

Digital Preservation Education: Educating or Networking?

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Abstract

Digital preservation training, especially continuing education, is now recognized as an essential component of an archivist's education. This paper reports on a research project that evaluated the effectiveness of continuing education experiences for increasing participants' skills in digital preservation and their ability to implement these skills in their repositories. The research project studied the impact of four workshops and five seminars in an international setting sponsored by the Electronic Resource Preservation and Access Network (ERPANET). The study findings indicate that the participants viewed the training events as successful, but that very few participants were able to implement the skills once they returned to their work environments. This paper analyzes the effectiveness of these kinds of training events and looks carefully at how they can be realistically measured.

Introduction

Organizations need to manage and preserve their digital resources because of the proliferation of digital materials for every type and form of information. To a much greater degree than with analog materials, digital information is dependent upon its technical environment, making its preservation particularly complex. Reading and understanding digital information requires hardware and software, both of which are constantly evolving and may become unavailable within a decade of their introduction. The rapid rate of change in the means of recording digital information, storage formats, and the technologies for use threaten the longevity of digital objects.

Although organizations are concerned for the longevity of digital resources and recognize the need to manage and preserve their digital resources, many organizations lack the requisite expertise. Currently, the demand for individuals skilled in the area of digital preservation greatly exceeds the supply. Margaret Hedstrom and Sheon Montgomery found in Research Libraries Group (RLG)

institutions that: "The lack of expertise in digital preservation appears to be a significant obstacle to developing digital preservation programs."¹ Further, because digital preservation strategies continue to evolve, training of those responsible for the care of digital records needs to be an ongoing commitment. Unless information professionals obtain and maintain practical skills and this knowledge gap is filled, any past investment in securing digital resources may cease to bear returns in the very near future.²

This paper reports on an independent research project that studied the effectiveness of four workshops and five seminars sponsored by the Electronic Resource Preservation and Access Network (ERPANET) for increasing skills for digital preservation in an international environment.³ ERPANET itself commissioned the study to "explore long term perceptions, take up of concepts and ideas, and the impact of ERPANET on practices" and to obtain "a very real indicator of the impact of the [ERPANET] project."⁴ In addition to assessing the impact of ERPANET workshops and seminars, this paper also looks to other examples of workshop education within the field for a general assessment of how to evaluate the outcomes of educational workshops in digital preservation.

The goals of ERPANET include serving as "a virtual clearinghouse and knowledge-base in the area of preservation of cultural heritage and scientific digital objects" and facilitating the exchange of "knowledge of state-of-the-art developments in digital preservation and the transfer of expertise among individuals and institutions."⁵ ERPANET organizes workshops and training seminars, and provides information on its Web site. It has held educational events on a variety of digital preservation topics, including the relationship between digitization, digital preservation, and conservation; XML for digital preservation; the long-term preservation of databases; trusted digital repositories; and audit and certification in digital preservation.

¹ Margaret Hedstrom and Sheon Montgomery, "Digital Preservation Needs and Requirements in RLG Member Institutions," *Research Libraries Group* (1998), at <http://www.rlg.org/preserv/digpres.html>.

² Neil Beagrie, "Towards a Digital Preservation Coalition in the UK," *Ariadne* 27 (2001), <http://www.Ariadne.ac.uk/issue27/digital-preservation/intro.html>.

³ ERPANET is a partnership between four institutions: The Humanities Advanced Technology and Information Institute (HATII), Nationaal Archief Van Nederland, Istituto di Studi per la Tutela dei Beni Archivistici e Librari, and the Schweizerisches Bundesarchiv. ERPANET is funded by the European Commission and Swiss Federal Government. As ERPANET's initial funding draws to a close it is important to determine the degree to which ERPANET's activities have fulfilled these goals. "ERPANET: aims and purpose," <http://www.erpanet.org>. For more information see Seamus Ross, "The Role of ERPANET in Supporting Digital Curation and Preservation in Europe," *D-Lib* 10 (July/August 2004), at <http://www.dlib.org/dlib/july04/ross/07ross.html>.

⁴ Seamus Ross, personal correspondence. Immediately after each workshop/seminar, ERPANET gathers feedback from participants, which it subsequently uses to improve future workshops/seminars. However, the evaluations conducted at the end of each event cannot provide an analysis of the overall impact of ERPANET's Web site, activities, and educational events.

⁵ ERPANET Web site, <http://www.erpanet.org>.

Literature Review

Information professionals have written about the need for digital preservation training and education, finding that few organizations offer such resources to the information community.⁶

Generally speaking, those educational opportunities available are offered by either postgraduate academic institutions or professional associations.⁷ Within the postgraduate academic institutions, the attention to digital preservation ranges from a full (elective) course on the topic to a course on electronic records with a two-week preservation unit. In Canada, at the professional association level, the demand for such specialized training appears to be too low to warrant repeated comprehensive workshops or seminars.⁸ However, in the United States, ongoing SAA workshops have been very successful in terms of attendance.⁹

Electronic records experts call for continuous training to keep up with the changing information landscape.¹⁰ It has been noted that the professional competencies for records managers and archivists have changed as a result of electronic records.¹¹ A survey carried out by the Digital Preservation Coalition (DPC) found a need for training in digital preservation;¹² currently, DPC is planning to undertake research in this area to determine what options are available. Past studies of digital preservation workshops and seminars have observed that raising awareness is key to increasing user competency.¹³ A study of the Association of Canadian Archivists' 2002 Institute conducted by Duff and Marshall found the participants were dissatisfied with the lack of practical information about electronic records preservation provided at the institute; however, this study also noted that attendees' awareness of the significance of digital preservation had increased after attending the training event. Overall, the findings supported the idea that increased awareness resulted in increased action

⁶ Resources available include on-line advisory resources provided by Cornell's Digital Imaging Tutorial, PADI, NARA, DPC, and JISC. On-line initiatives are disadvantaged because they do not include the peer exchanges that were so highly valued in previous workshops offered on digital preservation.

