservation TrainNet consists of six major components: the Preservation TrainNet notebook, tutors and monitors, students, computer software, hardware and Internet connections, on-line asynchronous pre-class classrooms and synchronous classrooms, and evaluation of the educational and costs effectiveness of the project.

Preservation TrainNet Notebook

The Preservation TrainNet notebook was developed by the project director with assistance from the monitors and tutors.[7] It provided each student with a common basis of information that was drawn upon during the on-line classes. The 2 1/2 inch thick three-ring binder (see Attachment B) consisted of both original text and published information obtained from the National Trust for Historic Preservation and the National Park Service. Section 1 of the notebook describes how to participate in the on-line classes including

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[5] Relan, Anju and Bijan Gillani "Web-Based Instruction and the Traditional Classroom: Similarities and Differences" in Badrul H. Khan (ed) *Web-Based instruction.*

[6] Goucher College offers three distance education degree programs currently enrolling approximately 100 students: Master of Arts in Historic Preservation founded in 1995, Master of Fine Arts in Creative Non-Fiction founded in 1996, and Master of Arts in Arts Administration, founded in 1998.

[7] Due to budgetary constraints a traditional three-ring notebook was selected to be the primary method of delivering basis information necessary to participants in Preservation TrainNet. Additional funding *would* have allowed the development of on-line graphics, videos and other methods of delivering information electronically and non-statically to all participants.

instructions for logging-on, using the pre-class classrooms[8], posting messages, copying and pasting text and images, classroom protocols, using the menubar, refreshing the window, and obtaining technical assistance prior to and during the classes. Section 2 defined the purposes of TrainNet and its goals and objectives. Sections 3 through 9 contain basic information base for members of historic preservation commissions, including:

- Brief history of historic preservation in the United States;
- Overview of public agencies and non-profit organizations involved in historic preservation;
- Purposes of preserving cultural, architectural, and historic resources;
- How to identify, evaluate, and document historic resources;
- Procedures for historic preservation commissions;
- Planning, zoning, and building ordinances and codes and how they relate to historic preservation commissions and procedures;
- Comprehensive planning and managed change and how they relate to historic preservation commissions and procedures; and
- Educating members of the public, elected officials, and public sector staff about historic preservation, its benefits, and the work of the historic preservation commission and its procedures.

The final section of the Preservation TrainNet notebook contains a case study of a hypothetical town with a post-World War II suburb. It forms the basis of the an-line classroom discussion focusing on the preservation of the recent past. The case study is based on a Master's thesis recently completed at Goucher College by one of the monitors, with one of the tutors as her major professor.

Preservation TrainNet Tutors and Monitors

Three tutors were selected to conduct the on-line classes.[9] Each was paired with a monitor whose job was to follow the on-line conversations, recording impressions and

[8] Pre-class classrooms were developed for each class to allow participants to become familiar with WebBoard and to allow the tutors to post questions that would be considered during the on-line discussion. The pre-class classrooms were opened one week prior to each on-line session.

[9] Original four tutors and monitors were considered. However, due to difficulty in securing people with the right background and time to undertake the project, the number was reduced to three each. See Attachment A.

assisting the tutor as necessary through the whisper function of WebBoard.[10] The tutors and monitors were responsible for reviewing drafts of the notebook and making recommendations on the published material to be included. Tutors and monitors were selected by the project director based on their familiarity with historic preservation, local historic preservation commissions, teaching and training experience, and geographic diversity. One tutor and one monitor are employees of the National Park Service, located in the Heritage Preservation Services offices in Washington, DC. The second tutor is the Texas Certified Local Government coordinator located in Austin, and the third the city of Seattle's historic preservation officer. The second and third monitors are preservation! communication consultants located in the greater Washington, DC area. The tutors and monitors were paired based on background and availability during the three scheduled classes.

