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What it takes: Issues in implementing electronic portfolios

Kristen Steele

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**WHAT IT TAKES:
ISSUES IN IMPLEMENTING ELECTRONIC PORTFOLIOS**

By

Kristen J. Steele

**An Independent Study
submitted in partial fulfillment of the requirements
for the degree of:**

Master of Science in Deaf Education

**Washington University School of Medicine
Program in Audiology and Communication Sciences**

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**Approved by:
Barbara Lanfer M.A.Ed., Independent Study Advisor**

Abstract: The purpose of this study was to investigate the issues in implementing electronic portfolios as a school-wide innovation, and to provide a resource guide for the future use of electronic portfolios at Central Institute for the Deaf.

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Table of Contents

Acknowledgements	ii
List of Abbreviations	2
Literature Review of Background Information	3
Purpose	24
Methodology	24
Results	27
Discussion	30
Conclusion	31
Works Cited	33
Appendix A: Electronic Portfolio Development Overview	36
Appendix B: Selection of software & converting your work into digital format	38
Appendix C: Commercial Products and Services	41
Appendix D: Professional Development Recommendations	46

List of Abbreviations

E-folio-Electronic portfolio

CD-ROM- Compact disc, read-only memory

DVD-Digital versatile disc

CID-Central Institute for the Deaf

PLOP-Present level of performance

IEP- Individualized education program (or plan)

TAGS- Teacher's assessment of grammatical structures

IFSP-Individual family service plan

FERPA- Family Educational Rights and Privacy Act

HIPPA-Health Insurance Portability and Accountability Act

OCR- Optical Character Recognition

PDF- Portable document format

Background Information from Literature Review

To provide a context for the development and implementation of electronic portfolios and guidelines for its use, a review of the literature on electronic portfolios and more traditional paper-based portfolios has been conducted. A comparative description of the two types of portfolios is necessary to clearly depict the similarities, the differences, and the additional issues required to implement either system. The literature review focused on portfolio use in general education institutions, and most of the statements regarding portfolios are drawn from the education literature. Several search engines were used to gather the articles used for this literature review. Articles were chosen for inclusion in this review on the basis of their relevance to portfolio use, especially electronic portfolio use, and for their availability in electronic form. Peer-reviewed articles from reputable journals were given precedence.

Research on electronic portfolios is fairly new and most studies so far have focused on their uses for the learning and development of pre-service teachers (Milman & Kilbane, 2005; Sherry & Bartlett, 2005). Barrett and Knezek (2003) made the argument that electronic portfolios should be electronic versions of paper portfolios. The same thinking about purpose and assessment lies behind both kinds of portfolio. With this in mind, the discussion will begin with portfolios in general: their benefits; problems, issues and tensions that arise relating to their use; and the essential elements that need to be present in their design to ensure their success as learning, development, and assessment tools. Following this, electronic portfolios will be discussed in depth: how they differ from traditional portfolios, their benefits, and issues relating to their use and implementation. “In adopting electronic portfolios as a medium for student learning,

certain criteria are vital to its success and several barriers to implementation exist. In addition, several educational and technical considerations are inherent when developing an electronic portfolio system” (Barrett, 2002).

Traditional Portfolios

A portfolio is a collection of evidence that is gathered to show a person’s learning journey over time and to demonstrate their abilities. Portfolios can be specific to a particular skill area(s), a glimpse at overall academic accomplishments, or they can very broadly encompass a student’s lifelong learning. A multitude of artifacts can be used in a portfolio: samples of writing, both finished and unfinished; photographs, videos, culminating projects, observations and evaluations from supervisors, or teachers, and reflective thinking about all of these. In fact, it is the reflections on the pieces of evidence, the reasons they were chosen, and what the portfolio creator learned from them that are the key aspect to any portfolio (Abrami & Barrett, 2005; Klenowski, Askew, & Carnell, 2006; Loughran & Corrigan, 1995; Smith & Tillema, 2003). In that way, those compiling portfolios are active participants in their own learning (Wade, Abrami, & Sclater, 2005) go further, arguing that “neither collection nor selection of pieces to be incorporated into a portfolio are worthwhile learning tasks without a basis in reflection. Reflection undergirds the entire pedagogy of portfolios”. Two other key elements to portfolios are that they measure learning and development over time (Barrett, 2000; Challis, 2005), and that it is the process of constructing a portfolio, rather than the end product, that is where the learning takes place (Smith & Tillema, 2003).

Benefits of portfolios

If used to their full potential, portfolios have a number of benefits for students. Portfolios help to focus student thinking (Wade & Yarbrough, 1996), provide a means to translate theory into practice (Hauge, 2006), and, most importantly, document a learner's progress over time (Abrami & Barrett, 2005; Challis, 2005; Smith & Tillema, 2003). They can enhance students' communication and organizational skills; and are a way of identifying and recognizing prior learning, which can lead to new learning outcomes (Brown, 2002). Through the process of portfolio construction, students gain a broader sense of what they are learning (Young, 2002). They can see their learning unfolding (Darling, 2001), acquire an awareness of their accomplishments and come to understand how their learning takes place (Brown, 2002).

Decisions to be made before implementation

Several decisions need to be made about why to construct a portfolio, how to go about it, what to include, and what happens after it is completed (Zeichner & Wray, 2001). Following Zeichner and Wray's argument, several important questions for those considering implementing a portfolio:

- What is the school's vision for the portfolios?
- What is the purpose of the portfolio: for learning, for assessment, for teacher-parent communication?
- Who decides what should be included in a portfolio: the teacher compiling the portfolio, the students for whom it is being created, or both?
- How prescriptive should guidelines for creating a portfolio be?
- How should the pieces of evidence in the portfolio be organized: around themes chosen by the student, around program goals, or around achievement standards?

- What kinds of artifacts are acceptable as pieces of evidence? What should, and should not, be included in the portfolio?
- How frequently should students be expecting feedback on their progress?
- How should the portfolios be assessed: through very specific evaluation criteria and grading rubrics, or should a more informal methodology be put in place?
- What should happen to the portfolio after it is finished? Is the process ongoing?

Issues relating to the use of portfolios

A variety of problems and issues arise with the use of portfolios as an assessment exercise in academic settings, some of which are mitigated by the shift to an electronic environment, and some of which are exacerbated. A lack of well-defined guidelines and a clear structure (Smith & Tillema, 2003) and a lack of examples of past portfolios (Darling, 2001), can lead to administrator, teacher, and student confusion and anxiety about the scope, nature and value of the task (Darling, 2001; Wade & Yarbrough, 1996). (Smith & Tillema, 2003). Concerns are also expressed over the difficulty of assessing portfolios. Smith and Tillema (2003) see a lack of match between assessment criteria and the goals of the program of study, or what competencies students are expected to develop. They also see a tension between the measurement of standards and capturing development and reflection. The danger is that learning and reflection will get lost in the drive to measure competency. Many proponents from various educational settings argue that these issues can be avoided by setting clear guidelines and encouraging communication between the individuals so that such problems and concerns can be minimized. As for assessment criteria of portfolios as a whole, more research is needed in

this area due to the lack of reliable data and/or the subjectivity of the inclusion of artifacts. Suggestions for further research is listed below.

