

## Part One

# Graduate Student Perspectives on the Development of Electronic Portfolios

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### What is a portfolio?

The word “portfolio” might bring to mind the artist’s case bulging with sketches, samples and finished or unfinished works in no particular order. On the other hand, it might suggest the familiar collection of report cards, crayon drawings and dioramas that accumulate in schoolchildren’s homes over the years. In an adult education setting, however, a portfolio is a selective group of artifacts, placed in context within a carefully constructed user interface. Whether the interface is electronic, paper-based or some combination of the two is not important, what is crucial is that the artifacts have been chosen and arranged with thought and purpose.

The portfolio can be created for any number of uses. It might be a graduation requirement, pointing out how the learner has demonstrated competence in various assessment areas. It might be geared toward a forthcoming job search. It might be a showcase of an individual’s strengths with different kinds of art or media production. It might even serve as a simple act of self-assessment and reflection at a personal crossroad. What all these purposes have in common is that they result in “...a powerful tool for demonstrating growth over time which is the primary value of a portfolio” (Barrett, 2000).

Knowing how to create an electronic portfolio is a beneficial skill in today’s job market. Portfolios are defined as “organized, goal driven documentation of professional growth and achieved competence” (Cambell, Cignetti, Melenzyer, Nettles & Wyman, 1997, p. 3). Kimball (2002)

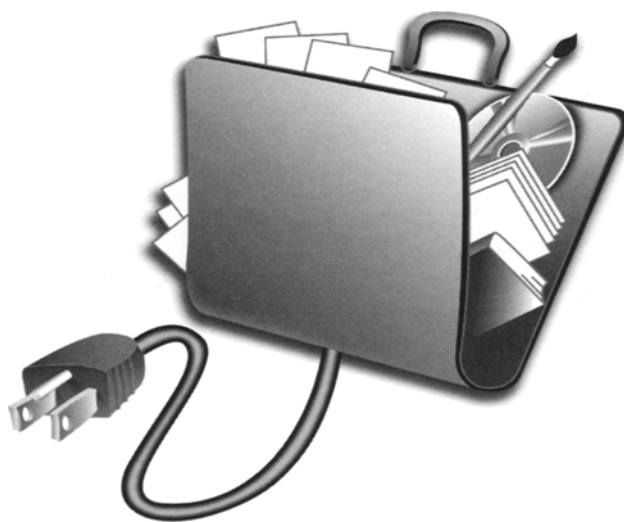
further defines portfolios as a “reflective collection of work.” Merriam-Webster defines portfolios rather narrowly using properties of their physical appearance (bound cover and pictures). Recently, advances in technology and personal computers expand the range of formats to include electronic media. An electronic portfolio allows one to store and display

documents in an electronic format. We define electronic portfolios as multimedia environments that display artifacts and reflections documenting professional growth and competencies. This two-part article explores graduate student design and development of electronic portfolios during a one-semester course. This first paper describes portfolios; their classification in current literature and the development process students used in this class. The second paper is a

reflective case study of how students implemented the ADDIE model when creating portfolios.

### Current trends in electronic portfolio development

Artists, architects and writers have long used portfolios. Recently portfolios have gained importance in the educational field. Students have the opportunity to “collect, select, and reflect” (Barrett, 2000) on their work. As an instructional activity, portfolio design involves problem solving, writing, researching and analyzing. These are active and learner-centered activities and reflect the current trend towards constructivist learning environments (Bayles-Martin, 1999).



## Benefits of electronic portfolio development

Developing the electronic portfolio not only demonstrates past growth and learning, but also generates learning in and of itself. The processes of deciding upon the portfolio's purpose, analyzing its audience, examining and selecting artifacts to be included, and designing and constructing the electronic interface, all serve to create new knowledge based on old experiences. The creator has an opportunity to use artistic and technical skills as well as to make new links between otherwise unrelated items, which is, of course, the essence of learning.

The reflective activity involved in portfolio design helps students see connections between course projects and non-academic projects. By assimilating artifacts in one place, learners are able to organize and make easily accessible a variety of documents that might otherwise be difficult to display. Students also learn how to present information to a specific audience, an important communication skill.

## Electronic portfolio types

When creating a portfolio, students learn to communicate to a specific audience and to consider the type of portfolio most suitable to their goals. Kimball (2003) defines four kinds of portfolios: working, academic, professional, and presentation.

### The working portfolio

The working portfolio is the basis or springboard for the academic, professional or presentation portfolio. These stages are interconnected and evolve as the developer moves through the development stages. These stages do not end at a definitive point in time; rather, the process expands and moves forward throughout the professional development process (see Figure 1).

Campbell, Cignetti, Melenyzer, Nettles & Wyman (2001, p. 3) define the working portfolio as an "On-going systematic collection of selected work in courses ... [that] forms a framework for self-assessment and goal setting." Artifacts should be representative samples that can demonstrate achievement and development. From this working portfolio, artifacts are selected to be included in the academic, professional or presentation portfolio. "The selection criteria should reflect the learning objectives that the portfolio is demonstrating" (Barrett, 2000).