⁷ Amy Marshall and Wendy Duff, "Is Educating Archivists Enough?: Assessing the Impact of the ACA Institute 2002 Approaches to the Preservation of Electronic Records," *Preservation of Electronic Records: New Knowledge and Decision-making* (Canadian Conservation Institute, 2004).

⁸ Marshall and Duff, "Is Educating Archivists Enough?"

⁹ Society of American Archivists Web site, http://www.archivists.org/prof-education/course_catalog.asp.

¹⁰ Peter Horsman, "E-Term and Beyond: Project Overview," *Proceedings of the DLM Forum 2002*, http://europa.eu.int/historical_archives/dlm_forum/doc/dlm-proceed2002.pdf.

¹¹ Thijs Laeven, "Professional Competencies for Record-Keeping Staff," *Proceedings of the DLM Forum 2002*, http://europa.eu.int/historical_archives/dlm_forum/doc/dlm-proceed2002.pdf.

¹² Maggie Jones, "Digital Preservation Coalition," *RLG News* 8, no.1 (2004), http://www.rlg.org/preserv/diginews/v8_n1_feature2.html.

¹³ Marshall and Duff, "Is Educating Archivists Enough?"

and confidence in implementing programs; in addition, participants expressed satisfaction with the peer networking and sharing aspects of the seminar.¹⁴

Other examples of in-depth case studies provide insight into the difficulty of assessing the impact of training workshops. Richard Cox's doctoral dissertation analyzed the National Association of Government Archives and Records Administrators (NAGARA) Institute and evaluated its effectiveness in training government archivists to handle electronic records.¹⁵ His study is especially relevant to this paper because it looked at the effectiveness of training efforts beyond postsecondary education and was concerned as well with education about a comparably complex subject matter—management of electronic records. Participants who attended the first institute indicated that they wanted to achieve two things: “a statement of vision that could be used with staff, governing boards, and the public for their particular state to meet archival needs, and an outline of a model strategic plan that provided a proactive, participatory role for the state archives in the management of electronic records.”¹⁶ Cox concluded that neither objective was achieved in either the first or second institute. However, he asserts that the institutes were still somewhat successful in that they raised the awareness of participants about the potential problems of electronic records and began a process for managing electronic records, even if the full results were not achieved.¹⁷

Elizabeth Yakel and Jihyun Kim came to similar conclusions about the impact of training workshops in a study that assessed “diffusion and adoption of Encoded Archival Description (EAD)” after participants attended EAD workshops.¹⁸ The authors conclude that the majority of respondents to their post-workshop surveys had not adopted EAD. They further elaborate that the reasons for these findings are “an apparent size barrier, a lack of compatibility with existing descriptive practices, and the complexity of the technology.”¹⁹

The literature on Case Based Learning (CBL) is also relevant to this study, as the ERPANET event was designed to use it. CBL is a pedagogical response to complicated subjects and technologies.²⁰ In CBL, students are given a case or a

¹⁴ Marshall and Duff, “Is Educating Archivists Enough?”

¹⁵ Richard Cox, *Archivists, Electronic Records, and the Modern Information Age: re-examining archival institutions and education in the U.S. with specific attention to state archives and state archivists*, PhD diss., University of Pittsburgh (1992).

¹⁶ Cox, *Archivists, Electronic Records, and the Modern Information Age*.

¹⁷ Cox, *Archivists, Electronic Records and the Modern Information Age*.

¹⁸ Elizabeth Yakel and Jihyun Kim, “Adoption and Diffusion of Encoded Archival Description,” *Journal of the American Society for Information Science and Technology* 56, no.13 (2005).

¹⁹ Yakel and Kim, “Adoption and Diffusion.”

²⁰ Julie C. Kunselman and Katherine A. Johnson, “Using the Case Method to Facilitate Learning,” *College Teaching* 52, no. 3 (2004).

problem to solve before they are taught (or develop among themselves) the tools to solve the problem. This process has been shown to improve learning outcomes, including aiding students in moving from theoretical knowledge to applied expertise.²¹

Methodology

The research study described in this article employed both interviews and survey methods. The questionnaire (see appendix A) was sent to all individuals who registered for one or more of the nine workshops and seminars organized by ERPANET prior to January 2004. The semistructured interviews gathered data from eleven individuals who attended at least one workshop or seminar.

Questionnaire Methodology

To evaluate the success and effectiveness of the ERPANET workshops, we requested the participation of all registered attendees in completing an on-line questionnaire (see appendix A). Before contacting the participants, we administered the questionnaire to a small test group to ensure that it was clear and easy to use. Our test group suggested a few minor adjustments to the overall structure and wording of the questionnaire, and the revisions were subsequently made.