Success criteria

From consideration of the above problems and issues, a number of criteria for the successful use of portfolios have been put forward (e.g. Loughran & Corrigan, 1995; Smith & Tillema, 2003; Wade & Yarbrough, 1996). In summary, the success criteria are:

- Familiarity with the portfolio concept, including an understanding of both the process and the product of portfolio construction;
- Clear framework and guidelines;
- Structure tempered with freedom for creativity;
- Feedback during the evidence collection process;
- Understanding of the value of reflection;
- Understanding of the value of the portfolio for future use;
- Motivation to learn and achieve good marks;
- Student ownership of the portfolio;
- Making connections between the portfolio content and the outside life of the student;
- Consideration of the target audience;
- Sense of achievement at overcoming initial struggles to understand the portfolio concept;

Electronic Portfolios

An electronic portfolio (also known as an e-Portfolio, e-folio, digital portfolio, and web-folio) is essentially an electronic version of a paper-based portfolio, created in a computer environment, and incorporates not just text, but graphic, audio and video material as well. Abrami and Barrett (2005) define an electronic portfolio as: “a digital container capable of storing visual and auditory content including text, images, video and sound...designed to support a variety of pedagogical processes and assessment purposes”. Challis (2005) provides a more in depth definition: An e-Portfolio is described as:

- Selective and structured collections of information
- Gathered for specific purposes and showing/evidencing one's accomplishments and growth
- Stored digitally and managed by appropriate software
- Developed by using appropriate multimedia and customarily within a web environment
- Retrieved from a website, or delivered by CD-ROM or by DVD.

Uses of electronic portfolios

There are three main uses for electronic portfolios: for students while studying, for graduates while moving into or through the workforce, and for institutions for program assessment or accreditation purposes (Lorenzo & Ittleson, 2005a). The first use allows students to demonstrate their competence (Milman & Kilbane, 2005); develop, demonstrate and reflect on their work; show their attitudes, knowledge and skills (Sherry & Bartlett, 2005); document how inquiry works in practice; and provide evidence of

reflection (Smits et al., 2005). Electronic portfolios are most commonly used in this way in colleges of education (Lorenzo & Ittleson, 2005a). The second is a way for graduates or those already in the workforce to gain licensure or registration to showcase their qualifications and competencies in job interviews, for appraisal, or for promotion as well as for critical reflection and learning purposes (Lorenzo & Ittleson, 2005a). The third use is as a vehicle for institution-wide reflection, learning and improvement to demonstrate institutional accountability, to make accreditation processes more visible, and to show collective student progress (Lorenzo & Ittleson, 2005).

Benefits of electronic portfolios

There are a multitude of benefits of electronic portfolios. The following summarizes the main points made in the literature:

- *Evidence of learning.* As Abrami and Barrett (2005) state, electronic portfolios encourage “flexible, inclusive, and distributed evidence of learning including variable times and places for learning”. Electronic portfolios provide a ‘rich picture’ of student learning and competencies (Love & Cooper, 2004), thus facilitating authentic learning (Wade et al., 2005). They actively involve students in demonstrating past learning and current learning gains (MacDonald, Liu, Lowell, Tsai, & Lohr, 2004; Wade et al., 2005), and help students make connections between their course projects and non-academic projects (MacDonald et al., 2004). Finally, electronic portfolios help a learning community to establish its goals and expectations (Ahn, 2004).
- *Skill development.* The creation of an electronic portfolio serves to develop multimedia technology skills (Abrami & Barrett, 2005; Barrett, 2000; Heath,

2002, 2005; Wade et al., 2005; Wall, Higgins, Miller, & Packard, 2006), as well as more general literacy, communication and problem solving skills (Abrami & Barrett, 2005; Canada, 2002). Electronic portfolios are also a way to showcase technology skills (Heath, 2005), and to model technology skills for others (Barrett, 2000).

- *Feedback.* Electronic portfolios facilitate the exchange of ideas and feedback (Lorenzo & Ittleson, 2005). Students can receive feedback quickly and regularly throughout the process of constructing their portfolios (Ahn, 2004), and across electronic media channels (Abrami & Barrett, 2005).
- *Reflection.* Just like traditional paper-based portfolios, electronic portfolios encourage students to reflect on their work and their reasons for choosing certain pieces to be incorporated in their portfolio. Through reflection, electronic portfolios make meaning out of diverse and unconnected pieces of information (Cambridge, 2001).
- *Psychological benefits.* For those compiling them, electronic portfolios foster a sense of pride in their work, a sense of personal accomplishment, and a feeling of satisfaction (Canada, 2002; Sherry & Bartlett, 2005).
- *Assessment.* Electronic portfolios engage students in the evaluation and assessment process (Wade et al., 2005), as they continually revisit and refine their portfolios. Students gain a better understanding of the assessment process and can use these skills to constantly improve their learning (Cambridge, 2001).

Electronic portfolios can also help to put areas that need improvement into

context; they can show the steps taken to reevaluate, and demonstrate what the student has learned from the experience (Cambridge, 2001).

- *Artifacts*. Many kinds of artifacts can be incorporated into electronic portfolios. They can integrate text and multimedia elements such as pictures, graphics, and audio and video recordings (Abrami & Barrett, 2005; Canada, 2002; Heath, 2005; Love & Cooper, 2004; Milman & Kilbane, 2005; Wade et al., 2005). They also take advantage of work that is already in an electronic format (Heath, 2002, 2005).
- *Maintenance*. Electronic portfolios are easy to maintain, edit and update, and because of this are more likely to be constantly revised, (Canada, 2002; Heath, 2002, 2005).
- *Portability and sharing*. Whether saved to CD-ROM or to the web, electronic portfolios are easy to carry, to share with others, and to transport into a new system or new working environment (Abrami & Barrett, 2005; Strudler & Wetzel, 2005; Wade et al., 2005). For these reasons, they have longevity, existing beyond the end of a particular skill level obtained. (Canada, 2002).
- *Access*. Especially when saved to the Internet, electronic portfolios are easily accessible by a number of people. Students can work on their portfolios, and supervisors can review and assess portfolios, from many different sites (Ahn, 2004; Canada, 2002; Heath, 2005; Wade et al., 2005).
- *Audience*. Because of their accessibility, electronic portfolios are viewable by a much larger audience (Ahn, 2004; Strudler & Wetzel, 2005), including students' peers, supervisors, assessors, parents, and others (Wade et al., 2005).

- *Organization*. Electronic portfolios are easy to organize and search (Ahn, 2004; Wade et al., 2005; Young, 2002). Because of their electronic nature, they can be organized in complex ways, with navigational links connecting ideas and artifacts (Canada, 2002; Heath, 2002, 2005).
- *Storage*. Because they do not rely on large binders full of paper, electronic portfolios are easy and efficient to store (Ahn, 2004; Canada, 2002).
- *Cost*. Electronic portfolios are inexpensive (Heath, 2005), especially to reproduce, although initial set-up costs in software and equipment may in fact be quite high.
- *Privacy*. Finally, electronic portfolios can include a privacy feature (Young, 2002) to protect student work. Access can be limited to only those individuals who wish to view/review, or assess their work.

Differences from traditional portfolios

While electronic portfolios may be a technological change, but not a conceptual change, from paper portfolios, they still have a number of characteristics that differ from traditional portfolios. (Barrett & Knezek, 2003; Strudler & Wetzel, 2005). Challis (2005), Abrami and Barrett (2005) and Strudler and Wetzel (2005) have all provided a variety of points of difference, which are summarized here. Electronic portfolios:

- Are easier to search, and records can be simply retrieved, manipulated, refined and reorganized;
- Reduce effort and time;
- Are more comprehensive and rigorous;
- Can use more extensive material;

- Include pictures, sound, animation, graphic design and video;
- Are much smaller;
- Are cost effective to distribute;
- Are instantly accessible;
- Can have an organizational structure that is not linear or hierarchical;
- Are easy to carry and share with peers, supervisors, parents, and others;
- Allow fast feedback;
- Showcase the technological skills of the creator;
- Provide access to a global readership if they are based on the web

Issues relating to the use of electronic portfolios

As with traditional paper-based portfolios, a number of issues and challenges arise with the use of electronic portfolios in education. Abrami and Barrett (2005) discuss the challenges to assessment that electronic portfolios present. Their concern is that it is difficult to authenticate the evidence in such a portfolio – is it really the work of the student in question? The technical knowledge required to create a portfolio may also unfairly disadvantage some students, and the danger is that students will end in being assessed more on their technology prowess. Finally, Challis (2005) raises a number of issues that will need to be addressed by an institution: how to manage the volume of data, who will have access to the electronic portfolios, the security and privacy of students' work, and copyright and intellectual property concerns. In other words, some of the benefits of electronic portfolios can also be issues that need to be resolved before they can be successfully implemented.

