

## **WADING INTO THE TECHNOLOGY POOL: LEARNING E-PORTFOLIOS IN HIGHER EDUCATION**

Lori L. Hager  
University of Oregon  
United States of America

### **Abstract**

E-portfolios are embracing the emergence of Web 2.0/3.0 tools, and a vibrant open source community, in support of student-centered learning and assessment. With a focus on the development of 21st century learning and workplace preparation, faculty and students utilize e-portfolios to create dynamic mediated learning environments that transect the borders between classroom learning and professional growth. This paper will present findings and lessons learned from implementing an e-portfolio project at one American university and discuss implications and challenges for embedding Web 2.0/3.0 instructional pedagogies in support of 21<sup>st</sup> century learning.

### **Introduction to the Study**

Daniel Pink (2006) asserted that the next generation of thinkers and leaders will be driven by creators, pattern recognizers, meaning makers, artists, designers, storytellers, and big picture thinkers. With the emergence of Web 2.0/3.0 tools and a vibrant open source community, *learning e-portfolios*<sup>1</sup> are embracing instructional technologies that employ lifelong digital communication tools in support of 21<sup>st</sup> century learning and workforce preparation. Learning e-portfolios place the student at the center of this learning process, providing a mechanism for faculty and students to act as co-participants in learning, and embedding critical 21<sup>st</sup> century skills in an iterative cycle that is at the core of higher order thinking and learning.

### **e-Portfolios in Higher Education**

The last seven years have seen a proliferation in the use of e-portfolios at institutions of higher education. In the United States, 40% of campuses are now utilizing e-portfolios (Rhodes, 2011). Research suggests that participation in e-portfolio learning in a Web 2.0/3.0 environment enhances student engagement, critical reflection and analysis, and fosters a collaborative teaching-learning environment (Cambridge, 2010; Cambridge et al., 2009; Rhodes, 2011; Light et al., 2011).

From university system-wide implementation to individually owned sites built from publicly available web tools, e-portfolios are changing learning and assessment processes and structures in educational institutions. Flexible online learning environments are rapidly changing e-portfolio options from packaged

platforms to grassroots platforms customized from WordPress, wikis, Google, and others.

Universities and colleges employ e-portfolios for a variety of purposes, including supporting students in professional and career advancements (professional portfolios), for student-centered assessment and reflection (academic portfolios that represent a student's "body of work,") and for the purpose of institutional accreditation (provides a means to archive and represent student achievement across schools). Types of e-portfolios typically include:

Portfolios for personal representation guide users in managing their virtual identities via online resumes, professional portfolios, and freeform portfolios. Portfolios for teaching and learning establish workflows that guide students in reflecting upon and sharing learning within and across disciplines. Portfolios for assessment and accreditation provide systematic reporting of results from courses and programs for institution-wide assessment. (Cambridge et al., 2008, p. 492)

Universities that employ e-portfolios, integrate them into coursework and student learning. Students document and legitimize their learning choices through a record in their e-portfolios. At the University of Minnesota (Batson, 2002), for instance, they are using e-portfolios for:

- Creating a system of tracking student work over time, in a single course, with students and faculty reflecting on it.
- Aggregating many students' work in a particular course to see how the students as a whole are progressing toward learning goals.
- Assessing many courses in similar ways that are all part of one major and thus, by extension, assessing the entire program of study.
- Encourage continuity of student work from semester to semester in linked courses.

Learning e-portfolios provide a unique learning environment, which fosters "knowledge transfer" from classroom to workplace (Cambridge et al. 2009; Light et al., 2011). Students develop critical 21<sup>st</sup> century skills and learn to document and provide evidence for the development of proficiencies in their learning and career pathways. This process of "making learning visible," and the selection process in providing evidence for this learning, creates a unique learning opportunity for students, and fosters self-efficacy in how students navigate their own learning process; e-Portfolios serve as a compass to assist students to navigate their educational and career objectives.