We first sent a letter to 405 people who had attended an ERPANET workshop explaining the research project and informing recipients that they would receive another letter requesting their participation within a week. The letter went by e-mail using a list²² compiled by ERPANET that reflected the registration for the workshops/seminars one day before the event. A second letter went out to 358 recipients (duplicates and incorrect e-mail addresses were removed from the first list) one week following the first contact.²³ We sent a third e-mail

²¹ J. N. Hudson and P. Buckley, "An Evaluation of Case-Based Teaching: evidence for continuing benefit and realization of aims," *Advances in Physiology Education* 28 (2004).

²² There is no way of verifying whether or not those on the list actually attended the workshops or seminars held by ERPANET. Moreover, it should be noted that the list included ERPANET staff members and several of the speakers, although not all of them. There is no obvious rationale for why some speakers and not others were included in the list. Response to the first letter included 26 e-mails that bounced back, 3 individuals who did not want to participate in the project, and 1 who said he or she did not attend the ERPANET workshops. One person emailed us to inform us that he had been a speaker at the seminar. Moreover, several duplicates were identified in the recipient database and were removed, making the number before the second letter was sent 358.

²³ The responses included 18 failed deliveries, 3 recipients who had registered but had not attended an ERPANET workshop or seminar, 4 out-of-office automatic replies, and a number of responses informing us that they had completed the questionnaire. In addition, we also revised our list to delete any participants who worked for ERPANET or attended the sessions as a speaker. In total, 19 individuals fell into this category and were removed from our list.

letter two weeks later, and again some bounced back and were removed from the list. At the end of the e-mail communications, 331 recipients remained in our study population. We cannot prove conclusively that this final population did not contain recipients who did not attend workshops, who were speakers or employees of ERPANET, or who did not remember the workshops they attended. Of the 331 prospective study participants, 120 individuals responded, leaving us with a response rate of 36.3%.

Interview Methodology

To improve our understanding of the results of the questionnaire, we also interviewed past attendees of ERPANET workshops. The interview process involved the administration of a short questionnaire regarding basic professional background information, the completion of a permission form, and a tape-recorded interview lasting approximately fifty minutes. Interviewees were offered an honorarium of about €20/£15 to thank them for their participation. The interview process was pretested in Toronto.

One of the researchers traveled to Vienna to attend the ERPANET event on File Formats for Digital Preservation, 10–11 May 2004, to interview participants who had attended a past ERPANET event. Prior to travel, an e-mail letter was sent to ERPANET contacts in Vienna and Rome, asking whether they would be willing to be interviewed. From this list of contacts, only 1 person agreed to be interviewed. However, at the Vienna workshop, a further 5 interview subjects were identified through an informal search for repeat attendees of ERPANET events, and face-to-face interviews were conducted with all 6 participants. The researchers later interviewed 2 more subjects who were attending a conference in Canada. Subsequently, we sent copies of the initial e-mail letter to past ERPANET attendees in Greece, the Netherlands, and the United Kingdom (78 in total), resulting in 3 further phone interviews. Thus, of the 11 interviewees, 4 were identified through e-mail contact, 5 through face-to-face introductions at the Vienna workshop, and 2 through existing personal contacts with the researchers.

We used a semistructured interview protocol with each interview lasting approximately fifty minutes. The interviews were audio recorded and later transcribed. Two of the researchers (Wendy Duff and Amy Marshall) separately analyzed and coded the transcriptions to identify emerging themes and concepts. NVIVO qualitative analysis software was then used to code the data and produce reports that were studied to identify broader concepts. These broad concepts were subsequently used to code the qualitative data from the questionnaire.

The Participants

Survey Participants

To put the results of the study into perspective, sections of both the questionnaire and interview were devoted to finding out information about our study population. In the questionnaire, section 4 was intended to gather information relating to the participants' backgrounds, the workshops they had attended, the types of material their organizations were responsible for preserving, the types of organizations they were affiliated with, and the staffing levels in archives, records management, and information technology in their institutions.

The survey results revealed that fewer than one-third of respondents (31.7%) were archivists, while 23.3% were information technology specialists. A further 17.5% of participants indicated that they were information professionals, 15% stated they were librarians, and 14.2% indicated that they were program managers.

When looking at the types of materials that organizations were responsible for preserving, it was clear that virtually all types of digital materials were represented in the survey group. The most common materials included databases (71 respondents), images (70 respondents), office documents (65 respondents), Web materials (58 respondents), audiovisual materials (49 respondents), e-mail (48 respondents), multimedia (48 respondents), and scientific data (32 respondents). Other materials, such as two- and three-dimensional modeling data, e-journals, scholarly communications, and GIS information and maps, were listed less frequently as digital materials to be preserved.

The questionnaire also aimed to identify the types of organizations for which individuals worked. The majority of respondents worked for public sector organizations (56%). Academic institutions employed the next largest number (33%). Less than 10% of respondents worked for a commercial company or consultancy organization. In addition to the categories in the survey, some participants indicated that they were employed by nongovernmental organizations, international organizations, cultural associations, and private institutions.

Interview Participants

Prior to beginning the interview, participants completed a short questionnaire about their background. None of the participants had formal training in digital preservation, although 8 of the 11 participants had formal education in information technology. The interviewees had varying degrees of professional experience.²⁴ Several of the participants had also attended various

²⁴ Four had less than 10 years experience in their current profession; 4 had 11 to 20 years; and the final 3 participants had 21 to 30 years of professional experience.

