

THE DIGITAL CONVERGENCE

# EXTENDING THE PORTFOLIO MODEL

Artists have a long portfolio tradition. Some start to put together their portfolios before they have had any formal training or even before they have any notion of becoming an artist. They simply begin to collect and organize their work, sharing it from time to time with family and friends, perhaps as an occasional exhibition.

Later, in the formal context of an artist's education, the portfolio becomes more than a collection of organized work—it is the critical vehicle for an artist's education and creative development. The artist brings sketches, work in progress, failed projects, and final work to class and studio sessions for discussion. Work in progress is reviewed, often privately by the instructor or artist mentor. Class sessions can involve students commenting on each other's work under the guidance of the instructor or asking for feedback about specific concerns. These interactions often continue informally with classmates or friends outside of class.

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By Gary Greenberg



The artist's portfolio is ongoing. Work carries over from class to class, year to year. Work can be stored away for future reference or can be kept close by for continued reflection. Ideas from a previous course or independent work can take on unexpected significance in a future context. From time to time, stepping back and looking over a body of work for a show or presentation can reveal new connections and directions that may not have been apparent before.

The common goal of these interactions is to help the student become an "Artist." Attending classes and taking tests are not enough. In addition, simply collecting work without getting feedback is unlikely to offer new perspectives that will help the student develop and evolve as an artist. The portfolio is thus a catalyst for this feedback—for communication and interaction with teachers, mentors, peers, colleagues, friends, and family. It provokes new ideas and new directions and facilitates reflection on and reevaluation of accomplishments. The artist's portfolio provides the foundation for a continuum of learning experiences that can evolve in unexpected ways.

### The Digital Portfolio

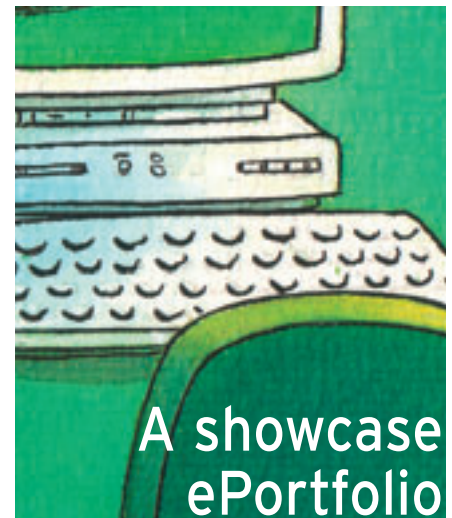
Text, graphics, sound, and video have converged into a common digital format in many disciplines. Media is now more easily created, manipulated, processed, and managed than ever before. And different media can coexist in compound multimedia documents. Perhaps most significant, the technical barriers and practical prerequisites for production have been dramatically reduced in recent years. With a common format, it is easier to keep diverse work together in one place. Without the limitations of physical space, it is possible to maintain a substantial archive of work with multiple revisions that might become important in the future. Digital convergence, affordability, and ease-of-use are creating portfolio opportunities for more disciplines while enhancing the opportunities for fields with long portfolio traditions.

Moving digital materials onto the Internet removes other obstacles to adopting the portfolio model. People no longer have to be together, at the same time and in the same place, to share work. Equally

important, the same digital materials can be reorganized and presented in different ways for different purposes, allowing the author to extend formal and informal access to more diverse audiences. Network communication tools, both synchronous and asynchronous, can be used to support ongoing interactions with mentors, colleagues, and friends—interactions that are essential to stimulating the idea exchange that has traditionally taken place face-to-face.