The tutors, monitors, project director. Webmaster, and technical support specialist participated in on-line training sessions held in October 1998. They were held to insure that the tutors and monitors were comfortable with the technical aspect of on-line discussions as well as to test the hardware and software. During the training sessions, it was concluded that pre-class classrooms should be opened to allow students to visit a simulated classroom to become familiar with the menubar and technical aspects of communication on-line. The pre-class classrooms also allowed tutors to post questions that they would be exploring during the synchronous classroom sessions, thus hopefully moving the pace of the conversation along.

Preservation TrainNet Students

A total of 24 students were selected by the project director to participate in Preservation TrainNet. All are members of historic preservation commissions. They were recruited through an announcement posted on the National Trust's *Preservation Forum* listserve, and at the 1998 annual meeting of the National Alliance of Preservation Commissions meeting in Denver.[11]

Students were selected based on the length of time they had been members of a historic preservation commission, recent attendance at a traditional on-site training session, and familiarity with and access to the Internet[12] Of the 32 applications received, eight were disqualified due to non-compliance with the technical aspects of the project. The remaining students were assigned to three classes, based on geographic distribution with

[10] The whisper function allows conversation between two participants without the dialogue appearing on all screens. Protocol established by Goucher College did not allow students to use this function, rather it was reserved for the project director, technical development and support personnel, tutors, and monitors.

[11] See Appendix One for a copy of the Call for Participants and Preservation TrainNet Application.

[12] Participants were required to have access to a PC with Netscape Internet Explorer 3.0 or higher and a minimum modem speed of 28.8.

an attempt made to distribute students from the same region in different classes to enrich the on-line discussion with. Four students dropped-out prior to their assigned class. One student's equipment failed immediately prior to class and was thus unable to participate.

Nineteen students ultimately participated in Preservation TrainNet. Five considered themselves to be very experienced in historic preservation, ten considered themselves to be somewhat experienced, and the remaining stated that they had little experience in the field. Half of the students had attended fewer than ten traditional on-site training programs in historic preservation. Most of these programs lasted an hour or two an covered only a single topic. Some were presented by consultants, others by local, state or federal government staff, and still others as part of state-wide or national preservation conferences. All but one had attended their most recent training session within the past 18 months.

Less than half of the students had been connected to the World Wide Web for three or more years, and only one had participated in more than five on-line chat-rooms. The majority had never participated in a chat room, and only one in an on-line training session. The most frequent use of the World Wide Web by students was to send and receive e-mail. A few used it for research on a fairly regular basis, while the majority only occasionally used the Internet in this capacity.

The majority of the students reported that they reviewed the notebook to some extent prior to participating in the on-line class. Of those that did, the majority described themselves as being very or somewhat familiar with the material covered. Eleven of the 1 9 students noted that they had technical difficulties during the class, the majority of which were quickly resolved by the student or by the technical support specialist at Goucher.[13]

Preservation TrainNet Hardware, Software, and Internet Connection

Preservation TrainNet utilized WebBoard, a software product developed by Duke Engineering to power the pre-class classrooms and on-line classes. It allows participants to engage in asynchronous and synchronous conversation, maintains a log of discussion, and has the capability to import graphics, text, and video into conversations. It also allows two or more individuals to chat without others in the room being aware of the conversation through its "whisper" function. This was used extensively by the tutors, mentors, project director, technical support specialist, and Webmaster during the classes to assist the tutor, track who was in the room, maintain the pre-determined schedule, and the like.

A URL was established at Goucher for the three classes and pre-class classrooms, each identified by the name of the tutor. Students were provided with the address via e-mail, along with brief instructions on how to log-on. This was supplemented with more complete instructions in the Preservation TrainNet notebook about how to use the various features of WebBoard (see Section One, Attachment B). In addition, all participants were

[13] For additional information, see Appendix Two: Participants Evaluation.

supplied with the telephone number of the technical support specialist for the project.[14]

The first class, held on November 7, utilized Goucher's NT server. Unfortunately, the protocol on the server and its heavy use kicked students, the tutor, monitor, project director, and technical support specialist out a number of times during the two hour session. In addition, the heavy traffic through the server sometimes caused long delay in posting of messages, slowing the conversation, and causing discussions to become disjointed. As reflected in the evaluations for this classroom, the need to re-entry the classroom and delay in posting were major sources of disappointment with the on-line training experience. Immediately after this class, the host server was moved to a commercial NT server located in Atlanta, Georgia. Operated by Interworks and O'Reilly & Associates, it also occasionally kicked students tutors and monitors out. However, this server proved to be much more reliable then the one used for the first class. In addition, the conversation through the Atlanta server occasionally slowed, presumably due to the traffic volume.