### The academic portfolio

The academic portfolio is a collection of work conducted in academic settings. Two categories of academic portfolios include student portfolios and teacher portfolios. Student portfolios display selected projects from coursework. Two objectives drive student portfolios. One objective looks back and the other looks forward. Looking back involves reflecting on achievement and learning. Looking forward involves identifying gaps and future development opportunities based upon reflection. Teacher portfolios display examples of student achievement, opportunities for growth as a teacher, examples of how standards have been implemented and so on. As with student portfolios, both past and future reflection is an element of teacher portfolios.

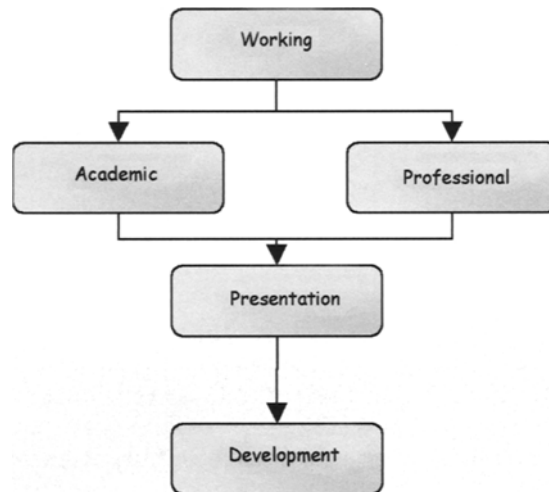


Figure 1. Electronic portfolio development stages

### The professional portfolio

The professional portfolio emerges from the working portfolio by bringing the selected artifacts into a unified medium with organized hyperlinks moving the viewer through the portfolio in a logical manner. The hyperlink structure should move the viewer through the goals, reflections and work samples in a clear and concise manner to enhance the artifacts and the portfolio as a whole. This is also the type of portfolio that allows the developer to make professional development decisions. From this portfolio, the developer can refine the portfolio contents to a presentation portfolio directed toward a specific career goal or ascertain growth areas for further education and study.

### The presentation portfolio

The presentation portfolio's key objective is to help the creator secure employment by demonstrating/displaying competencies and skills to prospective employers. The academic or the professional portfolio can be distilled into the presentation portfolio. The portfolio in this capacity acts as a demonstrative résumé or vita.

### The process of developing

Barrett (2000) identifies five key stages in electronic portfolio development:

1. defining the goals and context of the portfolio
2. establishing a working collection of artifacts for a working portfolio
3. selecting representative artifacts to filter to a reflective portfolio

4. organizing the artifacts into an electronically connected portfolio
5. preparing the artifacts in an appropriate medium for the presentation portfolio

As pointed out in the beginning of this article, the portfolio is a tool to document professional development. The continuing professional development process can be seen as the sixth stage of portfolio development. This process will follow portfolio developers throughout their professional careers (see Figure 2).

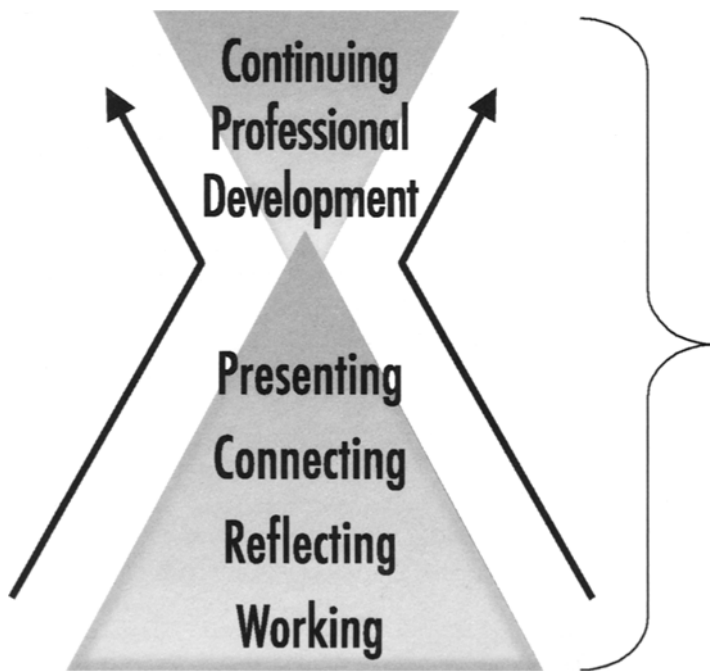


Figure 2. Portfolio Development Stages

The defining stage involves stating the overall goal of the portfolio, creating a framework and identifying the resources (such as software) for creating the portfolio. The working stage involves the collection of artifacts based upon objectives. The reflecting stage involves communicating the value of the artifacts to the developers' past and future development. By reflecting on the artifacts, the developers refine and clarify the meaning of, and reason for, inclusion of each element in the portfolio. By this reflection process, developers avoid the pitfall of making the portfolio a haphazard collection or scrapbook, but rather create a reflective tool that demonstrates growth over time and serves as documentation of professional development. The connecting stage requires portfolio developers to create an environment where patterns are identified between goals and artifacts. The presenting stage involves storing the portfolio in a digital medium and sharing it with the appropriate audience.