### ePortfolio Thinking

We are still working toward a common definition for *electronic portfolios*, or *ePortfolios*.<sup>1</sup> Ideally, all work in an electronic portfolio not only is digital but also is available on the Internet. Yet even though materials may be visible on the Web, the



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ePortfolio is not simply a personal home page with links to examples of work. In addition, unlike a typical application program, such as word processing, an ePortfolio is a network application that provides the author with administrative functions for managing and organizing work (files) created with different applications and for controlling who can see the work and who can discuss the work (access). And unlike a course management system, in which instructors manage assignments and materials within the framework of a specific course, ePortfolios are controlled by the author (student), who manages his or her work across multiple courses throughout an academic career. Finally, the benefits of ePortfolio thinking can be realized only through communication services: the exchange of comments between the author and teachers, mentors, or coaches; the discussions and peer review with classmates, colleagues, or friends; the feedback for specific questions and concerns; and the personal reflection on work in progress or completed.

It can be helpful to think about ePortfolios in terms of when the work is organized relative to when the work is created. This results in three types of ePortfolios:

1. The *showcase ePortfolio*: organization occurs after the work has been created.
2. The *structured ePortfolio*: a predefined organization exists for work that is yet to be created.
3. The *learning ePortfolio*: organization of the work evolves as the work is created.

#### *Showcase ePortfolios*

With so much material in digital form, a common starting point for ePortfolio thinking is to organize and present work that has already been created. A *showcase ePortfolio* enables the author to share specific examples of work and to control who can see these collections, most simply by setting and then distributing passwords for different audiences. Although a showcase ePortfolio may look like a personal Web page, it is much more than that. The ePortfolio author should be able to organize and manage documents stored on the Internet and to control access without knowing how to use HTML or build Web pages.

Although student showcase ePortfolios can be free-form and open, especially if students are manually creating their own Web pages and links, institutions like Pennsylvania State University (<http://portfolio.psu.edu>) find that students need some guidance if the ePortfolios are to be useful for job interviews and applications to graduate school. Commentary and reflection are also important if creating a showcase ePortfolio is to be a productive learning experience. Students' ePortfolios are intended to personalize their learning experiences, share authentic examples of work that goes beyond the grades on transcripts, help students consider career goals, and demonstrate learning from non-classroom experiences.

Providing templates for organizing work into different categories and perspectives can also help to scaffold the student showcase ePortfolio. At Elon University (<http://www.elon.edu/students/portfolio/>), ePortfolios use templates as a starting point for presenting examples of students' work, highlights from their nonacademic experiences, resumes, and

reflections on their campus experiences. Students decide how much of the template they want to use, and they control what is actually shared and who can view it.

Career ePortfolios, such as at Florida State University (<http://www.career-recruit.fsu.edu/careerportfolio/enter/login.html>), have the very specific purpose of helping students formulate career goals and successfully move on to a profession or graduate school. Students frame their accomplishments around recording, reflecting, and evaluating their experiences in and out of class and providing resumes, references, and examples of work. Of particular note is a "Skills Matrix," in which students document their experiences with examples of work done in courses, jobs or internships, volunteer work, extracurricular activities, and personal interests.

Showcase ePortfolios can also be highly professional, provocative, and intended to advance knowledge and experience in a field while bringing people together around common interests and concerns. The Knowledge Media Laboratory

(KML) at the Carnegie Foundation for the Advancement of Teaching (<http://www.carnegiefoundation.org/KML>) has developed a robust Knowledge Exchange Exhibit and Presentation (KEEP) Toolkit, which educators are using to create detailed and compelling multimedia presentations around the practice of teaching. The project has been working to make it easier for educators to present examples of their work, share ideas with colleagues, and encourage reflection and analysis. The Gallery of Teaching and Learning presents rich multimedia presentations created by teachers to document teaching and learning. The KEEP Toolkit is open source and is available free of charge from the KML Web site. KML is also working with the Open Source Portfolio Initiative (OSPI).

