Building a Sense of History: Narratives and Pathways of Women Computing Educators

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ABSTRACT

This working group laid the groundwork for the collection and analysis of oral histories of women computing educators. This endeavor will eventually create a body of narratives to serve as role models to attract students, in particular women, to computing; it will also serve to preserve the history of the female pioneers in computing education. Pre-conference work included administration of a survey to assess topical interest. The working group produced aids for conducting interviews, including an opening script, an outline of topics to be covered, guidelines for conducting interviews, and a set of probing questions to ensure consistency in the interviews. The group explored issues such as copyright and archival that confront the large-scale implementation of the project and suggested extensions to this research. This report includes an annotated bibliography of resources. The next steps will include training colleagues in how to conduct interviews and establishing guidelines for archival and use of the interviews.

Categories and Subject Descriptors

K.2 [Computing and History]; K.3 [Computing and Education]; K.7 [The Computing Profession]

General Terms

Human Factors

Keywords

Computing Education History; Oral History

1. INTRODUCTION

During the SIGCSE Technical Symposium held in Reno, NV in February 2003, a significant number of events focused on under-representation of women in the computing curriculum and as computing educators. Eric Roberts' keynote talk, "Expanding the Audience for Computer Science" [21], was a moving discussion of inclusiveness and a lament about the consequences of non-inclusion. At the Friday luncheon, Jane Margolis and Allan Fisher discussed results from their groundbreaking work, *Unlocking the Clubhouse* [15]. Several private discussions begun at the conference and continuing for some time afterward led to a November 2004, proposal for this Working Group.

In this report, we document the results from a Working Group of computer science educators at the 2005 ITiCSE conference held in Lisbon, Portugal. We were drawn together by our shared concern about women's under-representation among computing educators. We wished to honor women who had persevered in the early days of this field and to make their stories available as a resource for those following after.

ITiCSE working groups are convened for the purpose of intensive collaborative work on a topic of common interest among the participants, prior to and during the conference, generally

completing the Working Group's task by conference end. In contrast, this group was convened to lay the groundwork for a project that we hope will continue for some time to come. The Working Group leaders spent the preceding 18 months formulating the charter for the Working Group: to collect oral histories from pioneering women in computing education. The goal of the Working Group meetings at ITiCSE in Lisbon was to formulate a plan that could bring the charter to fruition.

We envision that the result of this project will be a large oral history collection of broad scope with potential value to researchers and others engaged in a variety of different projects. Because this project could result in a large quantity of data, it cannot be stored by one person in her private file space. The data must be maintained and administered by an agency or institution prepared for such a task.

We write this report for multiple audiences:

1. Those who want a concise account of what the group accomplished in Lisbon.
2. Those whose work will proceed from and build on that done in Lisbon for the oral history project.
3. Those who want insights into the evolution and dynamic of a working group.
4. Those seeking historical information about the beginnings of the oral history project.

2. PREPARING FOR THE PROJECT

This section outlines key steps and insights developed prior to the ITiCSE conference.

2.1 Building a Background

The initial vision of this project was to collect stories, or narratives, from successful computing educators, in particular from women. We were particularly interested in the various paths these individuals had followed through their careers.

We considered resources related to women and computing education, in particular factors that seemed to lead to success in the field. We found that the area of inquiry known as *oral history* includes techniques conducive to the type of data-gathering we visualized. Key resources for our project include a set of oral history evaluation guidelines [20], an Oral History Association [17], and a tutorial for conducting oral history from the Oral History Institute at Baylor University [2]. We discuss these resources further in Section 4 and in the annotated bibliography.

2.2 Project Vision

While it was clear from its inception that the primary focus for this Working Group would be women computing educators, we recognized that this is potentially the first phase of a longer-term project. The techniques developed in this first phase could be used in later phases, eventually developing into a broader project covering the history of computing education as a profession. This longer-term project should lead to a collection of oral histories from both men and women in the field as well as other artifacts. While we expect that future investigators will analyze the materials collected during each phase of the project, analysis of the materials is not the driving factor at this time. We feel it is vital to create an accessible repository of the data to support future investigations.

