The Bottomless File Box:
Electronic Portfolios for Learning and Evaluation Purposes

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Portfolios have been used for the past three decades in higher education for assessment of student competency and also as a reflection tool to assist student learning. Electronic portfolios, or ePortfolios, have additional benefits compared to paper portfolios in that they are easily accessible, portable, and sharable, and they are more environmentally friendly. Although ePortfolios are gaining in popularity, faculty and students sometimes resist adopting new technology. We describe the development, implementation, and evaluation of two ePortfolios, for undergraduate and graduate programs, in a Human Development department. The systems were created in response to a university initiative for integrated assessment of student competencies, the findings of which are reported through a centralized, electronic system. For undergraduates, the ePortfolio was used primarily as an evaluation and reflection tool, whereas graduate students created personal ePortfolio pages to demonstrate learning and professional development. As a result of our experience, we recommend that departments seeking to implement ePorfolios as part of an integrated assessment system start simple, collaborate with technology experts, build upon work completed in other programs, and educate students and faculty about the personal and professional benefits of ePortfolios.

University instructors and administrators are challenged to provide evidence of student learning. Grades and test scores provide insufficient evidence (Chambers & Wickersham, 2007); therefore, administrators and faculty seek indicators of the process and outcomes of instruction, such as the degree to which specific learning goals are demonstrated in student work. Consequently, assessments of student learning should demonstrate the degree to which student outcomes reflect program goals (Cambridge, 2008). Some universities and individual departments have moved towards integrated assessment to gather evidence of student competence on a routine basis as opposed to great flurries of activity commonly associated with periodic program evaluations (Chambers & Wickersham, 2007). While integrated assessment makes routine the process of gathering and evaluating indicators of student learning, there are difficulties associated with completing integrated assessments (Swigonski, Ward, Mama, Rodgers, & Belicose, 2006). Electronic portfolios represent one means to simplify the process of integrated assessment of student learning.

Electronic portfolios, or ePortfolios, are "personalized, web-based collections of work, responses to work, and reflections that are used to demonstrate key skills and accomplishments for a variety of contexts and time periods" (Lorenzo & Ittelson, 2005, p. 3). Electronic portfolios should support evaluation efforts and student learning the same as a more traditional portfolio process with a few advantages over the traditional portfolio. ePortfolios enable streamlined management of materials and ease of distribution for evaluation and providing feedback (Cooper & Love, 2002; Gathercoal, Bryde, Mahler,

Love, & McKean, 2002, p. 29). Millennial students find the technical aspects (e.g., portability) and appearance of the ePortfolio appealing (Ciocco & Holtzman, 2008). Finally, these portfolios boast the ecological benefit of saving space, paper, ink, and other materials associated with the traditional portfolio. Considering these benefits of ePortfolios, we sought to develop an ePortfolio system that could be incorporated into an integrated assessment system that evaluates student learning and professional competencies. In the current paper we discuss how we developed and implemented an ePortfolio system in order to use available technology to respond to the university demand for integrated assessment documenting student learning and competencies.

Portfolios have been used across multiple disciplines for decades to achieve three primary objectives: to support student development and learning, to support assessment of student learning, and for marketing (Wolf, 1999). Chambers and Wickersham (2007) stated that there has been a conflict between two of these objectives, which they name as "assessment *of* learning" and "assessment *for* learning" (p. 352). They argued that portfolio objectives needed to be integrated into instruction and evaluation efforts to maximize benefits for students, teachers, and administrators. This means that the best portfolios are used both for assessment purposes and to support student learning.

Developmentally, portfolios support student learning; the students identify their learning goals, reflect on the processes they employed, and assess their success in achieving the specified goals. The reflection process is learner-centered (Hewett, 2004) and should engage students in critical thinking (Donovan & Iovino, 1997) as they assume increasing responsibility for aligning their learning process with identified goals.

Education programs employ portfolios widely to document students' achievement of accrediting standards for teachers (e.g., Strudler & Wetzel, 2008; Swan, 2009). Other academic programs whose curricula are informed by accrediting bodies use student portfolios for evaluation and reaccreditation purposes (e.g., in nutrition and food sciences, see Clark et al., 2009; for engineering, see Knott et al., 2004). Portfolios provide an effective vehicle for organizing and presenting materials for evaluation and tracking students' academic progress (Swigonski et al., 2006).