Preservation TrainNet Pre-Class Classrooms and Classes

Preservation TrainNet was not originally designed with pre-class classrooms. It was assumed that a sufficient number of historic preservation commission members who would be familiar with synchronous chat rooms. However this proved not to be the case.. In addition, the tutors and monitors recommended that pre-class classrooms be created so that they could post questions regarding the case study for students to consider prior to the classes. It was hoped that this would prepare the students for the issues to be discussed and thus help to move the conversations along quickly. The pre-class classrooms were created and opened one week prior to each on-line class. Students were notified of their address via e-mail. Most, but not all students, entered their assigned pre class classroom at least once, with the majority of those that did finding them to be very useful.

As originally designed Preservation TrainNet consisted of four classes each containing ten students, one tutor, and one monitor. For the reasons discussed above and in Attachment A. the number of classes was reduced from four to three and the number of students in each from ten to six or seven students. All classes still had a monitor and tutor. As discussed below, the smaller classes turned out to be considered by all a maximum desirable size, with some participants suggesting that even smaller classes would have been beneficial.

Classes were held on three successive Saturdays - November 7. 14, and 21, 1998- from 2 pm until 4 pm, Eastern time. Saturday afternoon were selected as most convenient to historic preservation commission members, the major of whom are employed full time. Early afternoon was selected to accommodate time zone differences across the country. Monitors and tutors entered the classes 1 5 to 20 minutes prior to their start to greet students as they entered, discuss any last minute educational and technical issues, and to

[14] Students were provided with a regular telephone number prior to their class. During the class, they were given a toll free number.

practice chatting and whispering with each other, the technical support specialist, and project director.

It took approximately ten minutes for most or all of the students to enter the classes.[15] The tutor then had each introduce his- or herself in alphabetical order and giving a brief summary of their community. This served not only to introduce the students to each other, but also reinforced classroom protocol described in the Preservation TrainNet notebook. Further, the introductions allowed students to become familiar with receiving and sending messages and other technical aspects of on-line communication.

Tutors next restated the questions they had posted in the pre-class classrooms. These served to focus the students' attention on those sections of the notebook that were to be most germane to the case study discussed later in the class. These pre-determined questions also served as springboards from issues for the students' communities related to topics under discussion. These latter questions allowed the students to directly apply the information in the Preservation TrainNet notebook and the discussion to familiar issues as well as share problems and issues with the class.

Approximately 1 1/2 hours after the classes began, the tutors instructed students to consider issues related to the case study and to post their thoughts at the end of the class. The classes concluded with the tutors thanking the students for attending and reminding them to send in their evaluations. To encourage further discussion as well as hopefully make the students more comfortable with on-line learning, the classrooms remained open an additional two weeks for asynchronous discussions.

Preservation TrainNet Evaluations

Each student, tutor, and monitor was asked to complete a 12-page evaluation describing their experience with Preservation TrainNet.[16] Students were asked to describe their background in preservation, on-site and on-line training, and familiarity with the World Wide Web. ln addition, they were asked questions related to their. preparation for the class including review of the Preservation TrainNet notebook, familiarity with the subjects covered, and use of the pre-class classroom. Additional questions focused on the tutors handling of the class discussion, technical difficulties experienced, and their thoughts on the educational value and quality of Preservation TrainNet.

Tutors and monitors were asked how long they had been using the Internet for e-mail, research and chat-room/teaching purposes, their recent background as teachers and instructors, training they received in conducting Preservation TrainNet on-line, use of the pre-class classroom, technical problems faced, and thoughts on the value and quality of the notebook and the on-line session.