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ERPANET workshops or seminars in the past.²⁵ The participants generally indicated a long-term interest in digital preservation, with 1 participant indicating interest in the topic for more than 10 years; 4 others indicating interest for 6 to 10 years; a further 4 indicating interest that spanned 2 to 5 years, and 2 indicating interest in digital preservation for only 1 year.²⁶

Findings

The first section of the questionnaire focused on evaluating the ERPANET workshops and seminars that the participants had attended. Survey participants were asked to rate various aspects of the ERPANET event that they had attended on a scale of 1 to 5, with 1 being poor and 5 being excellent. Topics addressed in this section of the survey included the effectiveness of the speakers and teaching materials, the structure of the event, and how well the workshop addressed the main topic. Overall, the majority of respondents rated aspects of the workshop as being either good or excellent. Seventy-three percent (73%) of respondents rated the speakers as 4 (60%) or 5 (13%). Similarly, most respondents were quite content with the current structure of the program. Seventy-three percent (73%) of respondents rated the structure of the event as 4 (53%) or 5 (20%). However, the teaching materials were not rated as highly, with only 14% of respondents rating them as 5; 39% of respondents rating them as a 4; and 36% giving them a rating of only 3.

Survey participants also had an opportunity to identify the parts of the workshop or event they valued most. They often cited practical content as most relevant or useful, and many respondents indicated that this is what they expect from ERPANET events. Six respondents opined that the strength of the workshops/seminars is the broad range of topics they present. Overall, the survey revealed that participants valued the practical approach of the seminars, including working with each other in breakout groups to exchange information. In fact, the majority of participants felt that the most valuable aspect of the ERPANET series was the opportunity to learn from other attendees' personal experiences.

The interviews enabled us to delve deeper into both the value and shortcomings of ERPANET educational events. Again, the importance of getting information about the practical initiatives and the value of case studies was highlighted. Almost all interviewees valued hearing about the real-life experiences of colleagues working on digital preservation. One interview participant stated

²⁵ One participant having attended 6 to 10 workshops/seminars, 4 participants having attended 2 to 5 workshops/seminars, and 6 participants having attended only 1 workshop/seminar.

²⁶ Seven of the interviewees were male, and 4 were female. The age of the participants varied, with 4 being in the 26 to 35 category, 3 being in the 36 to 46 category, and 4 being in the 56 to 65 category.

that the workshops provided an opportunity to hear real-life experience, which was a refreshing change from academic conferences. This participant observed that the case studies revealed problems, shortcomings, and successes rather than trying to “sell” the virtues of a project, noting, “One has to look at it as useful to have other people’s evidence as to why certain things in certain circumstances are preferable to others.” Learning about real cases seems to have an effect on participants’ confidence levels: one interviewee mentioned that he or she had gained “confidence that we actually did know what was going on in the world, rather than the propaganda you often get on Web sites . . . [you get] some honest reflections on successes and failures in their programs.”

Liked Best, Liked Least

The questionnaire asked respondents what they liked best about the workshops and what they liked least. Fifteen of the respondents stated that the informal discussion with individuals who were facing similar problems, or the opportunity to network with colleagues, was the best feature of the workshops. Many of these networking opportunities took place in small breakout groups, and a further 5 respondents indicated that they liked the breakout groups best.

The importance of the networking aspects of the workshops was also highlighted in the interviews. One interviewee said, “I liked the most. . . that you can make very valuable contacts, which is absolutely necessary within the digital preservation area.” Some interviewees observed that the opportunity to network helped to ensure that the efforts of different professional communities in digital preservation were being coordinated, and one commented that the size of the events was optimal for networking: “It’s small enough to be intimate yet large enough. . . to have a good mix of people. To find a few people of one’s own mind to chat with.” Some participants discovered a feeling of community: several mentioned social programming as a valuable aspect of ERPANET events because it permitted professional networking to continue under more informal circumstances. Another person stated, “[Social events] were professionally fruitful, they were a good opportunity for more casual discussions.” One interviewee made use of contacts gained at a workshop when developing a metadata scheme for a long-term preservation strategy. Finally, a number of participants reported that they stayed in contact with people they had met at ERPANET events.

Both survey respondents and interviewees mentioned the value of having access to people from other disciplines and from other countries. The diversity of participants, enabling cross-cultural cooperation and communication, was seen as a positive aspect of the events. As one interviewee explained, “The workshop. . . was a very good mixture of people from other nationalities, not only from different kinds of institutions, but also from different countries, and different

experiences.” Respondents to the survey also highly valued the international and interdisciplinary nature of the workshops/seminars. Twelve respondents stated that they liked listening and talking to international experts, and a further 12 valued the diverse backgrounds of delegates and speakers.

The participation of colleagues from different professional fields—such as librarians, archivists, information technology specialists, and administrators—was frequently cited as an important factor in the learning that took place at ERPANET events, because of the interdisciplinary nature of digital preservation work. As one interviewee explained, “What I found really, really useful was the crossover between libraries and archives and to some extent museums. . . because I think that there are probably similar problems going on, but maybe being approached in different ways. So I thought that the cross-fertilization process was very good.”