Portfolios have historically been used by fine arts students and professors to present their creative work as part of the application process for competitions and employment. Artists and performers led the way with multi-media portfolios (Meeus, Questier, & Erks, 2006), which allowed them to share their visual and auditory talents in a compact format. Using portfolios to share work thus meets the third goal of portfolios, marketing.

Literature Review

Limited research on ePortfolios' utility and impact on student learning is mixed. Gathercoal and colleagues (2002) found that program faculty were the lynchpin to the success of ePortfolios; without their active support, students' full participation could not be expected. Chambers and Wickersham (2007) described several surprising results in their survey of students and instructors in a master's of education program. Students reported challenges using basic computer skills required for the ePortfolio; not surprisingly then, students reported gains in technical skills and confidence using ePortfolio technology. Despite building technical skills and self-knowledge, students were not confident that the ePortfolio facilitated their content learning. The authors concluded that the students, who were the first cohort in the program to utilize the ePortfolio, viewed the process as external to their learning and program requirements. However, they perceived that having an ePortfolio would be helpful for professional development. The authors concluded that targeted efforts by instructors with subsequent cohorts should address this perception by emphasizing the connections between the ePortfolio and student learning.

Benefits of enhanced technical skills and employability stemming from management of ePortfolios are a theme in research of students' experiences. Sherry and Bartlett (2004-2005) found that students had an overall positive view of ePortfolios. Undergraduate (n=23) and graduate (n=14) education students reported that ePortfolios improved

their technology skills, would help them get jobs in the future, were good for showcasing skills and learning, promoted self-evaluation, and were more powerful and convenient than traditional portfolios. These results were true of students with different levels of technology skills and training. As Chambers and Wickersham (2007) found, this group of students also possessed a limited view of how ePortfolios could be implemented within broader organizational structures, such as use by students in their future classrooms or by school teachers and administrators to assess students, programs, or instructors (Sherry & Bartlett, 2004-2005).

ePortfolios are a way for graduate students to develop their professional and self identities (Blair & Monske, 2009). For example, with a qualitative study of 22 ePortfolios created by graduate students, Brandes and Boskic (2008) found that two of the themes that emerged were that of ePortfolio creation as a journey and as a transformation. Both of these themes emphasized how the process of developing an ePortfolio included personal exploration and reflection in a new on-line format, which guided their learning about themselves, technology, and their field. Tsai, Lowell, Liu, MacDonald, and Lohr (2004) in a qualitative study of five doctoral students discovered similar themes. They found that the iterative process of developing ePortfolios, including reselecting artifacts and redesigning elements, helped to promote students' learning of course material and self-discovery. However, student reports varied on how positively they viewed this process; self-reflection confirmed one student's confidence, and left another feeling depressed. This suggests that portfolio development can increase introspection, and thus should be guided closely to help students to feel competent and pleased with their finished products, instead of defeated or frustrated (Ciocco & Holtzman, 2008).

The current paper describes the development of an ePortfolio for the department of Human Development at Virginia Tech. We describe the circumstances by which we were motivated to develop an integrated system for evaluating student learning outcomes using the ePortfolio. We discuss the collaborative effort to identify appropriate learning outcomes, design the ePortfolio, create tools for students to post ePortfolio items, and assess student learning. The undergraduate ePortfolio was developed first, followed by an ePortfolio for doctoral students that included an optional personal ePortfolio and standardized department ePortfolio required of all students. Challenges in building faculty and student buy-in and implementing ePortfolio technology are addressed, and we conclude with recommendations for other programs and next steps in the department's continued development and utilization of the ePortfolio system.

ePortfolio Development

Motivation

Academic departments at Virginia Tech conduct 5-year program reviews, which include close scrutiny of undergraduate and graduate student learning. Faculty involved with the evaluation process have experienced frustration gathering evidence of student learning from various course assignments. Evaluators typically find themselves coordinating the collection of paper copies of written assignments from several instructors across multiple semesters, which involves randomly sampling assignments from a class, removing identifying information, making paper copies, and returning them quickly to the instructor for grading. Evaluators of these artifacts are then responsible for interpreting instructors' directions for the assignments as they assess students' success demonstrating the targeted outcome. Our department completed its last 5-year review in spring 2006 having identified some strengths and growth areas in the department and feeling anew the challenges of coordinating materials for the evaluation. The department also launched a revised undergraduate curriculum in fall 2006, which meant that a number of new and revised courses were implemented with useful information gleaned from the 5-year evaluation data.