As the portfolio moves from a working collection of artifacts to an organized portfolio, the developer must select software development tools most appropriate for the desired portfolio context. Barrett (2002) reminds us that the software

used to create the portfolio can constrain or enhance the process and the final product. Upon selection of the medium the artifacts can be converted, where necessary, to digital format. At this point, the interface will be developed to make a cohesive and organized navigation path through and among the artifacts. The developer determines the navigation structure of the portfolio in consideration of the end goal for the portfolio.

## Overview of reflection and artifact development

There are two key elements in a portfolio: reflection statements and artifacts. Reflection is a key component in portfolio development. It requires developers to think about what they are doing, why they are doing it, what the outcomes are and how the information can be used for continuous improvement (Mclaughlin & Vogt, 1998). In general, good web portfolios show that the author has paid attention to what words say and imply to the reader. In a web portfolio, a reflective statement usually appears before the reader sees the artifacts. For example, reflective statements can appear on the homepage, where the author introduces the portfolio as a whole and looks back on the entire period in which the artifacts were created. Reflective statements can also appear on separate reflection pages, where the author introduces the individual artifacts (Kimball, 2002, p.22).

### Steps for writing reflective statements

There are several ways people can write and organize reflective statements. Brown and Irby (2001) recommend the use of a specific process for structuring and developing reflective comments. The process involves five steps:

1. Select the artifact.
2. Describe the circumstances (who, what, where, when) surrounding the artifact.
3. Analyze why you chose this artifact and how it demonstrates competence or knowledge of particular standards.
4. Appraise the artifact by examining and interpreting the "impact and appropriateness" of actions and how they relate to professional knowledge.
5. Transfer your practice by describing how the artifact can promote future growth. (Kilbane & Milman, p.64).

### Steps for selecting artifacts

An artifact is "tangible evidence that indicates the attainment of knowledge and skills and the ability to apply understanding to complex tasks" (Campbell, et. al. 2000, p.147). Résumés, educational philosophy statements, goals, mission statements, reflective statements, research papers, case studies, professional development plans, etc. are what people usually include (Kilbane & Milman, 2003, p.55).

Selecting artifacts is challenging because it involves many decisions regarding what kinds of resources to include.

Although producing an electronic portfolio makes it possible to include more documents without increasing the physical size, the creators should remind themselves of the argument for quality versus quantity when selecting artifacts for portfolios. Following are the guidelines to consider when selecting artifacts and items for inclusion in the portfolio:

- Examine as many artifacts as possible.
- Question what you have chosen as the foundation of your portfolio by asking yourself the following questions about each artifact: a) Does this artifact meet the criteria for which I am framing my portfolio?, b) Is this artifact the best example I can use for demonstrating these criteria? and c) Should I include this artifact in my portfolio?
- Create a log sheet of the artifacts you wish to include in the portfolio and relate these to how they meet the standards, or criteria you have chosen as the foundation of your portfolio.
- Be selective.
- Remain focused. Keep your purpose and audience in mind when selecting artifacts ( Kilbane & Milman, p.62).

## Evaluating the portfolio

Barrett (2000) identifies a rubric for portfolio evaluation consisting of five criteria. These criteria include degree of meta-cognition and reflection, ease of navigation, user choice in navigation, seamless integration of standards, artifacts and reflections, appropriate use of multimedia, and specific evaluation criteria based upon the evaluators' standards.

In part two of this paper we will:

1. describe our classroom/student experiences with the development of electronic portfolios;

2. discuss our research findings regarding utilizing the ADDIE Instructional design model in the development process;
3. offer suggestions for teaching electronic portfolio development courses.

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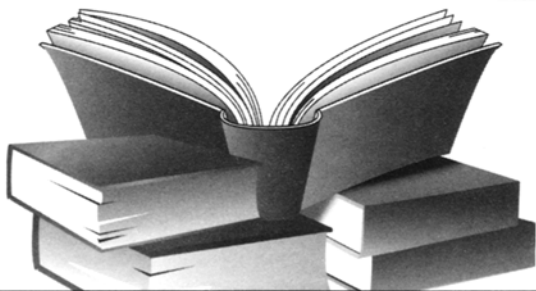
*Peilin Liu, Kay Lowell, Laurie MacDonald and Howard Tsai are Educational Technology doctoral students at the University of Northern Colorado.*

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