### **e-Portfolio Project Description**

The University of Oregon is part of a larger network of schools engaged in developing e-portfolio learning processes, and a member of the fifth cohort of the Inter/National Coalition of Electronic Portfolio Research (I/NCEPR). An interdisciplinary learning e-portfolio initiative was initiated by faculty in three

professional programs (Architecture, Business, and Arts and Administration) who decided to *wade into the technology pool* to see what could be learned about e-portfolios in higher education. This paper focuses on emergent findings of e-portfolio development in one graduate program, and considers implications for broader applications of e-portfolios across 21<sup>st</sup> century learning.

In the Arts and Administration Program<sup>2</sup>, e-portfolios began in 2005 as a faculty initiative to connect coursework and learning objectives in two core components of the graduate curriculum: the professional development course sequence and information technology courses. Students developed showcase e-portfolios, which highlighted how they were applying theory to practice in the development of skills essential for their career pathways, and that also provided them with a “digital resume” which they could use for professional advancement. In 2008, an interdisciplinary e-portfolio initiative between professional programs across campus resulted in a research-based pilot project to implement learning e-portfolios in a blogging environment at the university. This research was contextualized across higher education institutions in the United States as a member of the fifth cohort of the Inter/National Coalition of Electronic Portfolio Research (Bramhall et al., 2011).

For the Arts and Administration graduate program the initiative resulted in an implementation of learning e-portfolios as a requirement across the graduate curriculum. Graduate students are required to create and maintain learning e-portfolios in the WordPress, platform throughout their program of study. Students create learning e-portfolios in the open source blog-based platform, and also create showcase e-portfolios using a standard web development program. The showcase e-portfolio is designed to be their capstone portfolio, where they designate the evidence for professional competencies matched with career objectives, which they may share with potential supervisors and employers. The learning e-portfolio is designed to be their “compass through learning,” one that changes with the student as they progress through their degree program. Students have the option of “taking” it with them when they graduate, so that learning e-portfolios have the capacity to be lifelong and life wide (Barrett, 2011; Rhodes, 2011; Cambridge, 2010).

On their learning e-portfolios, students post their learning objectives and two-year academic plan, and, for each class, they post learning objectives that connect the course to their larger academic and career goals. Periodically throughout the term, and at the end of the term, students post artifacts and reflections that provide a narrative and evidence for their learning and how it connects with their overall objectives. During their summer professional internship placements, students create “field blogs” that connect to their learning e-portfolios, allowing them to demonstrate how they are connecting theory to practice, how their thinking is changing, and how their research is connected. In an e-portfolio system in a blogging environment, students also have the option to aggregate multiple web 2.0/3.0 tools that enhance their learning experience, and, if they choose, to maintain an active blog through posting assignments, reflections, and professional

development and research activities. These learning e-portfolios assist students to build a body of evidence for the development of critical 21<sup>st</sup> century skills (Hager, 2012).

The vision of the AAD e-portfolio system is a comprehensive learning system that serves as a hub for the generation of dynamic learning communities between faculty, students and professionals. It centers the integration of demonstrations of excellence in academic objectives, participatory learning and professional development through digital communication.

The e-portfolio project includes instructional blogs, project blogs, and an aggregated hub that provides a point of entry to program-level information, course information, faculty and student information, tutorials and e-portfolio guidance, and a program-level blog. Through aggregating learning e-portfolios, program resource blogs, instructional blogs, faculty and student professional portfolios in a hub, or “digital commons,” a community of practice is generated that supports multi-modal learning and applications.

### **Emergent Findings**

An analysis of surveys, questionnaires, and student e-portfolios indicate that e-portfolio learning in the WordPress, (blog) platform supports unique student learning. Peer to peer engagement increases; student ability to demonstrate and articulate growth over time improves. In addition, curricular and co-curricular learning connections are made visible that have implications for the applications of theory to professional practice and professional development; skills learned in the e-portfolio environment are transferable; and the level of critical reflection increases as a result of the unique digital environment.