In 2006, the university adopted an integrated assessment system (to compliment the 5-year review) that involved annual evaluation of some element of each academic undergraduate and graduate program and reporting of evaluation goals and outcomes through a central reporting system. The prospect of repeating the 5-year frenzy on an annual basis motivated us to find a system with which we could efficiently gather and assess meaningful information on student outcomes with minimal disruption to instructors and students. That same year, the university revised its guidelines for undergraduate student demonstration of visual, written, and spoken communication skills. Every undergraduate program aligned courses and assignments from the freshmen to senior level with these different means of communicating.

Additional motivation for a graduate ePortfolio stemmed from the Graduate School requirement that each department provide annual evaluative data on graduate students' progress towards degree (some of which is distinct from the indicators of student learning expected for the university's annual assessment and 5-year academic program review). We sought a system for meeting graduate school expectations that would also support faculty efforts to address concerns and champion the successes of our students. The first Human Development Graduate Student Annual Review (GSAR) was held in 2007 using a standard paper portfolio format.

With the convergence of these five events (5-year review, initiation of a new undergraduate curriculum, introduction of integrated annual assessment, revised communication skill standards, and Graduate School reporting requirements), all indicators pointed to change in the department's undergraduate and graduate evaluation system. By identifying gaps in our curriculum and identifying where (in which classes) and how (with which assignments) these learning competencies were addressed, we were able to focus our efforts on enhancing competencies and assessing resultant student learning. We possessed all the impetus necessary to create a more efficient system for gathering indicators of undergraduate student learning. Undergraduate and graduate ePortfolios would provide our department with an easily accessible, integrated evaluation system that could be utilized for multiple and varied university assessment requirements while also facilitating student self-assessment and professional development.

Consultation

We piloted a departmental ePortfolio to address dual objectives of enhancing student learning and integrating assessment of student competencies and progress towards degree with a technologically advanced, portable tool that is more environmentally friendly than traditional paper portfolios. The department's ePortfolio system is powered by Sakai's Scholar program (http://sakaiproject.org), a new open-source software program for course management and interactive web-based communication. The university also uses it exclusively for online course management. The benefit of using Sakai for our ePortfolios is that it is customizable for the needs of our department (i.e. our student portfolios do not need to follow the same template as students in English or engineering). As other departments began to use Sakai to develop ePortfolios for their students, we were able to base our ePortfolio on their models and make changes to fit our needs. We relied heavily on the expertise of others to develop our own ePortfolio model.

Undergraduate ePortfolio. We developed our undergraduate ePortfolio through interdisciplinary collaboration with staff from the offices of academic assessment, undergraduate teaching, and learning technologies. Faculty were surveyed to identify assignments completed in Human Development courses that aligned with (a) core disciplinary competencies (i.e., program development and evaluation skills) and (b) university competencies for written, spoken, and visual communication (see http://www.cle.prov.vt.edu/views/index.html). Our original ePortfolio template was intricate (see Figure 1), requiring seven artifacts from a senior capstone course intended to reflect five

Figure 1
Proposed Matrix for HD Senior Captstone ePortfolio 2006-2007

Competency	Assignment						
	Program Analysis	Leadership Case Study	Leadership Exercises	Evaluation Design	Presentation	Other coursework	Other coursework
Knowledge of principles of lifespan development and family relationships							
Knowledge of human services systems and organizations and understanding of their functions and operations	*						
Understanding of systems of oppression and opportunity							
Critical thinking and analysis skills		*					
Sensitivity to and ability to reflect deeply on intersections of public and private experience			*				
Helping skills for professionals in human services and related fields							
Program development and evaluation skills				*			
Speaking, writing, and visual communication skills, including computer literacy					*		
Applied research skills and ability to evaluate print, video, and Internet resources							

Figure 1. Grey items with asterisks (*) reflect alignment of student competencies with assignments collected for the HD senior capstone course.

competencies central to the Human Development degree and two categories of communication competencies. Besides being complex and placing the onus for gathering ePortfolio materials on one course instructor, the initial matrix contradicted pedagogy about using ePortfolios to document an individual's development. Gathering virtually all of the material in a student's capstone course could only indicate competencies near the time of graduation without indicating development across the student's years in the program.