The survey participants were also asked to indicate what they liked least about the ERPANET events. Thirteen respondents suggested that the breakout groups were problematic because the facilitators were “not chosen in advance,” the discussion was “unfocussed,” and their groups did not change so they were always meeting with the “same colleagues.” Another 14 respondents stated that specific papers or sessions were “too specific,” “too complex,” too “technical,” had too much “library content” or too much “archives content,” or were off topic.

The questionnaire also asked respondents to comment on what they would have liked the event to cover. From all the survey responses, two main themes stood out: a greater need for contextualization and a demand for practical information. One respondent commented that “a general introduction into digital preservation to place the topic of ‘metadata in preservation’ into context” would have been helpful. Another respondent echoed this view, stating that he or she would have liked “more [of a] mapping of where the world stands, as to the subject.” In addition to contextualization, many respondents felt that the program would have benefited by including more practical information and “specific examples about the topic.”²⁷ The need for more emphasis on tools for digital preservation was also noted.

Section 3 of the questionnaire was intended to measure what impact ERPANET events have had on survey participants. The participants were asked several questions related to their use of a variety of ERPANET resources following the event they attended. Several questions also focused on how information from the ERPANET session was communicated and utilized following the event.

Participants were asked if they have consulted the ERPANET Web site since attending the seminar/workshop. Eighty-one percent (81%) of participants reported in the affirmative. How often participants visited the Web site ranged

²⁷ It should be noted that respondents also liked the practical aspects of workshops best.

greatly. The vast majority of respondents visited the site monthly (38%) or less than once a month (52%). Only 10% visited the site daily or on a weekly basis.²⁸

The survey asked participants if they had made contact with ERPANET instructors since the event to discuss progress or directions. Only 8% reported that they had done so. Most postevent discussions focused on issues such as the preservation of electronic records, preservation policies, digital library systems, and metadata. All of the participants who contacted ERPANET instructors felt that their discussions were helpful to them in their work.

When asked to state the most valuable lesson that they took back to their institutions, respondents' answers varied greatly. For some participants (30, or one-quarter of respondents), the greatest lesson learned was practical in nature, such as different perspectives on the uses of XML, the need for digital preservation policies (14), the need to look into the OAIS model, and the importance of metadata in digital preservation. Through the ERPANET training events, several participants (7) recognized that long-term preservation of digital information is something that affects us all and that there is a need to work together to find solutions. There was a general recognition that digital preservation is very complex, but that it is something that is possible to do if we "stick together and share our knowledge." For several participants (7), hearing about the experiences of other institutions affirmed some of the decisions that they had made in their own institutions.

Participants were also asked if they had shared any of the information from the workshop or seminar with their institution, and an overwhelming majority (96%) had. Eighty-six percent (86%) of participants shared the information in an informal manner, while 40% did so formally within their institution.

The interviews clarified the types of information the participants shared. Many participants described ways they had disseminated information acquired at ERPANET events to colleagues at their place of work, including writing formal reports. Some information sharing was less formal, occurring in the course of routine communications; as one interview participant noted, "[The] next day. . . I discussed with colleagues what I have learned, or when I emailed to somebody I came to know at the workshops." Another interviewee described sharing workshop materials and recounting information from the event with his or her staff, who were at that time involved in developing digital preservation strategies for a new repository. In this case, the dissemination of information prompted the staff member to conduct further research on these topics. Finally, another interviewee invited contacts from an ERPANET workshop to a subsequent workshop hosted by his or her organization, continuing to explore the ideas encountered at the session.

²⁸ The most frequently used resources on the ERPANET Web site are *erpaStudies* (73%), *erpaTopic* (55%), and *erpaTools* (45%). Sections of the Web site used less frequently were the *erpaAdvisory* (20%), *erpaAssessments* (20%), and *erpaCharter* (11%).

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When asked if they had used any of the information from the event, 68% of respondents stated that they had. Some respondents used the information in creating policies, procedures, and guidelines in their institutions. Others used the information to support, improve the workflow of, and make recommendations related to digitization projects. Some participants used the information to support their teaching, both formally and informally, within their institutions. Several others referred to using models, such as the OAIS model, in their digital repository implementation plans.

Despite the high reported use of information from the ERPANET workshops, only 35% of respondents said that they implemented the ideas that they learned about at the event. This was also reflected in the lack of changes participants made to institutional policies and procedures. For example, very few survey respondents stated that the knowledge they gained from the ERPANET workshop/seminar led to a change in policies, strategies, or practices in their institution. Eighty-three percent (83%) of respondents claimed that their organizations had not changed their policies or practices because of the knowledge they had gained from the workshop. However, many organizations already had policies in place before staff attended the ERPANET events. Sixty-eight percent (68%) of survey participants claimed that their institutions had policies and/or strategies related to the preservation of digital information. Fifty-four percent (54%) of respondents reported that their institutions had selection and retention policies pertaining to digital information. Only 19% of respondents had no policies in place to deal with digital information.

When asked if their personal interest in digital preservation changed since attending the workshop/seminar, only 37% of survey respondents reported that it had. However, of them, an overwhelming 96% felt that their interest in digital preservation had increased since the event. Respondents identified several reasons for this. Many felt that they now had a greater knowledge and awareness of the issues and complexity surrounding digital preservation. One respondent stated, "Before the event, I didn't realize the importance of the topic." Some respondents felt that the workshops/seminars gave them confidence to find solutions to the problems surrounding digital preservation. Some interviewees felt that the way they work, or the products of their work, had changed as a result of an ERPANET event: "...The decisions we are making are better informed than they would have been, thanks to the exposure to sources we probably wouldn't have come across otherwise. The end product or end strategy that we formulate will be different than it would have been otherwise." Others stated that their interest in digital preservation had increased because they were able to get an international overview of preservation issues. On the same topic, however, a number of participants observed that the field of digital preservation is rapidly evolving. Therefore, although they felt their organizations and modes of working had changed since their attendance at an ERPANET event, they were not sure such change was a direct result of their attendance.