2.3 Survey to Gather Ideas

In order to gather ideas about the project from a broad community of individuals, we designed a survey to request ideas from colleagues. In recognition of the longer-range potential of this work, the survey solicited information for the full field of computing education, rather than restricting responses to the narrower focus of women computing educators. The full survey can be found in Appendix D.

We targeted two on-line communities with vested interest in the topic of this Working Group: Systers [23] and SIGCSE.members [22]. By the end of the conference, the survey had resulted in responses from 24 different individuals. Respondents offered ideas for questions, thoughts about how to recruit additional subjects for the interviews, and advice for how to proceed. The respondents suggested 60 educators as potential interviewees, of whom 34 are women. Several respondents also indicated interest in becoming involved with the project as planners, interviewers, or subjects.

3. FORMULATING THE PROJECT GOALS

3.1 Converging on the Goals

At the heart of this project is the recognition that women are under-represented in the computing field [12]. In particular, Working Group members had a variety of ideas for how to address the lack of women in computing education. Among the ideas:

- providing role models
- capturing stories of women of different ages to provide a history of women in computing education
- exploring the history of early women computing educators to learn about and honor the stories of these women, who often faced difficult circumstances
- recording difficulties that women educators encountered during their careers, and in some cases overcame, as a source of inspiration and support

Considering the challenges faced by women in early computing education also brought up questions about how they managed those challenges: What internal reserves and external resources did they draw on? How did they sustain their confidence in their own capabilities, often as the only woman in what was at times a hostile environment? This led the group to consider self-efficacy beliefs, which Bandura ([2], p. 391) defines as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances". A person's self-efficacy beliefs can play a significant role in her capacity to manage difficulties: if she believes she can actualize her intentions, obstacles presented by the environment impose less drag.

3.2 Focus for the Short Term

This section addresses a number of key points that the group must consider for the near term in order to coordinate work by a distributed set of volunteers.

3.2.1 Protocol for Collecting Stories

A key task of the Working Group was to establish a protocol to be followed by all volunteers on this project. The resources related to

collecting oral histories provided a rich source of information for defining the protocol to be used over the life of the project. A clear protocol will ensure consistency in the quality and general content of the interviews, especially for interviewers with little experience in collecting oral histories. We discuss the protocol further in Section 5.

3.2.2 Identifying Potential Subjects

The primary focus for this phase of the project is women computing educators who are late in their careers. The project will seek an international sample in order to ensure a more complete picture; during the conference in Lisbon, many non-U.S. educators showed interest in the project.

It is urgent to capture narratives from older and more senior educators while these pioneers are still able to participate in the interview process. The Working Group has created a list of potential subjects, including ideas drawn from the results of the survey described in Section 2.3.

3.2.3 Legal Issues: Consent, Access, Ownership

A paramount concern for the project is the set of legal issues associated with this form of academic inquiry. Pressing concerns that must be resolved include the following:

- obtaining permissions to ensure that the materials are openly accessible for use in future studies and analyses;
- determining who will have access to the materials collected in this project;
- determining ownership of the materials; and
- designing appropriate copyright and permission forms.

3.2.4 Storage and Transcription of the Interviews

When an interview is complete, the recording(s), notes, and any supplemental materials must be prepared for later use and analysis. As a temporary measure, a copy on CD will provide secure storage of the materials until incorporated into a formal repository.

To make the interviews more accessible to future users such as researchers and historians, common practice is to develop a transcript. Besides being easier to scan quickly, a good quality transcript makes it easier to create notes and cross-reference parts of the interview. There are two main approaches to creating transcripts for an interview:

- listening to the taped interview and capturing the dialog manually, a tedious and exacting process, or
- using voice recognition software to automatically create a transcript in a computer file, a process that tends to be very error-prone.