Working with support from the university office devoted to undergraduate teaching (www.cider.vt.edu), we analyzed the department's last 5-year review, our revised curriculum [developed to meet the National Council on Family Relations Certified Family Life Educator (CFLE) requirements], and the department's alignment of courses with university communication requirements. In so doing, we identified two key learning areas to target with the ePortfolio. These core Human Development and communication competencies, *professional writing* and *program evaluation*, were identified as weaknesses in our last 5-year review and are at the heart of many human service professionals' roles. Using faculty survey responses, we identified course assignments, or *artifacts*, that targeted this content competency (program evaluation) and communication competency (professional writing). The resultant undergraduate ePortfolio consisted of three

Table 1
Current HD Undergraduate ePortfolio Aligning Courses with Content and Communication Competencies and
Artifact Assessed for Competency Demonstratio

	HD 2335: Principles of Human Services	HD 3014: HD Research Methods	HD 4714: HD Capstone
Professional Writing Program Development and Evaluation	Case study	Needs assessment	Grant proposal

Figure 2
Current Graduate Student Department ePortfolio

assignments (see Table 1), one each from three classes taken by majors at the sophomore, junior, and senior levels that exercised these competencies, thereby giving us access to evidence of students' development of these core competencies as they progress towards their degree.

The current ePortfolio captures students' artifacts and their reflections on the assignments, a self-evaluation of their success demonstrating learning objectives. The learning technologies experts (www.lt.vt.edu) taught us the technological skills necessary to implement this department-wide system, collecting artifacts from the three identified classes every semester. Hence, through conversations and collaborations with experts on instruction, evaluation (www.aap.vt.edu) and Sakai, we developed an undergraduate ePortfolio that was manageable and met our immediate needs for integrated assessment.

Graduate ePortfolio. We developed the graduate ePortfolio to document progress towards degree with an emphasis on professional competencies. In order to support student learning, assessment, and marketing, we created two templates for the graduate student

ePortfolio. First, to meet Graduate School requirements, we used a standard department ePortfolio template to support the GSAR process, which is intended to reflect the student's progress in the program during the annual reporting period. Initially, students submitted materials for the GSAR in paper form, including their (1) transcript, (2) CV, (3) student evaluation completed by the student and his or her advisor, (4) assistantship evaluations, (5) a checklist indicating steps in the degree progress that the student has completed (with associated dates), and (6) copies of professional presentations and published papers. Items submitted to the department ePortfolio for the GSAR process were identical, so the move to electronic submission represented only a procedural change.

We created the second graduate student ePortfolio template, a professional ePortfolio page, when we received feedback from current graduate students that a professional ePortfolio (similar to a personal website) would be a valuable tool for students searching for internships and employment. Students with a personalized ePortfolio are able to market themselves and their skills in more easily accessible, and often

faster and richer, ways than students with traditional portfolios or no portfolio at all. This ePortfolio includes an opening page with the student's photo and various tabs that include artifacts documenting a student's research, service, and teaching experience; it provides links to publications, presentations, and the student's CV (see Figure 2; Students can post items once to the site and designate which appear in their professional ePortfolio or departmental page.). After creating the professional ePortfolio page, the creator can keep the site private, share it with specific individuals (e.g. a professor or potential employer), or publish the site publically on the Internet. Because it is increasingly common for potential employers and clients to complete Internet searches on applicants, a professional ePortfolio page was intended to allow students to showcase their skills in a professional manner. Thus, through a search, or a web address given on a business card or CV, those interested can easily access carefully selected information and artifacts about the student.

Implementation

To implement the undergraduate and graduate ePortfolios, the second author, a graduate student assistant, was trained in Sakai and the ePortfolio technology; she then developed training workshops, including Camtasia videos, to support faculty and students as students developed their ePortfolios. Undergraduate students received a brief orientation in each class that required an artifact for the ePortfolio. The graduate assistant addressed the dual benefits of the ePortfolio system (supporting the student learning process by engaging the students in reflection and documenting student learning by archiving student artifacts), but most of the workshop time was devoted to using the Sakai program, which was new to faculty and students alike. As the year progressed and more students became familiar with using Sakai as a course tool (many faculty used Sakai's Scholar courseware in their courses), the ePortfolio process was mastered more quickly, taking less than ten minutes to explain.