When asked if their confidence level, in terms of digital preservation, had changed since the workshop/seminar, 59% of survey respondents said it had. All respondents stated that their confidence level in dealing with digital preservation issues had increased since the workshop. Respondents gave several reasons for the changes in their confidence level. Some respondents stated that they have become more confident because they have a greater understanding of the solutions to preservation problems. Others stated that they are more confident now because they realize that other institutions face the same problems that they face. Some respondents felt that they are more confident because the workshop gave them a basic framework to help their institution to make decisions about long-term preservation. One interviewee noted, "I have been more confident. . . because you know that other people have the same problems so you can see that. . . you're not alone with the solutions."

Some interviewees said that they felt more reassured about digital preservation as a result of attending an ERPANET event and knowing that they can get information from the ERPANET Web site: "I am more reassured. . . I know where to get information, that's important. And one of the main things is I know where to get most of the information, if we need that, on the ERPANET Web site." The value of ERPANET documentation was identified as a benefit of the workshops.²⁹ Many interviewees said they have retained materials from ERPANET events and that they continue to refer to them, or to refer to less tangible resources such as contacts and new knowledge of relevant initiatives at other institutions. Others commented that the materials they kept from ERPANET directly relate to their current work and are a repeated source of information for them: "I've certainly used a number of ideas from ERPANET presentations to carry through some ideas for things we're implementing ourselves."

Conclusions

Participants found ERPANET workshops and seminars valuable, and they disseminate information they learned to others, spreading awareness of the issues and increasing user knowledge. In addition, the information provided through ERPANET events is being actively used. Information is being used cross-institutionally, at educational centers, and among professionals, some of whom are initiating other seminars. Participants identified the practical components of the seminars as being particularly valuable. The findings of this study support those of Marshall and Duff, who said that workshops on digital

²⁹ However, as previously noted, the usefulness of the documentation was not rated as highly as the speakers or the structure of the workshops, and the majority of respondents (52%) indicated they visited the Web site less than once a month.

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preservation build confidence.³⁰ Moreover, our results show that attendees feel that the case studies and exchanges with other participants are key to the overall success of the events; face-to-face networking is important because it increases confidence levels.

We can conclude that the ERPANET workshops are meeting their goals. The participants expressed satisfaction overall with the content and structure of the events. Networking, increasing confidence levels, and future collaboration were identified as important benefits of the workshops. The breakout groups yield potential for great success, offering participants the much-acknowledged opportunity to exchange with colleagues and learn from practical experiences; however, these groups have to be carefully managed to facilitate the different stages of expertise.

The findings from this study suggest methods and techniques that should be considered in the delivery of future digital preservation conferences. First, our research highlights the importance of face-to-face sessions held over a number of days with numerous social events. Participants learn both in the formal presentations and in the informal discussions. Participants learn from each other and gain a great deal of confidence from being part of a digital community and knowing that others share their concerns and problems. Many information professionals need a basic introduction to these issues, and they need a nonthreatening setting where they can discuss the problems they are facing in their workplaces. Participants particularly value workshops that include professionals from various disciplines. A series of workshops would provide such a setting, especially if it contained small, well-organized breakout groups. Very small groups that reflect various abilities would facilitate the sharing that takes place in the breakout sessions. Furthermore, internship or exchange opportunities that enable professionals to visit other institutions and work with related information professions would provide valuable learning experiences.

Second, our results showed that participants value the case-based approach, which uses case studies and real-life examples of digital preservation strategies, programs, and policies. Research on case-based education indicates that this approach can help students understand abstract theoretical concepts by tying them to practical examples. The value of case-based learning is being promoted by many professional programs. For example, the University of Toronto's Faculty of Information Studies has decided to "introduce problem-centred learning" as a general pedagogical style—initially in electives or pilot versions of core and required courses; then, as experience is gained and bugs worked out, across the curriculum as a whole:

Problem-centred learning is especially appropriate in a professional faculty, for a number of reasons: (i) it maintains an emphasis on concrete situations,

³⁰ Marshall and Duff, "Is Educating Archivists Enough?"

appropriate for both professional education and for empirical research; and (ii) it facilitates inter- and multidisciplinary teaching by allowing faculty to bring diverse methods and approaches to bear on common problems—improving education and student experience.³¹

Therefore, one would assume that workshops and other educational events should ensure that practical content receives emphasis. However, we need robust, well-tested case studies to use in our educational venues. The InterPARES project³² and ERPANET developed a number of cases, but their value as educational tools have yet to be tested. Furthermore, we need a mechanism to ensure these cases remain up-to-date. Digital preservation is a rapidly evolving field and organizational situations and technology can change dramatically in only a few years. Therefore, we need to develop a repository of open-ended cases that pose concrete problems facing organizations involved in preserving digital resources. Updated annually, these cases would provide a valuable resource for training students of digital preservation in both the university and the workshop setting. Naturally, these cases should be tested and evaluated to determine how they could best be used within the teaching environment.