Barrett and Knezek (2003) argue that electronic portfolio systems need to find a balance between highly structured templates, which scaffold the learning of the portfolio process and are useful for novice portfolio users, and open-ended or self-directed portfolio tools, which foster learners' knowledge of themselves, and suit more advanced users. Carliner (2005) agrees, suggesting that electronic portfolio software be designed for users with multiple levels of technical skill. Perhaps software for electronic portfolios could be designed to allow for more flexibility, learning a lesson from the layered user assistance provided for other types of software. Layered assistance provides people with increasing levels of flexibility and freedom as they reach more experienced levels of use (Carliner, 2005).

Both Heath (2005) and Pecheone et al. (2005) agree that electronic portfolio construction takes time, that all participants of the portfolio development process need technology skills or adequate training to gain those skills, and that technical problems with software or equipment can be very frustrating and stressful. Heath (2005) adds that if equipment needs to be upgraded to take full advantage of electronic portfolios, the process can also be very expensive. Hauge (2006), found that students and teachers with high levels of computer experience found electronic portfolios easiest to use, but that students without such experience did eventually catch up.

Tosh, Light, Fleming and Haywood (2005) provide a timely warning of the problems that can be encountered in electronic portfolio implementation if the needs and attitudes of portfolio developers and student users are not taken into consideration. Their research shows that addressing issues of buy-in, motivation, assessment and electronic portfolio technology can increase engagement with portfolios. To improve student and

teacher buy-in, the way electronic portfolios are promoted is extremely important.

Administrators, teachers, students, and anyone else involved in the development process need to see good examples of electronic portfolios, understand their benefits, and know how they will help students to develop as learners. Students are motivated to work on their portfolios when they can see what they will get out of the experience.

As Tosh et al. (2005, online) argue, “Clear rubrics and scaffolding for students on how to reflect so that they internalize the benefits of reflective practice are clearly needed if this approach to learning is going to be embraced by most learners”. Finally, Tosh et al. (2005) document the concerns the individuals in their study had over the electronic portfolio technology they were using. Many had problems with the software, complaining it was anything from too complicated to lacking in functionality. Others express grief of the time taken to learn the software, and to customize it to their needs. They also had concerns over the privacy of their material in a web-based platform, and wanted control over what was publicly accessible and what was private. An electronic portfolio system needs to be extremely flexible so that it can be adapted to fit all levels of technical skill, improvements in their skills and confidence over time. Finally, Lorenzo and Ittleson (2005) provide a list of questions that need to be considered before an institution considers adopting electronic portfolios:

- Should an e-portfolio be an official record of a student’s work?
- How long should an e-portfolio remain at an institution after the student graduates? Should the e-portfolio go with them?
- Who owns the e-portfolio?
- How should an institution promote and support the use of e-portfolios?

- How are e-portfolios evaluated in a manner that is both valid and reliable?
- How can institutions encourage reflection in the design and use of e-portfolios?

Electronic Portfolio Implementation

Success criteria

The successful implementation of the electronic portfolio concept relies on several factors. Teachers and students need to be introduced to the concept and be given clear, articulated reasons for constructing an electronic portfolio (Chang, 2001; Klenowski et al., 2006). The purpose of the portfolio should be clearly connected to the curriculum and goals of the program they are studying (Wetzel & Strudler, 2005). They need to know what types of evidence and how many pieces they should include (Canada, 2002), what the requirements are for reflection and self-assessment (Chang, 2001), and how the portfolio will be utilized and/or assessed. Teachers need to provide encouragement and support to their students (Chang, 2001; Wetzel & Strudler, 2005) to help them through the experience. Studies show that the motivation of students when constructing their portfolios is very important (Al Kahtani, 1999; Chang, 2001; Tosh et al., 2005).

Motivation can be encouraged through enabling student decision-making, ensuring students have ownership of their portfolios, and public access to and recognition of students' work over the web. Likewise, student and educator 'buy-in' to the portfolio concept (Tosh et al., 2005; Wetzel & Strudler, 2005) helps ensure its success. This can be facilitated for students by showing them examples of past electronic portfolios and demonstrating their effectiveness in making learning gains (Abrami & Barrett, 2005), as well as ensuring they have adequate resources and sufficient access to technology to

complete the portfolio (Wetzel & Strudler, 2005). For staff, knowing they have strong and supportive leadership and the necessary resources helps to secure their participation in an electronic portfolio project (Strudler & Wetzel, 2005).

For electronic portfolio systems to be successful, a different set of criteria needs to be met. Ahn (2004) believes that the planning process is a key element of success. Those wishing to implement a system must “critically examine how e-portfolios will be used...and then design or purchase software that addresses those needs” (Ahn, 2004). Ways need to be found to integrate meaningful reflection into the electronic portfolio, to balance standardization with the ability for a system to be flexible enough to respond to student need, and to protect the privacy of those contributing to portfolios (Kimball, 2005). A system needs to ‘stand alone’, without constant nurturing from academic staff (Wetzel & Strudler, 2005).

Finally, institutions need to recognize that implementing an electronic portfolio system is a long-term endeavor (Ahn, 2004) that will be most successful if time is spent in the initial piloting stages before it becomes available program- or institution-wide

(Wetzel & Strudler, 2005). Yancey (2001) neatly summarize the factors necessary for the successful design and creation of an electronic portfolio system in a series of questions:

- What is/are the purpose/s?
- How familiar is the portfolio concept? Is the familiarity a positive or negative?
- Who wants to create an electronic portfolio, and why?
- Who wants to read an electronic portfolio, and why?
- Why electronic? What about electronic is central to the model? Is

sufficient infrastructure (resources, knowledge, commitment) available for the electronic portfolio?

- What processes are entailed: What resources are presumed?
- What faculty development component does the model assume or include?
- What skills will students need to develop?
- What curricula enhancement does the model assume or include?
- How will the portfolio be introduced?
- How will the portfolio be reviewed?

Barriers to implementation

A number of barriers to the implementation of electronic portfolios also exist. Some of the issues from the literature (Canada, 2002; Sherry & Bartlett, 2005; Tosh et al., 2005; Wetzel & Strudler, 2005), the following list has been compiled:

- The need for adequate hardware and software;
- The accessibility of that hardware and software.
- Lack of technology skills amongst students and staff;
- Technical problems with the equipment or electronic portfolio system;
- The need for support when problems are encountered;
- Maintenance of the hardware;
- Adequate storage space and server reliability;
- Demands on staff time;
- How to use students' time efficiently;
- How to overcome issues of ownership and intellectual property;
- Problems with security and privacy of data;

- Lack of features or of control over those features;
- The need for access and permission controls;
- How to transport electronic portfolios into new systems as students move on;
- The need for common standards between different electronic portfolio systems.