The same graduate assistant introduced the dual page graduate ePortfolio in a professional development seminar attended by all department graduate students. The required department ePortfolio page used for the GSAR utilized a matrix structure similar to the undergraduate ePortfolio page and was easily adopted by the students. The personal page was more complex because of the flexibility students had to customize their page; thus, it proved more technically challenging for students to adopt. To support graduate student development of their personal ePortfolio pages, the graduate assistant provided an initial workshop and created additional Camtasia videos. Students could then access these videos when needed as they developed their ePortfolio. Students who used these videos found them helpful and easy to follow, though the second author experienced many students' preference for individual consultation over Camtasia videos.

Evaluation of Student Artifacts

As the ePortfolio templates developed, the first author worked with the department's Directors of Undergraduate and Graduate Studies on evaluation procedures. The process implemented to evaluate student work has, thus far, evolved distinctly for graduate and undergraduate artifacts.

In consultation with staff at the university office dedicated to undergraduate education, the first author and Director of Undergraduate Studies developed a simple rubric to evaluate undergraduate ePortfolio artifacts. Currently, the rubrics are specific to the artifact being evaluated.

Undergraduate students in our department currently number more than 500, with   50-100 students submitting artifacts for each of the three ePortfolio courses every semester. Given the large number of artifacts submitted each semester, the Director of Undergraduate Studies and a second designated evaluator (a trained graduate student) randomly select 20% of the artifacts from one of the three courses (raters alternate between the three courses) as part of the integrated annual assessment process. After establishing inter-rater reliability using the evaluation rubric, each rater independently scores the students' artifacts using the evaluation rubric and indicating whether the competency was demonstrated. A weakness of our system is that the Director of Undergraduate Studies sometimes rates the work completed by students in one of her courses. The competencies evaluated vary somewhat from year to year, reflecting the integrated assessment process, which requires the Director of Undergraduate Studies to identify and evaluate the accomplishment of a different learning objective annually. Evaluation data are reported through a central university system (WEAVE; www.weaveonline.com); findings are also shared with department faculty and inform undergraduate initiatives, including assessment goals for subsequent years.

We are developing a Metarubric informed by the American Association of Colleges & Universities VALUE Metarubrics (http://www.aacu.org/value/participation.cfm) that can be used across all the artifacts. With a Metarubric, a student artifact demonstrating competence in a 2000-level (sophomore) course would earn a rating of a 2 on a 4-point scale, while a student artifact demonstrating competence in a 4000-level (senior) course would earn a rating of 4 on the same scale. Use of a Metarubric simplifies evaluation by standardizing the evaluation tool across

assignments targeting the same learning outcomes. It allows evaluators not only to assess student learning within a given set of artifacts but also to monitor intraindividual development. A student's individual scores should increase across the different artifacts, reflecting development across their coursework.

Considering the graduate ePortfolios, only the standardized department ePortfolio is evaluated by the department with the GSAR. The personal ePortfolio pages are created and maintained independently by the students. The standardized department ePortfolio is simply used as a means for students to post their GSAR materials and for the department to maintain copies of the ePortfolio artifacts. Students submit their ePortfolio items for their faculty advisor and the Director of Graduate Studies to review prior to the GSAR. At the GSAR meeting, advisors report on graduate student progress towards degree, including accomplishments and concerns. Faculty advisors are responsible for providing written feedback on the GSAR, which is signed by the student and filed with the student's records. The student and his or her graduate committee address concerns with student progress jointly. The Director of Graduate Studies utilizes ePortfolio data for two purposes. First, he or she assesses and reports on achievement of identified goals for the university's integrated assessment program using a centralized reporting system (WEAVE; www.weaveonline.com). WEAVE data are often the source of the next year's goals and related activities in the graduate program. Second, the Director of Graduate Studies prepares summary notes on the GSAR, which are submitted to the Graduate School annually on a CD containing each student's GSAR evaluation materials and the faculty advisor's written feedback.

Reflections and Next Steps

Evaluation of ePortfolio Utility

We launched our undergraduate ePortfolio in 2009 and the graduate ePortfolio in 2010. Evaluative feedback we received about the ePortfolio, including survey responses from doctoral students and solicited feedback from faculty, has been used to revise the process for training students and faculty to use the ePortfolio system. Here, we summarize the perspectives of different users of the system, describe our plans for refining our ePortfolios, and make recommendations for others considering ePortfolios.