Between 1996 and 1998, SAA commissioned a set of eight cases on the management of electronic records. Each case included the description of the particular case, a number of questions to be answered, and a teaching guide. The use and value of these cases have not been studied. Research to examine the impact of these cases and identify both their strengths and weaknesses would facilitate the development of a new set of cases on digital preservation. Training events need to provide participants with practical ideas that they can take back to their institutions. However, it is not clear how best to do this when there are few concrete, simple solutions to alleviate their preservation problems.

Third, not only does the study point to the importance of postevaluation of training events, it also raises questions about how to evaluate the impact of these events. This research, as well as studies by Cox, Marshall and Duff, and Yakel, suggests that workshop participants do not necessarily return to their organizations and implement workshop content. If implementation of ideas is not the achievable goal, then what is the value of these training events? Is awareness and increased confidence enough, or does lack of implementation raise questions about the value of these events? Making workshop participants aware of issues and giving them increased confidence to deal with these issues seem

³¹ Faculty of Information Studies Academic Plan, <http://www.fis.utoronto.ca/activities/planning/FISAcademicPlan.pdf>.

³² The InterPARES (International Research on Permanent Authentic Records in Electronic Systems) Project is a major international research initiative in which archival scholars, computer engineering scholars, national archival institutions, and private industry representatives are collaborating to develop the theoretical and methodological knowledge required for the long-term preservation of the authenticity of records created in electronic systems. The InterPARES Project is based in the School of Library, Archival and Information Studies at the University of British Columbia, <http://www.interpares.org>.

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worthwhile results for a two-day workshop, but the successful preservation of digital resources requires the actual implementation of relevant policies and procedures by parent organizations.

Perhaps two-day workshops are only capable of raising awareness and confidence in this area. Digital preservation is an extremely complex, evolving field that requires a great deal of knowledge to understand. In-depth courses taken over a series of weeks or months, or internships with institutions with robust digital preservation programs might be more effective in training individuals to deal with digital preservation problems.

Perhaps the most important question is how can we measure the true impact of education? This study used a questionnaire with respondents personally assessing their level of confidence, the degree to which they shared information, and the ideas that were implemented. Would a more intensive study that assessed participants' knowledge before and after an event provide a better measure of impact? Would reviewing an organization's policies and procedures before and after their employees attend a number of training events provide valuable insight? Identifying realistic outcomes for educational events, evaluating these events to gauge their success in achieving them, and determining the reasons for such success, or failure, are essential if we are to develop the appropriate training events for archivists, librarians, and information technologists dealing with digital material.

Even though we have many unanswered questions, we think the ERPANET training events provided valuable learning experiences for many of the participants. They gained awareness about the importance of digital preservation, were able to identify the key issues concerning digital preservation, and acquired the confidence necessary to tackle some of the problems on their own. However, these individuals need to have access to other training experiences to keep up with the fast pace of digital technologies and the ever-increasing need for preservation.

Appendix A**Digital Preservation Education: An Evaluation of the Workshop(s) and/or Seminar(s) Organized by the Electronic Resource Preservation and Access Network (ERPANET).****Questionnaire****Section 1: Re-evaluating the Workshop(s)/Seminar(s)****1.0 Which ERPANET workshops and seminars did you attend? (Tick all that apply)**

Seminars	Workshops
<input type="checkbox"/> Copenhagen	<input type="checkbox"/> Toledo
<input type="checkbox"/> Paris	<input type="checkbox"/> Urbino
<input type="checkbox"/> Kerkira	<input type="checkbox"/> Bern
<input type="checkbox"/> Marburg	<input type="checkbox"/> Roma
<input type="checkbox"/> Lisboa	

The following questions in this section mirror questions on the course evaluation conducted at the conclusion of the workshops/seminars, in order to evaluate perception of the workshop(s)/seminar(s) over time. This section is repeatable. If you attended only one workshop/seminar answer the questions in section 1.1. If you attended more than one workshop/seminar, answer the questions section 1.1 about the first workshop you attended. Then answer the questions in section 1.2 about the second workshop/seminar you attended.

Section 1.1 The first ERPANET workshop/seminar you attended**1.1.1 Please indicate the subject of the first ERPANET workshop/seminar you attended.**

1.1.2 What motivated you to attend the workshop/seminar? (Tick all that apply)

- Interest in the topic
- Interest in the ERPANET Project
- General interest in preservation activities
- Location
- Speakers
- Other, please specify _____

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Please rate the following by circling the numbers below, using **1 = poor and 5 = excellent**. If you would like to make specific comments, please note below.