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[15] It took approximately 30 minutes for the participants to enter the November 7 class due to technical problems with the server.

[16] See Appendix Two for a copy and summary of the Students (Participants) Evaluation and Appendix Three for a copy and summary of the Tutors and Monitors Evaluation.

Analysis of Preservation TrainNet

All students and five of the six tutors and monitors returned valid evaluations to the project director. The information from the evaluations was collected (see Appendices Two and Three) and analyzed by the project director. Because of the small number of participants involved in Preservation TrainNet, no statistical analysis of the evaluations was performed. Transcripts of the three classes were analyzed to determine quantitatively participation and interaction of students and tutors. Finally, the estimated costs of Preservation TrainNet training and traditional on-site training are compared.

Students Evaluations

All 19 students completed the evaluations forms. Most had substantial comments on the benefits and drawbacks associated with the sessions. Problems with the classes included technical difficulties, lack of on-line face-to-face interaction, size and scope of the notebook and a general discomfort with the form of communication. On the other hand, the students saw a number of benefits for on-line training, including not requiring travel and incurring time and financial costs, meeting people from commissions across the country, and being able to be in a small class rather than a large lecture. In addition, most students saw Preservation TrainNet as a way of bringing quality training to remote areas, praised the notebook as a comprehensive reference, and saw great potential for on-line training as a way to augment and enrich traditional training programs.

The most common complaints about Preservation TrainNet were technical difficulties, especially those encountered in the November 7 class. These ranged from being kicked out of the classroom by the servers, to the students unfamiliarity with the menubar and windows available in WebBoard. In addition, a number of students noted that the transmission time-delay experienced in all three classes resulted in portions of the conversations being disjointed.

The inability of seeing the tutor and other students face-to-face, a secondary but very important form of communication in traditional classrooms, was noted by many students as a drawback to on-line training. Further, some students noted that the interaction at coffee breaks and after-class sessions possible in traditional settings was impossible on line. A further drawback to on-line training was the relative slowness of typing rather than speaking. Some students also noted their general discomfort and unfamiliarity with computer-mediated communications as a problem. A few students were daunted by the size and scope of the Preservation TrainNet notebook, commenting that they did not have time to adequately review it prior to class.

Students also saw may benefits in Preservation TrainNet as well as great potential for on line training of members of historic preservation commissions. The majority mentioned that Preservation TrainNet was very cost effective in terms of money and time. The ability to communicate with members of other commissions from across the country, to exchange idea and discussion problems and solutions was seen as a benefit by many participants. The small size of the classes received positive marks as did the structure which maximized students' and not the tutor's participation. At the same time, the students appreciated

having a knowledgeable tutor in the classroom to guide the discussion as well as supply his or her expertise to the issues discussed. The ability of on-line training to quickly and inexpensively reach historic preservation commissioners in remote places was also noted as a major benefit, particularly those who were located in remote areas. In addition to some students being somewhat intimidated by the size of the Preservation TrainNet notebook, almost all thought that it was a excellent reference that would have served them better during the class if they had had time to read it thoroughly. Many also felt the notebook would continue to provide them with useful information for years to come.

When asked what they thought was the potential for on-tine training of members of historic preservation commissions, three thought that it had potential to be the primary means of training in the future, while 14 thought that it had potential to augment traditional on-site programs. Despite all the difficulties and drawbacks, only one student felt that on-line training had little potential as a means to train members of historic preservation commissions.

Tutors and Monitors Evaluations

Five of the six tutors and monitors submitted valid evaluations. Among the drawbacks to Preservation TrainNet they noted were technical difficulties, the lack of use of the pre-class classroom by the students, and slowness of typed communication.. In addition all noted that they were exhausted after the two hour on-line session. On the other hand, the tutors and monitors saw many benefits to on-line training including the ability to reach geographical diverse students, the small class sizes, the quality of the notebook, and the cost effectiveness of this form of training.