Administrator's perspective. As the current department head and the person responsible for leading the department's last 5-year academic review, the first author values the opportunity that ePortfolios create to integrate assessment of student learning in a way that can be meaningful for instructors, streamline the efforts of evaluators, and reduce waste of materials and time. The ePortfolio system, as with any large-scale assessment effort, could not have been developed by one person. We were fortunate to have resources in offices across campus that supported our technical, assessment, and pedagogical needs. The resultant system is simpler, more focused, and reflects student development better than any product one faculty member could have created alone. The investment of department and university resources to hire a graduate student to collaborate with the department head, other faculty, students, and university consultants was worthwhile; the graduate assistant did not start the project with advanced computer skills, but her interest in the project and skill for collaboration and independent work were great assets to the project. Other graduate assistants have since moved handily into the role of tech support for the ePortfolio system.

The ePortfolio functions largely as a giant file box that we can go to at any point to evaluate evidence of student learning; some evaluations will be mandatory, while others may evolve with recognition of strengths or gaps in the curriculum. We also envision opportunities to utilize the ePortfolio to involve alumni and practitioners as evaluators, which will reduce demands placed on faculty while benefiting the department with a real-world perspective on how our curriculum supports student development of skills necessary to succeed in the workforce.

Trainer's perspective. The graduate student assistant (Laura) who developed the ePortfolio training materials and worked with students and faculty to use the undergraduate and graduate ePortfolios, found the Sakai software simple and quick to use. Laura already had a good working knowledge of the program, so applying her knowledge to evaluation took little new learning. She found it helpful that she did not need to go into an office and look through boxes and files to find a student paper, and instead could simply click on a document on her computer, read it, and send the feedback electronically to the main evaluator. This saved travel time, storage space, and headaches in actually finding student papers months after they had been submitted.

Students' perspective. Undergraduate students' comfort with the Sakai program grew each semester, and the second author found that training sessions proceeded more quickly and required fewer follow up questions of the graduate assistant. Based on feedback from the instructors of courses for which ePortfolio artifacts were submitted, we learned, similar to Chambers and Wickersham's (2007) findings, that students viewed the ePortfolio as a valuable means of storing their work but lacked a vision for how the ePortfolio could be useful to them in the future –

whether to demonstrate their skills to a potential employer or to utilize in the workplace.

Turning to the graduate ePortfolio, students had some technical difficulties submitting and securing their GSAR materials into the ePortfolio, but the Director of Graduate Studies and his graduate assistant easily addressed these. Considering the personal ePortfolio pages, while students could see the benefit of having a personal ePortfolio, they felt that the time needed to master the technology and develop a professional product was too great. In this regard, our findings reflect those of Ciocco and Holtzman (2008) who found that millennial students did not adopt ePortfolio technology intuitively. Only one student of 18 who received training did not complete the personal ePortfolio page; however, final products varied in detail and professional appearance.

Faculty members' perspective. Faculty involved with the undergraduate ePortfolios faced the greatest challenges as they worked with large numbers of students to learn the steps for posting artifacts. Two evaluators used the ePortfolio to access artifacts for evaluation. Because the technology was new to the faculty as well as the students, some concerns were voiced about the time needed to navigate the system. At the same time, evaluators were able to access the artifacts for evaluation through the centralized system, without having to collect and make copies of student work.

Next Steps

We have generated a list of next steps to take in our own department of Human Development. These steps may also guide other programs developing ePortfolio systems to support student learning and integrated assessment.

As other ePortfolio scholars determined (Gathercoal et al., 2002), we found that faculty support for the integrated assessment system was critical to its success. We began strategically with the faculty responsible for annual evaluation efforts; with the undergraduate ePortfolio, it was also helpful to start with faculty who are dedicated to the undergraduate curriculum or are early adopters of new classroom technology.

Department utilization of the data further cements faculty endorsement of the ePortfolio system, as they can see evaluation results used to inform department goals and curricular development. Next steps to further faculty buy-in include expansion of faculty involvement with ePortfolios so responsibility is not limited to only a few faculty members.