Support and technical considerations

The planning and implementation of an electronic portfolio system requires the consideration of a number of technical issues. Before a system can be chosen or specially designed, the reasons for implementing a system, who will use it, and who will be its audience, need to be identified (Heath, 2002). The existing technology skills of staff and students, and the available financial, hardware and software resources (Barrett, 2000; Heath, 2002; Lorenzo & Ittleson, 2005a; McNair & Galanouli, 2002) need to be considered. Electronic portfolio developers have four different options when considering which system to adopt: one designed in-house to meet institution-specific requirements; an open source system freely available over the Internet that either meets requirements as is, or can be readily adapted; a commercially available system that the institution is willing to purchase; or using ‘common tools’ such as Microsoft Word, Internet browsers and so on, to design a portfolio that can then be uploaded to the web or saved to CD-ROM (Lorenzo & Ittleson, 2005a; Strudler & Wetzel, 2005). Whatever the type of system that is chosen, several practical and technical requirements need to be met (Abrami & Barrett, 2005; Barrett, 2000; Barrett & Knezek, 2003; Challis, 2005; Lorenzo & Ittleson, 2005a; Meeus et al., 2006; Siegle, 2002; Tosh et al., 2005):

- A way of organizing content;
- A way of tracking student progress;

- A way of archiving and storing large amounts of data;
- A way of retrieving data;
- How reflective pieces will be linked to artifacts;
- How assessment results will be incorporated into the electronic portfolio;
- A way of publishing the portfolio, so a variety of versions can be produced for different audiences;
- How flexibility for the organization of data will be ensured;
- Which coding language will be used;
- Which technical standards need to be met so the system will communicate reliably with other systems;
- Which file formats will be recognized by the system;
- How security and access permissions will be set;
- How scalability will be ensured so that a large volume of users can access the system;
- How the system will ensure maximum accessibility and usability for users of all levels of skill;
- The inclusion of a wizard tool;
- What kinds of technical support will be available for users;
- How the privacy and intellectual property of users will be protected;
- How long an electronic portfolio will exist in the system: indefinitely, or for an agreed upon length of time after a student graduates;
- How portability will be ensured, so that students can take their electronic portfolio to another institution or choose to maintain it on their own.

MacDonald et al. (2004) warn that “the software used to create the portfolio can constrain or enhance the process and the final product”. Addressing all the above concerns to best meet the needs of students and staff at an institution is essential for the success of any electronic portfolio initiative.

Institutional change and impact

One of the greatest challenges to portfolio implementation is managing the institutional change that arises as a consequence (Carliner, 2005). To be successful, electronic portfolios necessitate that reflective learning practices become embedded in the culture of the institution (Ahn, 2004), which means that programs of study may need to be radically restructured (Challis, 2005). In addition, institutions can be “held open to scrutiny” (Craig, 2003, p. 123) as their students’ work becomes widely accessible via the Internet, so it is in the best interests of management and administration staff to be involved in the planning and implementation phases of an electronic portfolio development. When such change is being established, institutional support is important. (Butler, 2006)

Those in positions of leadership can help to encourage other staff to participate, can provide the necessary technology, financial and human resources, and can foster a collaborative and respectful culture for the development process (Strudler & Wetzel, 2005). As Strudler and Wetzel (2005) argue, “change mandated from administration...can lead to successful change if accompanied by support, training, and an understanding of the change process-Otherwise, top-down change often leads to resistance during implementation”.

Gaps in the literature

Several authors in recent years have identified what they see as gaps in the literature on electronic portfolios. In 2001, Zeichner and Wray considered that more research was needed on the nature and consequences of electronic portfolios over paper-based portfolios, of the nature and consequences of their use for assessment and development purposes, and of the nature and quality of reflection facilitated by such portfolios. Some of these concerns have been addressed in the intervening five years: more research studies on electronic portfolios have since been published (e.g. Brown, 2002; McNair & Galanouli, 2002; Craig, 2003; Smith & Tillema, 2003; Delandshere & Arens, 2003; Lynch & Purnawarman, 2004; Beck, Livne, & Bear, 2005; Ma & Rada, 2005; Milman & Kilbane, 2005; Pecheone et al., 2005; Sherry & Bartlett, 2005; Strudler & Wetzel, 2005; Tosh et al., 2005; Wetzel & Strudler, 2005 Hauge, 2006; Kimball, 2005; Klenowski et al., 2006; Spendlove & Hopper, 2006).

More recently, Barrett and Knezek (2003) want more research on the benefits of electronic portfolios over traditional portfolios, and Smith and Tillema (2003) worry about the long-term impact of portfolios. They argue that “a critical appraisal of the portfolio concept is now needed since, after its origination, the portfolio concept has now been expanded to a range of aims and includes so many functions that its features are becoming blurred or are even contradictory.” Challis (2005) goes even further than this, raising the possibility that electronic portfolios may be a ‘fad,’ or just another gimmick, that will eventually become disreputable, and then abandoned. She says it is hard to find “substantive material about the actual use of e-Portfolios in the higher education sector in a mature and systematic way” (Challis, 2005). Wetzel and Strudler (2005) want research

on large-scale implementations of electronic portfolios, to see whether they live up to their promise.

Purpose

The purpose of this project is to explore the issues in implementing electronic portfolios as a school-wide innovation. The most effective use of this system suggests that the entire school needs to be involved in the preparation, planning, and implementation of the electronic portfolios. Previous research at CID defined the primary goal of the portfolio was its use as a tool for increased parental awareness, communication, and participation in the educational growth and development of their students. Upon further investigation, information obtained through interviews with the coordinators of each department at CID indicated additional areas that needed to be addressed prior to implementation. These areas included: the schools vision, its current assessment system, present parent-teacher education and communication strategies, the use of technology required, and potential logistics issues.

Methodology

Participants

The participants in this study were the coordinators from the Family Center, the Pre-Kindergarten department, and the Upper and Primary School at CID. Two teachers from the Moog Center for Deaf Education, and two teachers from St. Joseph's Institute for the Deaf, also participated in the project. The participants were selected based on their leadership positions at their prospective schools, and their prior knowledge and interest regarding electronic portfolios.

Procedure

This study began by reviewing prior research done on the topic of electronic portfolios. Careful consideration was given as to why further research was needed. It was determined that previous study, (Tomlinson 2008) defined a need and a high-level of interest in the creation of a digital portfolio system for use at CID. A pilot classroom participated in this study and the results were favorable as per parent, teacher, and administrative comments. However, many questions still remained as to how to get this system off the ground since only one class, one teacher, and one department participated. The question that remained was: how could CID implement a school-wide electronic portfolio system, and what other issues still needed to be addressed?

The next step in this process consisted of reviewing literature previously published on the topic of school-wide reform and evaluating these different findings to meet the specific needs of the population at CID. Specific guidelines in regards to the planning, preparation, and development of electronic portfolios were compiled after review of the research. A comprehensive list of resources and applications was also included. Special attention was given to the development process, and was outlined in a step-by-step manner. The use of technology to support the electronic portfolios was critical to the development process

The decision to develop a list of resources to assist with the use of technology and to provide an overall protocol for the future use of electronic portfolios at CID was made by discussing the possible direction of the study with the principal of the Pre-Kindergarten Department at CID. The previous study on the creation of the electronic portfolios piqued the interest of many teachers and administrators; however, they were

unsure of what to do next. They needed a resource that could potentially put the portfolios into action. Putting an electronic portfolio system in place for an entire school requires a great deal of planning, time commitment, resources, funding, and reflection; therefore an actual school-wide implementation was not a viable option due to the time restraints, potential need for funding, and additional training of pertinent personnel for this project. It is hopeful that the information compiled will serve as an effective starting point for the proposed implementation of electronic portfolios at CID.

Once the scope of the study was defined, what followed were in-depth interviews from the coordinators of each department at CID. First the concept of electronic portfolios and its purpose at CID was discussed. Questions involving the school's vision, their current use of technology, present parent-teacher education strategies, and anticipated outcomes were asked. Retrospectively, the interviewees were encouraged to share their ideas of priorities, realistic expectations, and concerns about a school-wide implementation of electronic portfolios.

Other suggestions and valuable input were discussed with four additional participants from two auditory-oral programs in the metropolitan area. The information disclosed included shared experiences obtained from a school reform project initiated several years before when electronic portfolios were first introduced into elementary education. Organization and content of the proposed resource guide was also discussed.

After the interviews were completed, the information was compiled, reviewed, and interpreted. Changes were made to the projected format of the resource guide based on the input gathered from the interviewees. Several issues shaped this decision, such as the technology needed to support the system, the in-service training for teachers and

administrators on how to use the software, the time commitment, and the possible financial implications such a project could create.