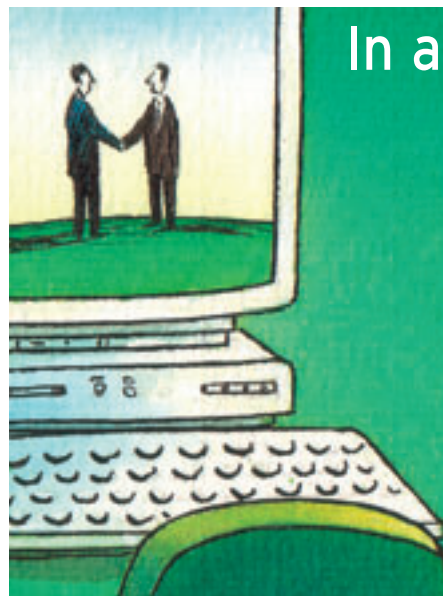
Ideally, showcase ePortfolios should go beyond simply sharing work that has been completed. They should provide a stimulating context for reflecting on a body of work in order to make new connections, personalize learning experiences, and gain insights that will influence future activities. Without supporting reflection, a showcase ePortfolio can be reduced to merely a collection of artifacts.

### *Structured ePortfolios*

Another approach is to use a *structured ePortfolio* to establish a predefined organization in anticipation of work that will be completed. In a structured ePortfolio, demonstrating accomplishments for certification or fulfillments of specific requirements is a common goal.

By clearly articulating requirements, a structured ePortfolio can effectively focus a student's time and attention. Furthermore, the predefined organization of a structured ePortfolio can make it easier for work to be systematically reviewed, evaluated, and compared. Because meeting a requirement or demonstrating a skill is not necessarily the same as taking a specific course, structured ePortfolios provide opportunities for developing new approaches to assessment.

Although some institutions are beginning to use a structured ePortfolio approach to assist with student advising and career planning, others are developing a "Learning Matrix" of formal learning objectives and student outcomes as a way to



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ensure that an institution's commitment to learning is being achieved by all students. At the Rose-Hulman Institute of Technology (<http://www.rose-hulman.edu/irpa/reps/demo/index.html>), the RosE-Portfolio includes specific learning objectives in areas such as ethics, contemporary issues, culture, and communication, as well as technical learning objectives that include problem solving, data interpretation, experiments, and design. Each objective has a descriptor of what the work should demonstrate, clarifying for the student what is expected and providing a common framework for advising on and assessing the competencies being demonstrated. Outside reviewers can play an important role in this approach by sampling student work to confirm that institutional goals are being achieved and by identifying curricular strengths and weaknesses.<sup>2</sup>

Some professions, like elementary and secondary teaching, have formal standards and certification requirements that candidates must meet regardless of the institution they are attending. The Center for Technology in Education (CTE) at Johns Hopkins University (<http://cte.jhu.edu/epweb/>) has developed a standards-based ePortfolio for teacher education as a replacement for the paper portfolios used in the Master of Arts in Teaching program. In the CTE Electronic Portfolio (EP), prospective teachers demonstrate their evolving skills in the context of established standards,

local or state certification requirements, or standards required for their field. Participants can share and discuss work with peers, request feedback from advisors, and use an online journal to reflect on their progress and growth as a teacher. At the end of a program, participants can submit their EPs for formal review and use them to showcase accomplishments for possible teaching positions.

Supported mentoring can significantly enhance structured ePortfolios. Guiding and encouraging students through a sequence of experiences will better enable them to develop the skills they need to demonstrate required competencies. Without support for mentoring, a structured ePortfolio can be reduced to a set of directions that students follow to meet seemingly arbitrary requirements.

### *Learning ePortfolios*

Whereas a showcase ePortfolio is used to organize and present accomplishments and a structured ePortfolio can ensure that specified work will be done, the organization of a *learning ePortfolio* is dynamic. The organization of work evolves over time as tasks are identified, worked on, and completed in response to the author's changing interests, requirements, and understanding. The ePortfolio author can reach back in time across official and unofficial projects to make new connections. This ongoing reorganization of work can be well-thought-out and clear, or it can be spontaneous and messy.