We continue to work on streamlining the process by which ePortfolio artifacts are evaluated. For the undergraduate system, this could involve identifying and training alumni and other professional reviewers. Outside reviewers would provide a critical perspective of professionals in the field who are qualified to assess the degree to which our curriculum prepares professionals entering the field. Second, engaging outside reviewers can reduce the demand on department faculty to evaluate ePortfolio artifacts. Streamlined evaluation training and forms, including a Metarubric that can be used across all course artifacts, would also need to be easily accessible to outside reviewers.

Considering the graduate ePortfolio system, streamlining seems to be needed to simplify the process by which students create their personalized pages. A standardized template might afford fewer degrees of freedom for students but may increase the likelihood that the student can create their own ePortfolio page with limited time and assistance.

One drawback of our current submission system (powered by Sakai through Scholar) is that it often requires duplication of effort by students and instructors. For example, students currently submit a paper or electronic copy of an assignment to an instructor and then have to submit the same document at the department ePortfolio site. Similarly, instructors grade assignments in a course site grade book but must go to the department ePortfolio page to offer feedback on the student's ePortfolio reflection.

At the same time that we seek to streamline the effort of posting and evaluating ePortfolio items, we must expand the range of artifacts posted to the ePortfolios. This effort will distribute the workload across more faculty teaching courses associated with ePortfolio artifacts. The current ePortfolio artifacts were selected to assess student competence in perceived curricular gaps; we should now be able to determine that the gap has closed and address another area that merits attention.

We are also challenged to use available technology to document student communication competencies beyond the written word. Our university has expectations for students to demonstrate written, visual, and oral communication skills. Students can easily post visual artifacts (e.g., PDFs of brochures or instructional materials prepared by students) and video or audio recordings of oral presentations to their ePortfolios; this will be an important next step for us to take in developing our ePortfolios.

We are challenged to use the ePortfolios to support student development. Rather than simply requiring students to place items in their ePortfolios, instructors and advisors can use the ePortfolio intentionally to engage students in reflection on their learning and development. Reflection and feedback tools for students and instructors can foster more effective use of the ePortfolios.

We need to gather data on multiple cohorts to determine whether and how students use the ePortfolios to

determine how the ePortfolio can support students academically and professionally. Though portfolio use is not standard in our field, we need to remain attuned to the potential utility of professional ePortfolios for students and respond accordingly. For example, we have seen a recent and significant increase in the number of undergraduate majors planning to pursue licensure or degrees in the field of education, where ePortfolios are commonly used. Thus, it may be valuable for undergraduate students to learn how to create a personal ePortfolio prior to beginning their post-graduate work in education.

Our advice to departments considering development of an ePortfolio system for their graduate or undergraduate programs is to take the plunge into ePortfolios – albeit cautiously. Here are some important points:

- Gather data from potential end-users, students, and instructors regarding what they would like to be able to post, share, and access (for instructors/administrators).
- Make sure to educate end-users about the purpose and potential value of an ePortfolio, so that it does not appear to be a meaningless requirement. For graduate students, examples of professional opportunities gained as a result of an ePortoflio are especially convincing.
- Consult with campus support offices to learn how the university's courseware program can support a flexible ePortfolio.
- Invest some resources to develop and pilot the system, whether this entails a course release for a faculty member or hiring a graduate student assistant or consultant who is comfortable learning to use new technology and can teach others how to use it.
- Start simple in response to department need and university initiatives.
- Learn from those who have gone before (our university's engineering and education programs developed their ePortfolio systems in response to accreditation demands several years before we launched our system).
- Create a standardized ePortfolio that can be applied to all students and that can be expanded as users become more comfortable with the technology. Additions and modifications should reflect evolving needs of the department, determined at least in part by assessing the ePortfolio artifacts. While a personalized page created by students might look great, wait until students and instructors become familiar with the process before launching an option that requires greater technical and design skill.

- Work with faculty who are techno-friendly innovators; as these faculty report on ease of use, others will get on board.

Taking these steps helped us implement a manageable system, a virtually bottomless file box, which can be used with relative ease by faculty and students alike.

Conclusion

Our experience implementing the ePortfolio was quite positive. The bumps we encountered may be attributed to the newness of the Sakai software to university students and faculty. We expect that, as they become more familiar with the Sakai platform, students and faculty will soon require no assistance accessing and developing the standardized graduate and undergraduate department ePortfolios. The ePortfolio in its current format will be amended and updated as the needs of any department are not stagnant; this is a benefit of ePortfolios using the Sakai system, because the ePortfolios can change as needed. The ePortfolio demanded an iterative process managed over multiple semesters to craft a tool that collects critical information reflecting the heart of our undergraduate and graduate Human Development programs. Its success, and ongoing challenges, inspires us to continue fine-tuning our ePortfolio system to enhance student learning and our capacity to foster that learning.