Similar to the students the tutors and monitors noted that the major drawback to Preservation TrainNet was the technical difficulties encountered in all three classes. especially in the first. Tutors and monitors also noted that the students did not seem to have taken full advantage of the pre-class classrooms to prepare for the questions that would be asked on-line. They also noted that many did not seem to be familiar with the menubar and its functions, initially at least, slowing the conversation. Similarly, the tutors and monitors noted the relative slowness of typing rather than speaking and the disjointed nature of some of the conversations due to transmission lag-time. All of the tutors commented that they were physically exhausted after their session, far more than they had every been after participating in a similar length on-site training program.

The tutors and monitors also had a number of positive comments on Preservation TrainNet and on-line training. They applauded the geographic diversity of the students because it enriched the conversation with examples from across the country. They also liked the small class size and the amount of participation by the students. Tutors and monitors were very complimentary on the notebook, seeing it a major reference for commission members in the future.

All rated the educational quality of Preservation TrainNet as satisfactory or very good, commenting that it could have been improved if more of the students had read the notebook thoroughly prior to class. One monitor noted that answers from students

showed that they were thinking and the format and size of classes did not allow anyone to sleep through class.

Two of the tutors and monitors felt that on-line training had the potential of becoming the primary method of training members of historic preservation commissions in the future, while three felt that it had potential to augment traditional training programs. One recommended that entire commissions be trained together and suggested that beginning, intermediate, and advanced level training programs be developed. Another recommended that quizzes and other means to reinforce the knowledge gained in the session be developed. Others suggested formats that would essential turn the model from a single session into a course. All felt that there was unexplored potential in using computer-mediated learning to train members of historic preservation commissions.

Participation and Interaction

One of the major drawbacks noted by students, tutors, and monitors to on-line communication was the slowness of discussion, caused by the need to type rather than speak as well as by the technology of the communication systems. This lead not only to frustrations, and in two cases boredom with the class.

Without testing, it is difficult to measure the level of learning achieved by Preservation TrainNet. However one can measure the quantity of communication by measuring the volume of words and messages exchanged. Further one can measure participation by calculating ratios between tutors' and students' words and messages. Using the transcripts of the classes, the chart on the page 14 was prepared, showing the participation and interaction in the classes. First the number of words typed by the participants was counted. Similarly, the number of separate messages was counted. Dividing the total number of words typed by the tutors and students respectively yielded their volume ratios. Similarly, the participation ratios of students and tutors was measured by dividing the total number of messages by those sent by each. Finally, the average number of words per message typed by the tutors and students was calculated.

As can be seen in the chart, collectively the students dominated the conversations. In addition, both students and tutors averaged approximately the same number of words per message. This strongly suggests that the students and tutors are much more equal participants in the exchange of information than is typically of a traditional on-site training program. It reinforces the role of the tutor as a guide to the discussion, rather that the provider of information. This is consistent with the findings of Ruberg, Moore. and Taylor in their study of student/teacher interaction in computer-mediated classrooms.[17] It also reflects comments made by students on the evaluations about the benefits of Preservation TrainNet that they were much more engaged in the conversation than they were during their most recent classroom-based training session.

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[17] Ruberg, Lorena, David Moore, and David Taylor. "Student Participation, Interaction, and Regulation in a Computer-Mediated Communication Environment: A Qualitative Study". *op. cit.*

Quantitative Description of Participation and Interaction

Total Number of Words Sent by Students	Total Number of Words Sent by Students and Tutor	Volume Ratio	Total Number of Messages Sent by Students	Total Number of Messages Sent by Students and tutor	Participation Ratio	Average Number of Words per Message Students	Average Number of Words per Message Tutor
November 7							
1281	2112	39% - Tutor 61% - Students	97	144	33% - Tutor 67% - Students	13.1	17.7
November 14							
2757	4856	43% - Tutor 57% - Students	191	265	28% - Tutor 72% - Students	14.4	28.2
November 21							
2973	4369	32% - Tutor 68% - Students	182	301	40% - Tutor 60% - Students	16.3	11.6
Totals							
7011	11,337	38% - Tutor 62% - Students	470	710	34% - tutor 66% - Students	15.0	16.7

Volume Ratio = Number of words sent divided by total number of words.
Participation Ratio = Number of messages sent divided by total number of messages.
Average Number of Words per Message Students or Tutor = Number of words sent divided by number of messages.