Results

Unlike some of the aforementioned most common types and uses for electronic portfolios in the most recent literature, it was determined that the creation of an electronic portfolio system for the future use at CID, could be best described in the school's vision. For the purpose of this study, particular considerations needed to be addressed as to what type of portfolio would be the best fit for a private, specialized auditory-oral school for deaf children. Numerous examples of whole-school digital portfolio reforms in the public school sector exist and many of these projects had federal funding. Common traits among the school included: outlined objectives to be measured, adherence to strict timelines and projected outcomes, as well as proper allocation of the funding and resources. Also, previous research regarding the portfolio process placed a high emphasis on student involvement and encouraged self-reflections of their work to be included. The level of student involvement was not determined as a primary goal for the initial development of the electronic portfolios at CID. However, this may be an area to revisit in the future. Upon review of these school reforms and other contributing factors, it was decided that an informal, less stringent approach was more appropriate for the scope of this project.

The coordinators of each department at CID agreed that the school's vision of a proposed electronic portfolio system would be to combine their previous thinking about the benefits of portfolios, and to develop a protocol specific to the needs of CID. Several suggestions for use: as an informal assessment tool; as a way to enhance parent-teacher, teacher-student, and parent-child communication; as a visual tracking system to record

and evaluate a student's progress over the course of time at CID; as a comprehensive supplement, and record of a student's information. This all-inclusive depiction of the student could include all of their information, yet in an electronic format. Examples include: background information such as birth history, audiometric data and analysis, prior testing, present levels of performance, (PLOP) past /present individualized education plans, (IEP) assessments and rating forms, such as the teacher's assessment of grammatical structures, (TAGS) or CID's developmental checklists; video and audio clips. This is by no means an exhaustive list of artifacts to include, but rather one that could be revised and updated to meet the dynamic world of teaching and technology.

The questions asked to each participant probed for additional opinions, advisements, and realistic views and expectations of the potential school-wide implementation of an electronic portfolio system. The answers to these questions provided valuable data that served as a directional tool for the creation of the handbook. The topics of discussion focused on several issues that could either enhance or detract development, construction, and implementation of such a project. The time commitment, technological skills required, parameters of artifacts to include, security and access provisions, and an overall consensus of 'where to do we begin,' summarizes the concerns of each participant.

Another implication for possible consideration centered on CID's present parent-education and communication strategies. Although these strategies varied between the three different departments-the Family Center, the Pre-K, and the Upper and Primary School, each coordinator acknowledged that parent-teacher communication is a vital component of their program that continues to improve. Currently, communication logs,

face-to-face contact, email correspondence, phone calls, parent-teacher conferences, and parent education workshops are their primary modes of communication with the parents of the students enrolled at CID. By developing an electronic portfolio for each student, these strategies could be streamlined into one medium to minimize the multiple avenues currently used. However, this would, in turn, present barriers for those parents who do not currently have access to the Internet, and would decrease the effectiveness of the parent-teacher relationship. Further discussion on this idea proposed a potential Internet portal or kiosk on CID's property specifically for direct access to the electronic portfolio system. While this may be a long-term goal for the school, it is not included as an essential component for the initial development of the e-folio.

The coordinator for the Family Center suggested that video and audio clips are an attractive feature of the project and that they should be a more focused event in her department. She rationalized that many parents are not able to view some of their children's major milestones by way of the observation rooms adjacent the toddler classrooms, due to a variety of reasons. "What a wonderful gift we could give the parents by having these moments on record, ready for their viewing with a click of a button." She continued by emphasizing how this multimedia could also be used during parent-teacher conferences, parent workshops, transition meetings, and for further demonstrations of specific skills obtained.

The potential advantages and disadvantages of the process of implementing an electronic portfolio were also noted. Although the answers varied, several were interrelated, and provided an added insight to the possibilities of what could be the technological future of CID. The Pre-K coordinator stated that, if implemented, the e-

folio would be a great tool to showcase the student's information, an organized way to have everything in one place, and a motivator for the administrators to enhance their technology skills. The Primary School coordinator added that she would like to see more research done in this area to help ease the implementation process, so that more schools could incorporate this innovative piece of technology. The progress that could be recorded and tracked over a year's time, the parent education component, and the potential to use the portfolio artifacts for individualized family service plans, (IFSP) and conferences, were three of the top advantages according to the coordinator of the Family Center.

Some of the disadvantages included concerns about the personnel available, the time commitment, the cost and training required for the preliminary set-up, the legal implications and the adherence to the Family Educational Rights and Privacy Act, (FERPA) and the Health Insurance Portability and Accountability Act, (HIPPA) policies, and thoughts about the whole-school 'buy-in' process. How many teachers and administrators would initially agree to the collaboration for the project, and how many would actually actively participate? How many teachers are willing to increase their workload during the implementation process? These issues and concerns coincide with the previous research cited.

Discussion

The focus of electronic portfolios must be on learning, not on the technology used to facilitate that learning: e-Portfolios will be worth the effort if, and only if, we use them to improve important activities in academic life. To put it another way, we need to shift our focus from the e-Portfolio software itself – its features, its reliability, and so on – to

the activities and outcomes for which that software is to be used (Ehrmann, 2006).

Electronic portfolios influence student learning through the process of construction and through collaboration with and feedback from academic staff (Lynch & Purnawarman, 2004). In fact, for Chang (2001), discussions between students and their teachers lie at the core of the portfolio methodology. This requires academic staff to be as committed to and involved in the portfolio process as their students. Through this collaboration of professionals, from administrators all the way down to the students, one could only hope that this level of commitment carries over into the home as well.

Conclusion

If properly implemented and utilized well, electronic portfolios can be a powerful tool for capturing student learning. Through the process of constructing an electronic portfolio, teachers can utilize this collection of information to evaluate their student's progress over time, reflect on their own teaching strategies, enhance parent-teacher communication, provide visual documentation of the student's attainment skills, or lack of, for various placement options to other professionals. As students become more of an active participant in the development of these portfolios, they can learn to apply reflective thinking to their experiences, thus generating meaning and recognizing the next steps they need to take on their learning journey. If only narrowly considered as a way of organizing student work, then electronic portfolios will truly fail to help students learn.. To be successful users of electronic portfolios, administrators, teachers, students, and parents alike need to understand the reasons for constructing a portfolio, be given clear guidelines, and have access to an electronic portfolio system that is easy to use and gives them as much flexibility or as much structure as they require. The academic staff needs to

be committed to the portfolio process, and willing to give regular and useful feedback on the quality of work, time and effort devoted to the portfolios. Institutions need to be aware of the impact that an electronic portfolio development will have.

The type of portfolio required, its purpose and its audience need to be clearly articulated. Students and academic staff using an electronic portfolio system need the time, skills and resources to do so successfully. “Institutions need to provide strong leadership to encourage their staff to participate in an electronic portfolio development, whilst also enabling collaboration and staff input into decision-making. Institutions also need to recognize that the process of implementing an electronic portfolio system is a long-term one, and it may take several years before the full benefits will be seen,” (Butler 2006).

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Appendix A

Create your own electronic portfolio using common software tools

	Stage 1	Stage 2	Stage 3	Stage 4
Evidence	Collections of: -Background information -Prior testing -PLOP, IEP, IFSP & other pertinent documents -Artifacts -Reproductions -Audio& video clips and captions	Productions including: -goal statements -reflective statements	Classroom audio, video, or other digital artifacts	Selective documents that provide a clear picture of individual competencies
Reflections	Focus on individual artifacts	Focus on attainment of projected goals	Overall reflection on portfolio	Highlights of the program implementation
Software to be used	Microsoft Word + any other used Excel for “Portfolio at a Glance”	Microsoft Word + any other used Excel for “Portfolio at a Glance” Convert artifacts into Acrobat PDF files	Convert all documents to Acrobat Merge into single PDF file, create hyperlinks Create digital movie from video or still images	Power Point Convert to Acrobat, merge into document Write to CD-ROM, videotape, DVD, and/or web server
Publishing Format	Local hard drive Jump drive Zip disk Internet server	Local hard drive Jump drive Zip disk Internet server	Local hard drive Jump drive Zip disk Internet server	CD-ROM DVD www.-based server

Electronic Portfolio Development Overview (Helen Barrett, 2002)

The chart above is a summary of the process of developing an electronic portfolio.