References

Blair, K. L., & Monske, E. A. (2009). Developing digital literacies and professional identities: The benefits of ePortfolios in graduate education. *Journal of Literacy & Technology*, *10*(1), 40-68.

Brandes, G. M., & Boskic, N. (2008). Eportfolios: From description to analysis. *International Review of Research in Open and Distance Learning*, *9*(2), 1-17.

Cambridge, D. (2008). Universities as responsive learning organizations through competency-based assessment with electronic portfolios. *JGE: The Journal of General Education*, *57*(1), 51-64.

Chambers, S., & Wickersham, L. (2007). The electronic portfolio journey: A year later. *Education*, *127*(3), 351-360.

Ciocco, M., & Holtzman, D. (2008). E-Portfolios and the millennial students. *Journal of Continuing Higher Education*, *56*(3), 69-71.

Clark, S. B., Holmes, A; Hendricks, M., Willis, G., Griffin, E., Eskew, A.,…Zaldivar, M. (2009). *Student teams collaborate to design an assessment based electronic portfolio*. Poster presented at the Conference on Higher Education Pedagogy at Virginia Tech, Blacksburg, VA.

Cooper, T., & Love, T. (2002). Online portfolios: Issues of assessment & pedagogy. In P. Jeffery (Ed.), *Crossing borders: New frontiers of educational research*. Victoria, West Australia: AARE Inc. Coldstream. Retrieved from http://www.aare.edu.au/01pap/coo01346.htm

Donovan, B., & Iovino, R. M. (1997). *A "multiple intelligences" approach to expanding and celebrating teacher portfolios and student portfolios*. Paper presented at the Annual Meeting of the Northeastern Educational Research Association.

Gathercoal, P., Bryde, B., Mahler, J., Love, D., & McKean, G. (2002). *Preservice teacher standards and the Magnetic Connections electronic portfolio.* Paper presented at the American Educational Research Association (AERA), New Orleans, LA.

Hewett, S. (2004). Electronic portfolios: Improving instructional practices. *TechTrends*, *48*(5), 26-30.

Knott, T. W., Lohani, V. K., Griffin, O. H., Loganathan, G. V., Adel, G. T., & Wildman, T. M. (2004). Bridges for engineering education: Exploring ePortfolios in engineering education at Virginia Tech**.** Paper presented at the American Society for Engineering Education Annual Conference & Exposition. Salt Lake City, UT.

Lorenzo, G. & Ittelson, J. (2005). An overview of e-portfolios. *Educause Learning Initiative, ELI Paper, 1-28*. Retrieved from http://net.educause.edu/ir/library/pdf/ELI30 01.pdf

Meeus, W., Questier, F., & Derks, T. (2006). Open source ePortfolio: Development and implementation of an institution-wide electronic portfolio platform for students. *Educational Media International*, *43*(2), 133-145. doi:10.1080/09523980600641148

Sherry, A. C., & Bartlett, A. (2004-2005). Worth of electronic portfolios to education majors: A "two by four" perspective. *Journal of Educational Technology Systems, 33*(4), 399-419.

Strudler, N., & Wetzel, K. (2008). Costs and benefits of electronic portfolios in teacher education: Faculty perspectives. *Journal of Computing in Teacher Education*, *24*(4), 135-142.

Swan, G. (2009). Information systems in teacher preparation programs: What can we learn from a 5-year longitudinal case study of an electronic portfolio database? *Journal of Educational Computing Research*, *41*(4), 431-451. doi:10.2190/EC.41.4.c

Swigonski, M., Ward, K., Mama, R., Rodgers, J., & Belicose, R. (2006). An agenda for the future: Student portfolios in social work education. *Social Work Education*, *25*(8), 812-823. doi:10.1080/02615470600915860

Tsai, H., Lowell, K., Liu, P., MacDonald, L., & Lohr, L. (2004). Part two: Graduate student perspectives on the development of electronic portfolios. *TechTrends*, *48*(3), 56-60.

Wolf, K. (1999). *Leading the professional portfolio process for change*. Arlington Heights, IL: Skylight Professional Development.

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