Once the transcription is complete, careful editing can make the work clearer and more accessible. However, editing requires a deft touch, using pre-determined guidelines specific to the project. The editing process may consider issues such as how and whether to correct errors (for example, should transcriber errors be fixed during editing? Should errors of fact acknowledged by the interview subject be set right?) and whether to clear out irrelevant information (for example, deleting [presumably meaningless] false starts to make the transcript's meaning clearer). Editing may also introduce paragraphs and subheadings to help highlight topics and make it easier for a future reader to traverse the transcribed interview.

3.3 Archival of the Project Materials

For security and availability of the collected materials, it will be vital to identify a means for the long-term storage of the interviews and other artifacts. In addition, the repository can be used to maintain a bibliography of results related to the overall project. While it is premature to determine where this work might eventually reside, an excellent example of the appropriate style of storage and availability is the repository related to the history of computing maintained by the Charles Babbage Institute [4].

4. BACKGROUND

To set the context for the Working Group's project, this section considers four background areas: the area of inquiry known as oral history, resources related to the history of computing, resources on the history of women in computing, and work related to the history of computing education.

4.1 What is Oral History?

Oral history is a method of inquiry with a rich tradition and specific guidelines. While folklore and storytelling are examples of oral history through the ages, modern techniques have improved the reliability of the data one can gather in an oral history project. The Wikipedia article on oral history [25] explains:

> "Oral history is an account of something passed down by word of mouth from one generation to another. Oral history is considered by some historians to be an unreliable source for the study of history. However, oral history is a valid means for preserving and transmitting history."

The Oral History Association [17] has published guidelines that address several aspects of conducting oral history, including responsibility to subjects, the public, and the profession; interview content and conduct; storage and preservation of media and interviews; and an excellent bibliography.

The *Oral History Primer* from the Department of History at California State University, Long Beach [6] offers an overview of many of the aspects of conducting an oral history project, such as how to design the study, how to conduct and process the interview, and how to use the completed interview. This resource offers a sample outline, a sample transcript, and a sample agreement form.

As the Working Group prepared for the meetings in Lisbon, a number of oral history projects helped us formulate ideas about how the materials from such a project can be planned for and archived. For example, the London Voices project [14] gathered oral histories from a variety of individuals and has made these stories available via a Museum of London website. The Oral History Directory from Alexander Street Press [18] is an ambitious effort to index the major oral history collections in English throughout the world. During our working group presentation at the ITiCSE conference, we learned of another project in Brazil, O Museu da Pessoa (Museum of the Person) [16], which can provide additional ideas. The annotated bibliography in Appendix E lists relevant projects we have discovered thus far.

One of the Working Group members in Lisbon, William Aspray, is a historian of computing who has conducted over 200 interviews eliciting oral histories. The materials related to these interviews are in the repositories of the Charles Babbage Institute for History of Computing [4], which we discuss further in the next section. Aspray's participation in the Working Group provided key inputs and examples as the group developed the guidelines and planning reflected in this report.

4.2 History of Computing Resources

Interest in the history of computing is broad-based. A variety of historical projects focus on areas as diverse as artifacts (e.g., punched cards, old computers), the timeline of events and developments in computing, and the people involved in driving the field forward. This section highlights a few computing history projects that seem particularly relevant in the context of this Working Group's project.

The Charles Babbage Institute (CBI) [4] was started in 1978 and by 1989 became an historical archives and research center of the University of Minnesota. CBI preserves relevant historical documentation in a variety of media, conducts and fosters research in history and archival methods, and sponsors scholarly meetings and publications related to the history of computing. The resources on this site include a set of more than 300 oral histories, of which no more than 5% appear to be from women.

The IEEE Annals of the History of Computing [8], a quarterly publication started in 1979, features scholarly articles by leading computer scientists and historians, as well as firsthand accounts by computer pioneers. The Annals is intended to serve as a focal point for collecting and disseminating information on historical projects and organizations, oral history activities, and international conferences.