Cost Comparison

Applicants for Preservation TrainNet were asked the cost of the most recent traditional training program they had attended. Of the 24 applicants accepted, four did not know the cost of their latest classroom-based training session, noting that it was paid for by the local government. Of the remaining, four did not know the cost of registration, three did not know the cost of transportation[18], and only eight incurred lodging expenses. Most of the participants attended programs provided by the State Historic Preservation Offices, while *one* attended a National Park Service program and two the 1998 National Trust for Historic Preservation meeting in Savannah, GA.

Registration for the on-site programs ranged from $10 to $115 with an average of $49.50. Typically the shorter programs, ranging from 1 1/2 hours to one day were the least expensive, while the longer ones were the most expensive. Transportation was primarily by automobile, with one person flying to the site of the traditional training program. Costs ranged from $15 to $450, with an average transportation cost of $80. The majority of the traditional training programs were held close enough to participants homes so they did not incur lodging expenses. Of the eight that did, lodging cost from $0 to $300[19], with an average overnight expense of $58.50.

The total cost of recent traditional on-site training programs attended by applicants ranged from $20 to $820 exclusive *of* food and beverage, expenses. The average total cost for attending the programs was $188. Applicants received an average of 6.9 hours training, resulting in an average cost of $27.50 per person per hour.[20] It is important to note that these are direct costs associated with attending training session, not costs associated with developing and conducting the programs.

Cost of Traditional Training Programs

	Costs			
	Registration	Transportation	Lodging	Totals
Range(1,2)	$10-$115	$15-$450	$0-$300	$20-$820(1)
Average	$49.50	$80.00	$58.50	$188.00

1) Minimum and maximum for single individual reporting.
2) Cost of food not included.

[18] For the analysis, it was assumed that these students drove from their home town to the training site. Round trip mileage was calculated and multiplied by $0.32 per mile.

[19] The free lodging was for a participant who also was a speaker.

[20] Unless otherwise noted by applicants, one day's training was assumed to consist of 6 hours of classroom experience.

The cost of attending Preservation TrainNet is difficult to determine. Participants were permitted into the on-line classrooms and provided the Preservation TrainNet notebook at no cost. Nor did they incur travel, lodging, or food and beverage expenses. On the other, all participants need to have access to the Internet, the majority of whom did so through a commercial provider. Further, in order to participate, students needed appropriate hardware and software.

The overall budget for developing, conducting, and evaluating Preservation TrainNet was slightly more than $59,000 (see Attachment F). Of this, the vast majority ($54,400) can be assigned to developing the program, notebook and web-sites, and evaluating the results of the project. The balance ($4,600) can be assigned as the direct cost of the three on line sessions.

Direct Costs Assigned to On-line Sessions

Cost Item	Cost
Director 1 @ 6 hrs x $100/hr	**$600**
Webmaster 1 @ 6 hrs x $100/hr	**$600**
Tech. Support *1* @ 6 hrs x $50/hr	**$300**
Tutors 3 @ 6 hrs x $100/hr	**$600**
Monitors 3 @ 6 hrs x $100/hr	**$600**
Notebooks 19 for students plus 9 for staff @ $501	**$1,400**
Tech Support [21]	**$500**
Total	**$4,800**
Total divided by 19 students	**$242**

Assuming that the direct costs associated with the three on-line classes and pre-class classrooms serves as a proxy for the cost of Preservation TrainNet that can be compared to the on-site training program costs above, then the total cost of the training session was $4,600. Dividing this total by the 19 students yields a per person cost of $242, or $121 per person per hour for the two hour session. If the monitors. Webmaster, and project director are removed for the assigned cost base, the cost per student is reduced to $140 or $70 per person per hour.