Students self-reported the value of participating in e-portfolio learning in an open blogging platform: sharing and viewing each other’s work led to increased student-centered learning. Aggregating and archiving their own work led to greater self-reporting of growth over time; and the unique value of the public and visible nature of system provided unique opportunities for peer-to-peer learning and self-efficacy.

### **Research Methods**

Data collected focused on factors in student, faculty, and institutional engagement. Factors in student engagement in learning e-portfolios, instructional blogs, and the aggregating hub, were tracked over a two-year period. Pre- and post- surveys were administered to students, focusing on self-reporting of preparedness to engage in e-portfolio learning, challenges, and perceptions of value. Pre-surveys were administered to students prior to participation in the e-portfolios, which assessed preparation to engage with emergent technologies, perceptions of the value of emergent technologies in learning and the workplace, and value of e-portfolios. Post-surveys assessed student self-reports of how they were engaging with e-portfolios, perception of value and application, and challenges. Surveys were administered twice a year for two years to the entering

cohort of graduate students. Other information was collected through publicly available blog posts, reviews of public e-portfolios, and periodic focus groups. Data on faculty engagement was collected from faculty self-reports and focus groups in three participating academic units, and from publicly available instructional blogs.

### **Student Usage**

Students use their e-portfolios in vastly different ways, which the system and the project allow and encourage, depending on their career and degree emphasis. End of year surveys, which examined factors in engagement and usage of the learning e-portfolios, found that students self-reported value for a multitude of uses: aggregating all their academic work, posting course assignments, information sharing, and keeping track of resources. Students create research blogs where they aggregate resources, reflect and synthesize courses and research, and make multi-disciplinary connections between courses explicit, while connecting their co-curricular project-based learning.

Students reported that it was valuable to be able to aggregate and view their work over time. They used learning e-portfolios to aggregate all their academic work and course assignments, for information sharing and keeping track of resources, and as a simple and accessible hub for collecting work and sharing it with colleagues. One student reported, "Having a centralized place for all of my work and thoughts (learning goals/reflections) has helped me track my overall learning and draw conclusions/see themes over the quarters." Students remarked "It keeps all of my most important school work in one place, and it is something to show to potential employers," and, "it is simple and provides an accessible hub for collecting work and sharing it with my colleagues in school."

Students apply what they are learning from utilizing their learning e-portfolios in the WordPress environment in creating project blogs to demonstrate co-curricular work, using their e-portfolios to collaborate and represent projects in class, to keep up field journals when they are away on their internships, to post reflections and keep in touch with what each is doing and experiencing. Students report that they value engagement in learning e-portfolios also for its importance as a marketing tool and for personal branding, personal expression, information collection, communication and distribution of work, and for job advancement.

Some students focus on the extension of their professional networks, utilizing the blog feature to publish their work in the public domain. As a result, several students have been invited to be professional and guest bloggers with international associations and organizations. Said one student, "I blog for other organizations already, and the entries can serve as writing samples for potential jobs. I use a variety of social media for research and making professional connections."

Students indicated a broad range of discomfort to comfort with negotiating their public digital identities, and the educational use of what they associate with

informal, and social networking tools. Students who rated their comfort with social media highly in pre-surveys, rated themselves lower when engaging with similar Web 2.0 technologies in formal learning contexts in post-surveys. Students demonstrated discomfort when asked to transfer skills and tools employed in informal learning to formal learning contexts--these are domains that they have traditionally kept separate, and this affects how they assert their digital selves and identities in different contexts. Yet, these challenges have provided a critical opportunity to engage students in discussions around managing their digital identities and digital citizenship, which has implications for a broad array of professional practices.