The IFIP Working Group 9.7 on the History of Computing [9], established in 1992, focuses on the history of computing and informatics with a view to providing the impetus to preserve the records and artifacts of information processing inventions, practices, and activities throughout the world under the auspices of IFIP and its constituent organizations. Among the goals of this group are to encourage the development of national archives, to identify pioneers worthy of appreciation and distinction, to develop publication plans for histories of Information Processing, and to promote the inclusion of historical modules in appropriate curricula.

The Virtual Museum of Computing (VMoC) [24], maintained by Jonathan Bowen of London South Bank University, is a collecting point that leads to many different sites across the web. Sections currently featured on the VMoC site include corporate history and overviews, history of computing organizations, and general historical information.

The History of Computing project [7], started by Cornelis Robat in the late 1980s, is now supported by a non-profit foundation founded in April, 2000. This project is based in the Netherlands and has partners from throughout the world, including the Ukraine, Poland, and Mexico. The project seems focused on gathering artifacts into an enormous database to ensure that important historical information remains available.

4.3 Resources on the History of Women in Computing

Especially relevant to this Working Group's efforts are projects to collect oral histories of women in computing. Janet Abbate [1] is conducting a research project to develop a history of women in computing in the United States and Britain since World War II. Her project draws on oral history interviews with more than fifty women who were active in computer science departments and the software industry.

A project that apparently never came to fruition is mentioned on a history of computing site created by J.A.N. Lee [13]. This project was called "Women in (the) Computing History" (with the acronym "witch"). The description of this project states:

> "In keeping with the tradition of documenting women's history through oral histories, the Women in (the) Computing History mailing list hopes to augment traditional resources of women's and histories of computing by being a repository for women's own stories throughout the history of computing. All in computing, too, not just those of us formally schooled in the computing sciences."

Unfortunately, it appears that this project has disappeared from view, as we have thus far been unable to establish contact with anyone associated with the project.

The IFIP Working Group 9.8 on Women and Information Technology [10] was established in 2001. Aspects of this group's charge include the exchange of women's experiences as scholars and professionals in information technology, integration of feminist perspectives into computer science, and developing an understanding of the gendered aspects in design, realization, and implementation of information systems. The aims that seem especially relevant for this project are analyzing the role of gender in computing education and educational strategies to support and retain girls and women.

4.4 History of Computing Education Resources

Considered separately from resources related to the History of Computing, few resources address the history of computing education. In 1982, the Mathematical Association of America published a perspective on the field of Computer Science. The first chapter is an in-depth exploration of the development of Computer Science, with emphasis on the educational underpinnings of this field [19].

In August, 2004, when the IFIP 18th World Computer Congress was held in Toulouse, France, one component of the Congress was a History of Computing in Education conference. A book published in 2004 derives from contributions made at this conference. This book [11] considers two aspects: the impact of computing on education over the past forty years and as a pedagogical tool in computing education. Various articles consider how organizations have used computers to enhance teaching and learning, spanning experiences in elementary education through university studies in several countries.

5. WORK DURING ITiCSE

Once the Working Group convened in Lisbon, the face-to-face meeting time was spent primarily on four activities: refining the purpose of the project, discussing and demonstrating the relevant techniques, developing a protocol to guide the process of planning and conducting interviews, and training members in how to use the interviewing techniques and materials. Each of these aspects are covered below.

5.1 Refining Purpose

During the Working Group meetings, we refined the purpose and methods of the project. We realized the need to differentiate between the purpose of the interviews (how they are structured and the kind of information they elicit) and the purpose of the project as a whole (how the interviews will be used). We also came to realize that our original notion of interviewing "successful" women computing educators constrained the project in two ways: 1) defining what we meant by "success" and 2) losing the stories and lessons of those who did not continue in computing education.