Should it be decided to follow this framework, additional information can be found on Dr. Helen Barrett's website. She has devoted much time and effort to this electronic portfolio process. Full citation of her work is listed on the works cited page.

(Revised from Dr. Helen Barrett's conceptual framework to fit the needs of this study)

Appendix B

Selection of software and converting work into digital format

You can use **Adobe Acrobat 7.0** to convert a file from virtually any application to a Portable Document Format (PDF), including both print and electronic documents. PDF documents are “read only” documents that other users can view regardless of the original file format.

Adobe Conversion Methods

When converting a document, it is important to choose the best method for the application. Here are some basic steps which should work for transferring most document types into PDF:

Note: when opening a non-PDF file, Acrobat needs the native application of the non-PDF file to translate it successfully.

1. Create PDF Menu - Choose **File**, go to **Create PDF**, and then choose from the menu available. This menu is also available by clicking the **Create New PDF** button at the top-center of your screen. On the **Create New PDF** menu, you are given several options:

- You can browse for any file type using the **From File** option, this option does not work for word-processed documents.
- You can merge multiple files using the **From Multiple Files** menu option. You will be able to browse for several different files by clicking the Browse button.
- A newer feature available through **Adobe Acrobat 7.0** is the option to create a **PDF From Web Page**. This requires knowledge of the URL, and also an Internet connection, unless the HTML file is saved locally, in which case it requires knowledge of the file’s location. Also, certain images from an online web page may or may not be included, so you may need to insert those images separately.
- If there is a scanner installed and attached to your computer, you can scan a picture or document directly into PDF by using the **From Scanner** option. The option to import from scanner is available on any ITRC scanning station computer.
- If you want to import an image to PDF, you can copy that image to the clipboard by going to **Edit** then **Copy**. You can then use the **From Clipboard Image** option.

Convert Your Print & Electronic Files to PDF (Acrobat 7.0)

PDF-Writer - use this method with text documents from virtually any program. Convert your documents using your print options menu.

For that, open the document then go to:

1. **File/Print** then under drop down **Name**,
2. Select **Adobe PDF** and hit **OK**. This will display your document into PDF format.

Note: Microsoft products offer the PDF-Maker plug-in. In the PDF-Maker menu, select the PDF-Writer option when converting your document.

Adobe PDF (Microsoft Office) – Microsoft Office programs have a special integration with Adobe Acrobat that creates a special menu for Acrobat conversion once Acrobat has been installed.

This menu should appear in all Microsoft Office programs right after the **Help** menu.

To use this menu to convert to PDF:

1. Simply click **Adobe PDF**
2. Then **Convert to Adobe PDF**.

Adobe has is an **Optical Character Recognition (OCR)** conversion utility. Use this utility for images and documents that require editing text. The OCR can convert imported files into text documents using one of the following methods:

- **Scan a document into Acrobat.**

1. Select **Document**
2. Go to **Recognize Text Using OCR**
3. Then click **Start**.
4. Click on **OK** to convert your document.

- **Import an image into Acrobat.**

1. Click **Document**
2. Go to **Recognize Text Using OCR**
3. Then click **Start**. Click on **OK** to convert your document.

Note: When scanning documents or images. The capture plug-in requires the resolution to be 200 ppi or higher.

When opening Acrobat 7.0, the toolbars may not be visible.

- **To open a tool bar:**

1. Select **View** from the main menu bar
2. Then select **Toolbars**.
3. Choose the toolbar item you wish to view (i.e. Adobe Online, Basic Tools, Commenting, Editing, File, etc.)

Retrieved from:

Editing Tools for Adobe Acrobat 7.0 Idaho State University Campus Box 8064 Pocatello, ID 83209
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Appendix C

Commercial Products and Services

The following list of resources was compiled from the data found in the literature. Special consideration should be given to the reliability of hyperlinks as time passes-some remain live and active, while others are given new html addresses, or additional revisions are made. This compilation should be used as a general starting point when beginning the portfolio creation process.

E-folio Vendors

Chalk & Wire

<http://www.chalkandwire.com>

LiveText

<http://www.livetext.com>

TaskStream

<http://www.taskstream.com>

LearningQuest

http://www.lotilounge.com/ep_demo_1/

Aurbach_&_Associates

<http://www.aurbach.com/>

McGraw-Hill

[Folio Live website](#)

[Foliolive demo](#)

ProfPort

<http://portfolio.ilstu.edu/profport/>

<http://www.folioworld.com/>

Folio by e-portaro

<http://www.eportaro.com>

Concord (a digital content server for Blackboard systems)

<http://www.concord-usa.com>

iWebfolio by Nuventive now in a strategic alliance with SCT

<http://www.nuventive.com/index2.htm/>

FolioTek from Lanit Consulting

<http://www.foliotek.com>

My Classroom Helper (K-12 market)

<http://www.myclassroomhelper.com/>

E-Portfolio by www.opeus.com (an e-portfolio in the U.K.)

<http://www.opeus.com>

Pupil Pages

<http://www.pupilpages.com/>

Portfolio Resume.net

<http://www.portfolioresume.net/>

FolioMaker by Folios International

<http://www.foliosinternational.com/>

MyPortfolio by Myinternet, Limited, an Australian company - focused on K-12 schools

<http://www.myinternet.com.au/products/myportfolio.html>

PaperFree Systems - a system to maintain NVQs in the UK (measurements of occupational performance against national standards)

<http://www.paperfree.co.uk/>

Pass-Port - originally developed for the Louisiana Department of Education

<http://www.pass-port.org/>

TK-20

<http://www.tk20.com/home/index.html>

Pebble Pad

<http://www.pebblelearning.co.uk/>

EdCube

<http://www.edcube.net>

Open Source Portfolio Systems

Open Source Portfolio Initiative (OSPI)

<http://www.theospi.org>

University of Minnesota's e-portfolio contributed to the Open Source Community

<http://sourceforge.net/projects/ospi/>

E-Portfolio.org provided by the Connecticut Distance Learning Consortium (CTDLC) with 11 partner institutions of higher education

<http://www.eportfolio.org/>

Mahara (developed in New Zealand)

<http://en.wikipedia.org/wiki/Mahara>

<https://eduforge.org/projects/mahara/>

<http://myportfolio.ac.nz/>

Moofolio (developed by SPDC in New Hampshire)

<http://moodle.spdc.org/moofolio/>

P-nelope

<http://sourceforge.net/projects/p-nelope/>

Marvelous CMS

<http://sourceforge.net/projects/marvelous/>

Klahowya Student Portfolio Solution

<http://sourceforge.net/projects/klahowya2/>

IUPportfolio (from Sweden)

<http://sourceforge.net/projects/iupp/>

Cyberfolio

<http://sourceforge.net/projects/cyberfolio/>

PortEd!t

<http://sourceforge.net/projects/port-edit/>

Music Portfolio Manager

<http://sourceforge.net/projects/music-port-mgr/>

Portfolio Manager (for artists)

<http://sourceforge.net/projects/portfolios/>

K-12 examples

Mt. Edgecumb's electronic student portfolios digital learning portfolio research

<http://www.mehs.educ.state.ak.us/portfolios/portfolio.html>

Many examples of student portfolios from Mt Edgecumb, Alaska's boarding school for rural high school students.