Students value their ability to articulate and demonstrate growth over time. Students report that their learning has changed as a result of their use of learning e-portfolios. For example students reported that:

- “I am forced to look back on my work and reflect on how it informed my understanding of the course topics. I am also more organized in my documentation of work.”
- “Classes that utilize the e-portfolio typically ask for pre- and post-reflections on the class, so it helps to identify how I learn and grow throughout the course.”

### **Active Learning**

Students apply learning across their courses and course content, making use of tools and approaches learned in one class to apply to solving challenges and posing solutions in other courses. For example, a digital storytelling project in one class becomes a means to demonstrate learning in another course. Students post comments, reflections, and other materials into a common instructional hub, which allows students to peer review each other's work, and to post critiques and observations.

Faculty report that through embedding e-portfolios in graduate student learning, the quality and sophistication of student reflections and analyses have increased, and student engagement has become more robust and self-directed. Feeling part of a learning community, students are helping to guide its growth and development.

Light et al. (2011) report that these are instrumental processes that are reflected in e-portfolio learning in the concept of “folio thinking:”

Central to folio thinking and e-portfolios is the process of reflecting on the growth of one's knowledge and capabilities over time with an emphasis on meta-cognition by intentionally providing structured time and space for learners to consider and document the process of their learning and not just the product (assignments, tests, and so on). This process highlights the affordances of e-portfolios as not only potentially transformational with

respect to individual learning and development (Kindle Locations 463-467).

Faculty acknowledge that the intentionality of stating overall learning objectives, matching these with each course, then reflecting on what contributed to meeting these objectives, has fostered more engaged learners. By personalizing their learning journey, students actively meet and match the learning requirements and outcomes in the courses, rather than passively waiting to be taught.

Faculty can designate that the instructional blog be viewable by just the students in the course, by all users in the system, or completely publicly available. A rigorous privacy policy has been developed, in adherence to university requirements. Students and faculty maintain the greatest degree of control over visibility. So, the choice of what to make visible, or private, becomes an intentional choice with implications that become opportunities for discussion and analysis.

The ways that participating faculty utilize the system is highly variable and adaptable to unique pedagogies. Faculty may aggregate all their courses and instructional materials on a single instructional blog, or create a different one for each class. Faculty may include in their instructional blogs any external resources, such as websites and web resources, Diigo groups, and other kinds of Web 3.0 tools – modeling the application of learning tools and strategies. Students are contributors on instructional blogs where they post reflections, contribute to developing course resources, and become co-contributors in the development of course content and resources. Students engage in robust online forums, which are then continued into the classroom and into their team-based projects.

### Discussion

The ways in which both students and faculty engage in learning and in technology are widely varied. While higher education institutions are put on notice to prepare for students fully conversant in Web 2.0/3.0 and social media, the levels at which students are entering the university prepared are hugely varied, and comfort in engaging with new technologies and subsequent changes in pedagogical structures affects the time and effort that faculty give.

Integrating learning e-portfolios into the curriculum creates a need for visible curriculum mapping, making graduate learning outcomes visible, and an articulation of pedagogical practices. As Cambridge et al. (2008) asserts, “Integrative learning is supported by offering students broad latitude in composing their portfolios, while assessment requires gathering data that can be compared across programs and institutions. It is difficult to serve both these purposes at once” (p. 500). Helen Barrett (2009) discusses this as an *opportunity cost* of e-portfolios, for faculty and students. Not all faculty members perceive the benefits of participation, viewing the risks as greater than the benefits. The learning curve for faculty participation in e-portfolios can be steep, and unless the

institution supports participation through incentives or rewards, then faculty engagement can be a challenge.

As Coogan (2009) points out, blended learning at the graduate level comes with its own set of issues and challenges. The convergence of formal and informal learning processes through social networking tools, and blended learning environments, raises unique challenges. Students demonstrate a degree of discomfort when asked to transfer skills and tools employed in informal learning to formal learning contexts - these are domains that they have traditionally kept separate, and this affects how they assert their digital selves and identities in different contexts. Yet “digital citizenship” is becoming an increasingly important part of education and workplace preparation.