5.2 Demonstration

During the two days of meetings before the ITiCSE conference began, a key aspect of the Working Group's efforts was to explore the theory and techniques guiding this project. To this end, the group discussed general techniques for how to use oral histories.

Two of the group members, Aspray and Barker, have social science backgrounds: Aspray is a historian of computing, while Barker is a social scientist whose work focuses on women in computing. Because most group members had little experience with conducting this type of inquiry, Aspray overviewed the purposes of oral history and methods for conducting interviews. To make the techniques tangible, Aspray conducted a demonstration interview with Working Group leader Barbara Owens as the subject. In preparation for the interview, Aspray and the remaining Working Group members formulated a set of topics and prompts to include in the interview. The demonstration interview was recorded on several digital devices, both to test the devices and to avoid the possible loss of information due to technical difficulties.

After the demonstration interview was completed, Aspray and Barker led the group in deconstructing[1] the interview. During this session, the group reflected on what went well, what could be improved, and what to change in the future.

5.3 The Protocol

A major product of our Working Group was a protocol for this project. After much discussion, we concluded that having a common set of materials would be vital for achieving consistent results in interview sessions conducted by a wide variety of volunteers. The protocol materials that will be used to support the interview process include an opening script, an outline of topics, a set of sample probing questions or prompts, and guidelines for conducting interviews. We discuss each of these items in the remainder of this section.

[1] Deconstructing an interview is different than analyzing the results; the former focuses on process, while the latter considers content.

5.3.1 The Opening Script

The opening script is used by the interviewer to set the scene before beginning the session. For example, the interviewer should caution the subject that it is common for sensitive topics to come up during the course of a session and that the subject should feel free to ask that the recording be turned off. As the session gets underway and the interviewer starts the recording device(s), specific opening information should be read onto the recording in order to provide a full context for this session. The interviewer could state, for example:

> "This is an interview with (interview subject's name) from (name of institution), conducted by (interviewer's name). This interview is being recorded on (date) at (city, country). It is part of the (computing education oral history series / formalized name yet to be determined).
>
> "Did we give and pronounce your name correctly?"[2]

After this, the interviewer can begin giving prompts, such as "Tell us about your parents, for example what they did for a living." In this example statement, using the pronoun "us", rather than "me", can help the subject remember that her story is being told for a wider audience than just the interviewer at hand.

5.3.2 Outline of Topics

The Working Group developed an outline of relevant topics to be used in guiding the interviews. The outline can also assist the interviewer in preparing for the interview, with the goal of making the face-to-face time with the subject as effective as possible. The Outline of Topics that the Working Group developed appears in Appendix A.

5.3.3 Sample Probing Questions

Prompts are follow-up questions designed to elicit more detailed answers or follow up a thread introduced in an earlier answer. Because an interviewer must feel free to pursue topics that emerge as the session progresses, the prompts set provides examples for how the interview can proceed, rather than a strict step-by-step recipe. The Working Group developed a list of example prompts, which appears in Appendix B.

5.3.4 Guidelines for Conducting Interviews

This oral history project will require many interviewers in order to increase the number of stories that can be collected within a limited timeframe and across a wide geographical area. Guidelines will help coordinate the efforts across volunteers in order to achieve a level of consistency across the results. Guidelines will also help the volunteers prepare for and conduct sessions. The guidelines can assist an interviewer in establishing the proper setting, maintaining an appropriate flow, and helping the subject focus on the issues at hand.

To prepare for the session, the interviewer should study relevant background materials such as the subject's resume or vita, their professional publications, and anything written about the subject

[2] This final sentence is relevant primarily for names that are unusual or difficult to pronounce.

in secondary literature. This information can help the interviewer plan and prioritize the specific prompts, as well as the order of prompts, to be used during the interview session. At the same time, the interviewer should not use the outline of topics as "tick off" items. An effective interview will be interactive in nature, with the specific choice and ordering of prompts based on previous answers.