1.1.3 How effective were the speakers?

1 2 3 4 5

Comment: _____

1.1.4 How would you rate the structure of the seminar?

1 2 3 4 5

Comment: _____

1.1.5 How useful was the background documentation?

1 2 3 4 5

Comment: _____

1.1.6 How well did you feel that the seminar addressed the main topic?

1 2 3 4 5

Comment: _____

1.1.7 What else would you like to have seen covered at the seminar/workshop?

1.1.8 What did you like best about the seminar/workshop?

1.1.9 What did you like least about the seminar/workshop?

1.1.10 What was most useful about the seminar/workshop?

1.1.11 How would you rate the organization of the event (e.g. the information you received prior to the event)?

1 2 3 4 5

Comment: _____

1.1.12 Was the level of complexity of the workshop/seminar's content appropriate to you?

Yes, No

If not, was it (*Please circle one*)

Too high too low

1.1.13 Was the cost acceptable?

Yes No

If not, why not _____

1.1.14 Did this seminar meet your expectations?

Yes No

If not, why not? _____

1.1.15 Did you attend more than one workshop?

Yes No (If no, go to section 2)

Section 1.2 The last workshop/seminar you attended

1.2.1. Please indicate the subject of second ERPANET workshop/seminar you attended.

1.2.2 What motivated you to attend the workshop/seminar? (*Tick all that apply*)

- Interest in the topic
- Interest in the ERPANET Project
- General interest in preservation activities
- Location
- Speakers
- Other, please specify _____

Please rate the following by circling the numbers below, using **1 = poor** and **5 = excellent**. If you would like to make specific comments, please note below.

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1.2.3 How effective were the speakers?

1 2 3 4 5

Comment: _____

1.2.4 How would you rate the structure of the seminar?

1 2 3 4 5

Comment: _____

1.2.5 How useful was the background documentation?

1 2 3 4 5

Comment: _____

1.2.6 How well did you feel that the seminar addressed the main topic?

1 2 3 4 5

Comment: _____

1.2.7 What else would you like to have seen covered at the seminar/workshop?

1.2.8 What did you like best about the seminar/workshop?

1.2.9 What did you like least about the seminar/workshop?

1.2.10 What was most useful about the seminar/workshop?

1.2.11 How would you rate the organization of the event (e.g. the information you received prior to the event)?

1 2 3 4 5

Comment: _____

1.2.12 Was the level of complexity of the workshop/seminar's content appropriate to you?

Yes No

If not, was it (*Please circle one*)

Too high too low

1.2.13 Was the cost acceptable?

Yes No

If not, why not _____

1.2.14 Did this seminar meet your expectations?

Yes No

If not, why not? _____

1.2.15 Did the workshops you attended complement each other?

Yes No

Comment: _____

Section 2: What's changed?

Please answer the following questions about the impact of the workshops/seminars. In all cases your comments would be extremely helpful, so please qualify or add to your response wherever possible.

Individual change**2.1. Have you consulted resources on the ERPANET website since attending the workshop/seminar?**Yes, No (*go to question 2.2*)**2.1.1 If yes, how often do you visit the website?**

- Daily
- Weekly
- Monthly
- less than once a month

2.1.2. Which resources in particular have you consulted?***(Will insert a list of resources available on website)***

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2.2.3 Was the discussion helpful? (*Please circle one*)

Yes No

2.3. Have you made contact with other participants since the workshop/seminar?Yes No (*go to question 2.4*)**2.3.1 If yes, for what purpose?**

2.4. Have you shared information gained at the workshop/seminar with your institution?Yes No (*go to question 2.5*)**2.4.1 If yes, was it**

Formally Informally

2.4.2 Overall what was the most valuable thing you learnt at the workshop(s)/seminar(s) that you took back to your organization?

2.4.3 Did your organization change any of its policies/strategies, or practices etc. because of the knowledge you gained at the workshop(s)/seminars?Yes No (*go to Section 3*)

If yes, please describe briefly what changed.

2.5. Has your interest in digital preservation changed since attending the workshop/seminar?

Yes No (*go to question 2.6*)

2.5.1 If yes, has your interest since the seminar/workshop

Increased Decreased

2.5.2 Why (or how) do you feel this change has occurred?

2.6. Has your confidence level changed since the workshop/seminar, in terms of dealing with electronic records preservation issues?

Yes No (*go to question 2.7*)

2.6.1 If yes, has your confidence level (*Please circle on*)

Increased Decreased

2.6.2 Why (or how) do you feel this change has occurred?

2.7. Have you used any of the information that you learnt about at the workshop/seminar?

Yes No (*go to Section 3*)

2.7.1. If yes, please describe briefly how you used the information.

2.7.2 Have you implemented any of the ideas that you learnt about at the workshop/seminar?

Yes No (*go to Section 3*)

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If yes, please describe briefly the ideas you have implemented.

Section 3: About your organization

3.1. To what sector does your organization belong?

- Public sector/not-for-profit organizations (Cultural heritage, academic, public administration, not-for-profit organization)
- Private sector (according to classification)

3.2 Within your parent organization, how many staff are there in:

Archives? _____

Records management? _____

Information technology _____

3.3 What types of digital materials is your organization responsible for preserving? (*Tick all that apply*)

- None
- Databases
- Office documents
- Scientific data
- Emails
- Web materials
- Multimedia
- Images
- Audiovisual
- 2D/3D Modelling
- Others (*please specify*) _____

3.4 Does your organization have any specific policies / strategies that relate to one or more of the following aspects of the preservation of *digital* information?

- Preservation Selection/Retention No policies
- Other, (please specify) _____

Section 4. About yourself

4.1 For what type of organization do you work?

- Public Sector Organization
- Commercial Company
- Academic Institution
- Consultancy
- Other (Please specify)

4.2 What is your function?

- Information Professional
- Archivist
- Librarian
- IT Specialist
- Consultant
- Programme Manager
- Consultancy
- Other (Please specify)

5. The Future

Are you likely to attend other ERPANET events in the future?

- Yes
- No

Why? _____

Please feel free to make any additional comments. Any comments would be greatly appreciated