Electronic Portfolio Home Page

<http://longwood.cs.ucf.edu/~MidLink/elec.port.hp.html>

A page that describes several middle school electronic portfolio projects published by Midlink online magazine.

Susan Silverman's electronic portfolios for her students (four years).

<http://kids-learn.org>

Electric Teacher examples :

<http://www.electricteacher.com/onlineportfolio/examples.htm>

Commercial electronic portfolio/assessment resources

Aurbach & Associates

<http://www.aurbach.com/>

The home page for the developers of The Grady Profile. Download demos and get lots of information about alternative assessment and electronic portfolios. Online demo available to download for Macintosh.

Roger Wagner's page on Creating Electronic Portfolios with HyperStudio

<http://www.hyperstudio.com/showcase/portfolio.html>

Includes links to sample portfolios created in HyperStudio
-and a PDF file information booklet entitled, "Using the VCR as a Printer for HyperStudio Projects" located online at:

<ftp://www.hyperstudio.com/resource/library/VCRPrint.pdf>

Superschool Software's Portfolio Assessment Kit

<http://www.superschoolsoftware.com/>

Forest Technologies web site

<http://www.foresttech.com/>

Publishers of Designer Software for Learning "Portfolio Assessment Toolkit" designed by Karen Peterson and Scott Mengel,
Peakview Elementary School - HyperStudio templates for different age levels

Electronic Portfolios

<http://electronicportfolios.com>

Training and Consulting on Electronic Portfolio Development through presentations in-person, on videotape, or using Internet-based technologies.

Commercial references

Portfolios and Self-Assessment

<http://www.hmco.com/hmco/school/rdg/res/literacy/assess7.html>

Houghton Mifflin's Education Place - brief discussion plus link to references on assessment

Student Self-Assessment

<http://www.hmco.com/hmco/school/rdg/res/assess/index.html>

Houghton-Mifflin's Education Place, included links to several brief discussions of students as active partners, self-assessment methods and self-assessment opportunities

Resources

ERADC – e-Portfolio Research and Development Community

<http://www.eradc.org/>

A website established by a doctoral student at the University of Edinburgh

LIFIA website

<http://www.lifia.ca/>

Canadian non-profit organization with a focus on electronic portfolios; sponsors of the e-Portfolio Canada conferences

Consumer Guide to ePortfolio Tools and Services

<http://www.europortfolio.org/>

developed by FuturEd. Europortfolio website & by Eifel - European Institute for eLearning sponsors of the EuroPortfolio conferences

FuturEd website

<http://www.futured.com/>

Established by educational futurist Kathryn Chang Barker

School Odyssey -

<http://www.ideasconsulting.com/>

<http://home.att.net/~digitalportfolio/>

David Niguidula and Hilarie Davis' web sites on digital portfolios

Feasible Electronic Student Portfolios: Global Networking for the Self-Directed Learner in the Digital Age

http://www.mehs.educ.state.ak.us/portfolios/why_digital_portfolios.html

Todd Bergman's excellent article on using portfolios to support self-directed learning.

Creating Electronic Portfolios

<http://www.ash.udel.edu/ash/teacher/portfolio.html>

A very nice article that summarizes the reasons for creating and using electronic portfolios.

Martin Kimeldorf's Portfolio Library

<http://amby.com/kimeldorf/portfolio/>

A comprehensive guide to the author's work and books on portfolio development.

The National Center for Research on Evaluation, Standards, and Student Testing.
CRESST Home Page

<http://www.cse.ucla.edu/>

Links to all their publications in .pdf (Adobe Acrobat -- portable document format)

Appendix D

Professional Development Recommendations

1. **Attend a workshop.** Listed below is only one example, and an inside look at what to expect from attendance; there are numerous seminars nationwide regarding electronic portfolio development and implementation.

Create Your Own Electronic Portfolio Handbook:

A three day workshop conducted

by Dr. Helen Barrett

Abstract: Work in a collaborative team to learn what an electronic portfolio can be, how it compares to a paper-based portfolio strategy, and how to make the transition to using technology to support this type of assessment. This workshop is designed to help Schools of Education to plan curriculum and infrastructure adaptations to successfully implement electronic portfolios which demonstrate INTASC and ISTE NETS-T standards, and to develop a CD-ROM-based Handbook to duplicate for their students.

Workshop Description: As we move to more standards-based teacher performance assessment, we need new tools to record and organize evidence of successful teaching, for both practicing professionals and student teachers. This workshop will introduce a variety of strategies for implementing Electronic Teaching Portfolios in a Teacher Education program. Participants should bring copies of their curriculum (course outlines/syllabi) along with the standards they want to demonstrate with their portfolios. The results of the three-day-long activity is a handbook that covers the type of electronic

portfolio development most appropriate for the individual program, and a plan for training and implementation.

Objectives: Participants will become aware of the various strategies for authoring electronic portfolios and design a handbook to integrate electronic portfolios across a teacher preparation program. Participants will design training materials for creating basic electronic portfolios with common software tools.

Description of major activities

Electronic Portfolio Development: Participants will become aware of various strategies for building digital portfolios through all five stages of Electronic Portfolio Development, including CD-ROM production or posting to a web site. Participants will design customized training materials and will create their own CD-ROM-based Electronic Portfolio Handbook. This workshop is limited to six development teams (2-3 people per team).

Workshop Requirements	
Workshop facility:	<ul style="list-style-type: none"> • Computer lab with multimedia-capable computers (Macintosh, Windows computers or both) OR room with laptop computer for every participant • CD Recorders with software • Scanner • VGA Projection system for presenter's Macintosh Powerbook (<i>optional</i>: additional projector & screen connected to Windows computer) • Speaker connections for presenter's computer

Internet Access:	<ul style="list-style-type: none"> • Ethernet or wireless (Airport) • DHCP or fixed IP for presenter's computer
Software -- Required:	<ul style="list-style-type: none"> • Microsoft Office • Adobe Acrobat 5.0 • a web browser • Video production software (iMovie or other) • Screen capture or recording software (Macintosh: Snapz Pro 2) (Windows: Camtasia or other) • Audio Editing software (with high quality microphone) (Macintosh: Sound Companion) (Windows: Sound Forge?) • QuickTime Player Pro (either platform)
Workshop Outline	
Day 1 Morning <i>"Why?"</i>	Introductions, overview of workshop Collections activity Introductory Presentation <ul style="list-style-type: none"> • Initial team planning activities
Afternoon <i>"How?"</i>	<p>Leader Presentation: Creating the electronic portfolio handbook</p> <ul style="list-style-type: none"> • Various strategies for authoring electronic portfolios • Examples of electronic portfolios • Become aware of the electronic portfolio development process (3 hours) <p>Hands-on: Explore portfolio websites based on bookmarks and links and CD-ROM explore the process by completing the EP Planning worksheet (on CD-ROM). explore use of Microsoft Word/Excel as a portfolio tool</p> <p>Leader Presentation and discussion: Managing Complex Change</p> <p>Group discussion: Developing a Vision for Electronic Portfolio Development</p> <p>Group work: Creating the Electronic Portfolio</p>