Because the duration of a session must be limited to no more than an hour or two, the time must be used effectively. This makes it essential for the interviewer to come to the session as well prepared as possible. The face-to-face time during the session should be used to explore tacit knowledge and the reasons for certain behaviors and outcomes, providing insights into the motivations behind events in the subject's life. To use the time well, the interviewer must avoid spending precious time during the session pursuing information that can be gleaned from the subject's vita or other readily available materials.

The Working Group's guidelines for conducting interviews appear in Appendix C.

5.4 Training

On the second day of the ITiCSE Working Group meetings, the group divided into two sub-groups, each of which included three computing educators and a "consultant" (either Aspray or Barker). In these sub-groups, the computing educators tested the tentative protocol to conduct practice interviews with one another. Each interview session lasted about 15 minutes, with one computing educator interviewing a second using the list of topic areas, while the third member watched and listened from the side. During the practice interviews, both sub-groups explored technologies that can be used to record the interviews and transcribe the audio recordings, testing multiple devices and in one group using a headset to capture the answers for automatic transcription. The "consultants" observed during the interviews, then helped the group deconstruct the interviews and critique the methods.

6. REFLECTIONS AFTER ITiCSE

Working Group members have offered the following as the most positive outcomes of the time in Lisbon (given in no particular order):

1. Learning techniques of oral history and observing an experienced interviewer using the techniques during a demonstration.
2. Hearing diverse ideas about project goals and reaching consensus.
3. Fleshing out the protocol for conducting interviews, thus making clear what should be asked during a session. The protocol includes a detailed set of guidelines for conducting an oral history interview (Appendix C), an opening script (Section 5.3.1), a topic outline (Appendix A), and sample prompts (Appendix B).
4. Being trained in interview techniques, which allowed the group to experiment with the equipment and pilot the process of gathering histories. Several members expressed the desire for additional training and for the opportunity to review recorded interviews conducted by more experienced individuals.
5. Understanding that the operative dynamic in an interview/oral history differs from that in conversation, although the similarities make it tricky to balance the exchange. Members felt very positive about the experience of the practice interviews. One member reported that she often found herself caught up in the stories the subjects were telling, leading her to realize that it takes effort to learn to stick to the list of topics that the interviewer wants to cover.
6. Seeing the importance of privacy considerations, as well as the need to obtain permission and plan for storage and access.
7. Getting to know the other group members and hearing significant parts some of their stories. Even this small sample gave group members a feeling for the wide variety of paths taken and challenges overcome.
8. Discovering that the individual paths were an interplay between a recitation of facts (dates and places) and the deeply felt emotional life that often motivated a person's actions. This underscored the need for a respectful and reasonably well-trained approach by each interviewer.

The group encountered a number of difficulties with the software and equipment. It became clear that the equipment is the weakest link in performing an interview. The interviewer cannot be certain that the equipment is functioning as expected until he or she takes a break to review the recording.

Based on experimentation during the Working Group meetings, the Working group can make the following observations:

- The group used several different models of the Olympus DVR (Digital Voice Recorder) and was able to get each model to work properly.
- Direct recording to the computer worked well through the Olympus VN-240PC digital recorder.
- Transferring the recordings to CD was simple and seemed like an excellent way to create a temporary archive.
- While the Dragon Naturally Speaking Preferred speech recognition software [5] may be helpful, it will require further experimentation to use it effectively.
- While the group's experiences with the i-River recording devices were not successful, one member has been pleased with the performance of this device in the past.
- In general the digital recorders worked well. However, in every session at least one of the recorders failed, generally due to inexperience, human error, or time limitations. A key conclusion is that equipment redundancy is imperative. We decided it is safest to use at least three recording devices during each interview in order to ensure the best possible quality of recording.