Research has suggested that participation in learning e-portfolios can lead to changes in learning and pedagogy (Cambridge, et al. 2009; Jafari & Kaufman, 2006). One of the factors is how faculty are engaging with it in their courses; another factor is the general climate for managing risk and innovation in the institution. Both faculty and students acknowledged that utilizing it for innovation and change was high risk – from the publicly visible profile of the project and the implications for their academic, professional identity; and for faculty who experiment with varying degrees of success.

### **Challenges - Lessons Learned**

Though the increase in new media academic programs and wide spread application of Web 2.0 technologies are changing how the academy views digital products in promotion and tenure, this was a considerable issue in faculty participation. Participation of pre-tenured faculty in new media projects that have a high learning curve and that foster innovation, and therefore are high risk, is extremely challenging due to the lack of existing mechanisms for recognizing and rewarding these accomplishments. At the same time, it is apparent that e-portfolios are driving pedagogical change and have the potential to make a direct and critical contribution to the advancement of the arts management field.

Though participating faculty across campus recognized the value of fostering an environment for cross-curricular learning to occur, identifying common curricular goals was a challenge. At the same time, current emphasis on 21<sup>st</sup> century skills development and the role of education in developing the 21<sup>st</sup> creative workforce provided a foundation for articulating meta-cognitive learning such as communication, creativity, imagination, and collaboration, which are particularly suited to the cross-curricular e-portfolio environment.

As a faculty-driven e-portfolio initiative, the project has both benefits and challenges in terms of engagement and sustainability. Many higher education e-portfolios are housed in administrative teaching and learning hubs. This is largely a result of how and why e-portfolios are used institutionally. Institutional e-portfolios require a mechanism for implementation, support, and training. Those e-portfolio systems driven through a teaching and learning center may have

difficulty getting faculty and students involved when e-portfolios are not required, or viewed as instrumental to education goals, and may have a large learning curve for faculty and students. Department or faculty-driven e-portfolios may arise from faculty and student needs and goals, but struggle with sustaining such a system or program through lack of resources and support infrastructures.

### Summary

The goal of the e-portfolio initiative is to foster the development of a comprehensive learning environment that serves as a hub for the generation of new knowledge in a dynamic learning community of faculty, students, and professionals and that centers the integration of demonstrations of excellence in academic objectives, participatory learning experiences, and professional development.

The arts have long employed portfolios as demonstrations of learning and accomplishment, and these, as both product and process, have been the result of a creative, reflective, and iterative process that is at center of both arts and non-arts learning and practices. Howard Gardner's *Five Minds of the Future* (2009) and theories of multiple intelligences (1983) suggest a framework for utilizing e-portfolios for "differentiated assessment" (Stefanakis, 2011), and arts-based authentic assessment strategies may support a range of representing multi-modal learning in the e-portfolio learning environment.

That the e-portfolio project has had an impact on pedagogy and the learning culture of the department is clear. That changes in learning and engagement will take place in the context of a digital revolution is uncontested: e-Portfolios are assisting the development of our digital neighborhood, our point of daily departure and return, where community is formed, identities constructed, and connections between the academy and the world are enriched and extended.

### Notes

1. Learning e-portfolios refer to formative electronic portfolios, which serve as containers for student work, evidence of achievement, and which document processes and applications of learning through mediated formats. Though many packaged e-portfolio systems that incorporate social media applications are now commercially available, this project utilized an open-source blogging platform with integrated Web 2.0/3.0 tools.
2. The mission of the Arts and Administration Program is to "educate cultural sector leaders and participants to make a difference in communities" (<http://aad.uoregon.edu/about/>). The Arts and Administration Program is composed of four full-time faculty with expertise in cultural resource management, and admits approximately 25 graduate students each year into the Masters program, with an ongoing enrollment of approximately 80 graduate students at any year. An undergraduate minor admits approximately 15 students each year.

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