	<p>Implementation Plan (using Inspiration or PowerPoint)</p> <p>First Evening: no-host dinner at a nearby restaurant</p>
<p>Day 2 Morning</p> <p>"So What?"</p>	<p>Group Presentation: Why/How do we want to implement electronic portfolios?</p> <p>Leader Presentation: Planning for implementing electronic portfolios in the curriculum</p> <p>Discussion: Where is the e-portfolio introduced in the curriculum?</p> <p>Does the curriculum require appropriate digital artifacts for electronic portfolio?</p> <p>Is there a course to support students finalize their portfolios?</p> <p>What technology skills do students need?</p> <p>Group work: Curriculum integration planning and Electronic Portfolio Handbook design (finalize Inspiration chart or PowerPoint presentation)</p>
<p>Day 2 Afternoon</p> <p>"Now What?"</p>	<p>Group Presentations: Basic design/plan for Electronic Portfolio (Inspiration or PowerPoint)</p> <p>Hands-On: Planning to customize an Electronic Portfolio Handbook to meet a program's specific needs. Identify resources needed for a CD-ROM or website, create customized "step-by-step" training materials</p> <p>Skill Development: Learn to create "atomiclearning.com-style" demo screen recordings with Camtasia (Windows) or Snapz Pro2 (Macintosh) OR Learn how to convert documents to Acrobat.</p> <p>Second Evening: Individual Team Meetings</p> <p>Homework: Create DRAFT Table of Contents for Handbook and tasks to complete upon return to home campus.</p>
<p>Day 3 Morning</p>	<p>Group Work session: Preparing the Table of Contents and Work Plan</p> <p>Group Discussion: Evaluating the Electronic Portfolio reviewing rubrics and examples. Strategies for assessing individual and program outcomes.</p>
<p>Day 3 Afternoon</p>	<p>Group Presentations: Basic design for Electronic Portfolio Handbook with draft Table of Contents -</p>

	<p>Finalize handbook/plan and present to large group</p> <p>Share evaluation strategies</p> <p>Presentation: Final Words Workshop Wrap-up, Evaluation and Adjournment</p>
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2. Schedule an appointment for a commercial vendor to visit your institution.

-Gives administrators a holistic look at the options available, the opportunity to compare costs from institution created portfolios versus commercial based vendors, and a means of comparing the two.

-Selection of commercially-based portfolio can reduce time involved in initial implementation, and may help increase ‘buy-in’ from all individuals involved due to the minimized time, stress, and frustration associated with ‘starting from scratch.’

(See list of commercial vendors in Appendix C)

3. Stay current on the latest research and technology about electronic portfolios

Recommended Readings

Moss P.A., Sutherland, L.M., Haniford, L., Miller, R., Johnson, D., Geist, P.K., Koziol, S.M., Star, J.R., Pecheone, R.L., (2004, July 20). Interrogating the generalizability of portfolio assessments of beginning teachers: A qualitative study, Education Policy Analysis Archives, 12(32). Retrieved September 2, 2008 from <http://epaa.asu.edu/epaa/v12n32/>

Riconscente, M., (2004) Digital Portfolios: An Enduring Promise for Enhancing Assessment , http://www.techlearning.com/db_area/archives/WCE/archives/mricons.htm
-An article reviewing her work with the Coalition of Essential Schools

Schutz, A., Moss, P.A., (2004, July 20). Reasonable decisions in portfolio assessment: Evaluating complex evidence of teaching, Education Policy Analysis Archives, 12(33). Retrieved [date] from <http://epaa.asu.edu/epaa/v12n33/>

Tosh, D. and Werdmuller, B. (2004) "e-Portfolios and web-logs: one vision for e-Portfolio development." Retrieved September 2, 2008 from:
http://www.eradc.org/papers/ePortfolio_Weblog.pdf

Tosh, D. and Werdmuller, B. (2004) "Creation of a learning landscape: web-logging and social networking in the context of e-portfolios." Retrieved September 2, 2008 from:
http://www.eradc.org/papers/Learning_landscape.pdf

Electronic Portfolio Design

<http://www.mtsu.edu/~itconf/proceed01/20.html>

An article on deciding which publishing format works best in this institution's situation

Grady Profile Glossary - alternative assessment

http://www.aurbach.com/alt_assess.html

A series of definitions and links to useful information about alternative assessment.

Role of assessment in mathematics

<http://seamonkey.ed.asu.edu/~vito/jim.html>

Role of assessment in mathematics - an article that addresses different types of assessment. Great guidelines for creating electronic portfolios in mathematics.

Electronic Portfolio Assessment Tool

<http://seamonkey.ed.asu.edu/~vito/icme.html>

Electronic Portfolio Assessment Tool - Guidelines for students to be able to create their own electronic portfolio gathered from learning experiences.

Assessment: Let's See What Our Kids Can Do

<http://www.technos.net/journal/volume1/4baker.htm>

Article by Eva Baker (UCLA) from Technos: Quarterly for Education and Technology, Winter 1992

Student Portfolios: Classroom Uses

<http://www.ed.gov/pubs/OR/ConsumerGuides/classuse.html>

U.S. Department of Education Office of Educational Research Consumer Guide, November, 1993.

Student Portfolios: Administrative Uses

<http://www.ed.gov/pubs/OR/ConsumerGuides/admuses.html>

U.S. Department of Education Office of Educational Research Consumer Guide, December, 1993.

Reflection Sites

Site on Reflection in Education

<http://www.infed.org/biblio/b-reflect.htm>

ERIC Trends and Issues Alerts paper on "Teaching Critical Reflection" by Imel
<http://www.cete.org/acve/docs/tia00071.pdf>

North Carolina Public Schools site on the Reflection Cycle - "Self-Assessment: The Reflective Practitioner"
<http://www.ncpublicschools.org/pbl/pblreflect.htm>

Anne Friedrichs' Continuous Learning Dialogues: Abstract
<http://www.uvm.edu/~afriedri/dialogueabstract.html>

Jenny Moon's discussion paper "Reflection in Higher Education Learning" (download RTF file)
http://www.ltsn.ac.uk/application.asp?app=resources.asp&process=full_record§ion=generic&id=72

MIT's Center for Reflective Community Practice description of What is Reflective Practice [PDF]
<http://crp.mit.edu/documents/whatis.pdf>

NCREL's Self-Assessment in Portfolios
<http://www.ncrel.org/sdrs/areas/issues/students/learning/lr2port.htm>

"Design and Analysis of Reflection-Supporting Tools in Computer-Supported Collaborative Learning" by Seung-hee Lee
http://www.itdl.org/Journal/Mar_05/article05.htm

Documenting Student Success: The Development of a Learner Portfolio by Nova Scotia Department of Education
<http://www.nald.ca/alacbc/projects/portfolio.htm>

"Upon Further Reflection, a Few Random Thoughts" New York Times, August 30, 2006 (registration required to read article)
<http://www.nytimes.com/2006/08/30/education/30education.html?ei=5070&en=156be81e2815bd2f&ex=1159243200&pagewanted=print>

Whole School Reforms: Coalition of Essential Schools

Coalition of Essential Schools: Welcome
<http://www.essentialschools.org>

The main home page for the Coalition of Essential Schools

The Digital Portfolio: A Richer Picture of Student Performance
http://www.essentialschools.org/pubs/exhib_schdes/dp/dpframe.htm

The HTML version of an excellent CD-ROM produced by David Niguidula on the research conducted by the Coalition on digital portfolios in five different schools.

[Technology in the Essential School: Making Change in the Information Age](http://www.essentialschools.org/pubs/horace/10/v10n03.html)

<http://www.essentialschools.org/pubs/horace/10/v10n03.html> - Horace: vol. 10 no. 3

[Demonstrating Student Performance in Essential Schools](http://www.essentialschools.org/pubs/horace/14/v14n02.html)

<http://www.essentialschools.org/pubs/horace/14/v14n02.html> - Horace: vol. 14 no. 2

[Show, Don't Tell: Video and Accountability](http://www.essentialschools.org/cs/resources/view/ces_res/229)

http://www.essentialschools.org/cs/resources/view/ces_res/229

A research paper on the use of video and accountability.

[The Digital Portfolio: A Richer Picture of Student Performance](http://www.essentialschools.org/cs/resources/view/ces_res/225)

http://www.essentialschools.org/cs/resources/view/ces_res/225

A research paper on the Coalition's design of a digital portfolio under development at several schools.

[The New York Assessment Collection Web Version: Table of Contents](http://www.essentialschools.org/pubs/exhib_schdes/nyac_web/toc.htm)

http://www.essentialschools.org/pubs/exhib_schdes/nyac_web/toc.htm