Group members were surprised at the difficulty of transcribing recorded interviews. Some members had hoped there would be useful tricks or slight-of-hand for doing transcription. Unfortunately, creating a good quality transcription is simply a lengthy and intense process. A group member who transcribed her own interview found that it took nearly five times as long as the interview duration to complete the transcription of the session!

During early planning for the Working Group, the co-leaders had hoped to "… conduct initial analysis of pilot interview data, and identify emergent themes". In the end, the group spent no time

with formal analysis of the practice interviews. Instead, the group used the time to hone interview techniques and understand how to move the project forward.

During the first day of the ITiCSE conference (after the Working Groups had each met for two full days), each Working Group presented their group's mission and progress for conference attendees. The main impressions that Working Group members brought away from this presentation were very positive, with many attendees showing strong interest in the project and offering encouragement as well as suggestions for potential subjects.

7. WHAT COMES NEXT?

While the experience during the ITiCSE conference was valuable, the time in Lisbon was too short and the expectations too high for the group to be able to complete everything it had hoped to accomplish. By the end of the conference and the completion of this report, the Working Group had prepared an annotated bibliography, learned about oral histories, piloted hardware and software for recording, and set the stage for ongoing collection of histories, including a protocol to follow in planning for and conducting interviews. While the Working Group did consider legal and ethical issues during their discussions, a great deal must be resolved before the process of active interviewing can begin. In particular, access and ownership issues must be resolved before we can begin collecting interviews.

The Working Group has an excellent start in recruiting volunteers to help in carrying out all aspects of the project. However, the work of the volunteers must be coordinated in order to produce coherent results. In addition, volunteers who conduct interviews must be trained in the techniques. Various Working Group members have agreed to propose workshops and other training opportunities at a variety of venues and events.

A challenge will be to select the set of subjects from the many suggestions we have received. For the current stage of work, we will include only women computing educators who are retired or in the latter stages of their careers. The entire project has an underlying sense of urgency because many of the pioneers are in poor health or have already passed away. We have seen clear interest in eventually expanding the project to include the stories of women in earlier parts of their careers and men at any stage of their careers.

Obtaining one or more sources of funding will be essential to achieving the full vision of the project. Funding can support aspects such as transcription and review, travel to conduct training or to meet with subjects, and setting up permanent archival facilities.

While finding a permanent home for the oral histories is not essential during the early phases of the project, it is important if the collected stories are to be useful and usable. In addition to providing for archival of the recordings and transcriptions, the eventual home should allow for including contextual materials, such as course and curriculum artifacts. The archival capability must include sophisticated support for indexing and searching in order to support future visitors in browsing the collection and analyzing the interview transcriptions and other artifacts.

Ultimately, whether this project will succeed or fail depends on the level of engagement we can generate for all phases of the project. To start, we must involve the computing education community in collecting stories from women computing educators who have retired or are about to retire. At the same time, we must create and maintain a sense of excitement about the potential of the project. If there are sufficiently many interested volunteers, the full-blown project to collect stories from men and from women earlier in their careers could certainly get underway in parallel with the current efforts.

8. ACKNOWLEDGMENTS

The individuals who met in Lisbon enjoyed the unique opportunity to learn these techniques and plan for what we hope will be a productive long-term project. The group was fortunate to have additional individuals involved in the pre-conference discussions, several of whom made key contributions to the preparations. In particular, the Working Group is grateful to Bettina Bair for her enthusiastic support. Bettina set up the group wiki and provided feedback as well as many ideas for resources. We are also grateful to the others who participated in the pre-conference discussions, including Anne Applin and Amardeep Kahlon. We thank the individuals who responded to our survey and offered suggestions of future subjects and possible questions. Comments from the anonymous reviewers allowed us to refine the purpose of the report and improve the presentation. Late discussions with Susan Gerhart provided additional ideas and inspiration for future work.

9. REFERENCES

The references given here are used directly in the text. In Appendix E we provide an annotated reference list, which repeats several of these references supplemented with our annotations.

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