[21] WebBoard ($460) a one time cost and NT server in Atlanta ($40/month).

On-Line and Traditional Cost Comparison

	Average Cost of Traditional Training Programs	Average Direct Cost of Preservation TrainNet	Average Adjusted Direct Cost of Preservation TrainNet
Cost to Participants	**$188**	**$0**	**$0**
Total Cost	**$188**	**$242**	**$140**
Cost per Hour per Person	**$27.50**	**$121**	**$70**

While the cost of the on-line session is considerable more than the cost of the traditional classroom based training program, the amount of interaction among students and faculty also is considerable higher than the average classroom based training program. The student/faculty ratio in Preservation TrainNet is much lower than in the typical on-site training program. Further, the dominance of student discussion, rather than faculty lecturing, in Preservation TrainNet is considerable greater than the average classroom based session (see chart, page 15).

Summary

Preservation TrainNet was too limited a project to definitively answer the research questions of the cost and educational effectiveness of synchronous on-line training programs for members of historic preservation commissions. Nonetheless it has demonstrated the financial and educational viability of this method of training, particularly for historic preservation commissions located in rural areas.

Factors critical to the success of this type of learning include selecting appropriate students and faculty, developing background and reference materials that students are required to study prior to holding the on-line training session, insuring that the technical support is available prior to and during all sessions, and limiting the scope and time of the synchronous session so that it is productive, but not exhausting.

Researchers and designers of future synchronous training programs for students similar in composition to those participating in Preservation TrainNet should consider the following to help insure the success of the training session.

- Participants should be screened for their ability to use, and comfort with, Internet chat rooms. Training sessions in the technical aspects of conversing through computers should be required for those with little or no experience.

- The reliability of servers and T1 connections and other hardware must be as close to perfect *as* possible.

- The educational objectives of each synchronous training session should be narrow and identified for all participants prior to the session. Students must be focused on those objectives throughout the session and not be allowed to engage in side conversations.

- Students must be required to use an asynchronous pre-class classroom as to study the material that will be covered in the on-line session as well as become familiar with the protocols of the classroom and Web-based tutorial system.

- Students should be required to study material distributed prior to the class. Graphics, keyed to the written text, should be distributed as CD-Roms or over the Internet as on-line graphics or video clips.

- On-line sessions should be a maximum of 90 minutes. Students entering late should be expected to catch-up on their own without interrupting the fold of the dialogue.

- Asynchronous classrooms should be maintained for two weeks or longer after the on-line class to encourage additional discussions among participants.

In addition, future researchers and designers of on-line training programs for historic preservation commissions and similar audiences should consider developing self-paced tutorials, including quizzes and other self-testing methods in various subjects.[22] Programs should be designed not only for the level of experience of students in historic preservation, but also level of experience in using the Internet. As Internet technology advances and the use of voice and real-time video becomes more available, consideration should be given to incorporating these mediums into the synchronous portions of future training programs.

Developing self-contained on-line training modules in various basic subjects that also provide local commissions. State Historic Preservation Offices, or others the ability to modify them to address local issues will help to localize the learning. This may be done by developing a series of outline “shells” each of which should be adapted to reflect local conditions, or through the use of local case studies to augment general discussions of issues.

Preservation TrainNet is the first attempt to use the Internet to train members of historic district commissions. Virtually no experience in this type of media exists within the preservation field. Very little experience in training over the Internet exists in other fields. As members of historic preservation commissions become more experience with using the Internet to communicate, and educators and trainers become more experienced in
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[22] See for example *Electronic Rehab,* a self-administered tutorial in the Secretary of the Interior’s Standards for Rehabilitation developed by the principal researcher for TrainNet and staff of the National Park Service, Division of Heritage Preservation Services (www2.cr.nps.gov/e-rehab).

appropriate use of the media to transmit information and knowledge, the educational quality of training will significantly increase while the cost of learning will significantly decrease.

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