Essential to any learning ePortfolio are communication services. Like the artist's portfolio, the learning ePortfolio provides a dynamic context for personal interactions. Learning ePortfolios support private exchanges between the author and teachers, mentors, or coaches. They facilitate shared discussions about work in progress for formal and informal peer review. They can also enable the author to solicit feedback about specific issues and concerns. And learning ePortfolios encourage ongoing reflection that can help students better understand their learning processes. Communication and interaction in the learning ePortfolio need not be restricted to the immediate class or instructors and can include mentors, advisors, friends, and outside reviewers.

Because learning ePortfolios are ongoing, extend beyond the time frame of specific courses, and involve reorganizing work and dynamic interactions among changing communities of people, they are probably the most challenging resource to develop and maintain. Catalyst, developed by the University of Washington Center for Teaching, Learning, and Technology (CTLT) (<http://catalyst.washington.edu/>), begins to address this challenge with a collection of Web-based tools to support learning and collaboration. Students can use the Catalyst Portfolio to collect, annotate, organize, and share work for courses they are taking, for career development and planning, or for reflecting on their learning experiences. The Portfolio Project Builder can be used by instructors to guide participants (students) through the process of creating an ePortfolio. Students can work directly on interactive project pages, share and discuss work, and (re)submit work for review and comments. When a project is done, participants own the ePortfolio they have created.

The University of Washington provides a rich environment of tools and resources within which learning ePortfolios can evolve. Catalyst tools are available for creating threaded discussions, conducting peer review, and creating online surveys. Teaching guides introduce instructors to new practices, such as encouraging responsibility for learning, promoting student collaboration, facilitating discussion, and addressing diverse learning styles. Student



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Learning Outcomes, or SLOs (<http://depts.washington.edu/grading/slo/SLO-Home.htm>), built around broad university categories, are being developed for courses, departments, and majors to clearly articulate what students should know and what they should be able to do at the end of a class or program.

By exposing interactions among teachers, peers, mentors, and friends and by encouraging students to reflect on their changing understanding of what they are doing, learning ePortfolios also provide opportunities for gaining a better understanding of how students learn.<sup>3</sup> The Folio Thinking Project (<http://scil.stanford.edu/research/projects/folio.html>), a collaboration among the Royal Institute of Technology (KTH), Uppsala University, and Stanford University, is using personal learning ePortfolios to capture the artifacts and evidence of student learning and to help students use reflection to document their changing understanding. At Stanford, electronic learning portfolios (or e-folios) were used to capture formal and informal learning as students in the Class of 2002 made career decisions during their evolving four-year course of study. A new project is exploring how “folio thinking” can build engineering students’ confidence in their ability to become an engineer and can thus increase the number of prospective majors who stay in engineering (<http://scil.stanford.edu/news/efolioThinking.html>).

Perhaps the greatest challenge in supporting learning ePortfolios is enabling the necessary communication services. Because ePortfolio thinking is document/work-centric, the history of discussions and interactions is as critical to the learning process as is the evolution of the work itself. Current models of bringing work to discussions as attachments to e-mail, discussion forums, or chat sessions fragment the ongoing evolution of ideas. The result is that making connections is difficult and stepping back to see histories of interactions is almost impossible. Using ePortfolios to expose the learning process through comments, discussions, feedback, and reflection holds perhaps the greatest promise for advancing student learning and achievement and supporting new models for learning.

### **Opportunities**

#### *Authentic Assessment*

By providing new ways of presenting evidence of student achievement, electronic portfolios offer additional opportunities for thinking about assessment. When demonstrating accomplishments is the goal, ePortfolios can offer greater flexibility for when, where, and how requirements are addressed than can the typical course schedule, with specific start and end dates and meeting times. Electronic portfolios can also expose aspects of the learning process in ways that can make assessment more authentic and revealing

than is possible with traditional testing. This is especially significant when process is as important as product, such as with collaborative group projects, or when different learning styles need to be accommodated. If ePortfolios can offer students more and perhaps better ways to demonstrate skills and achievement, we may need to rethink the traditional course structure and credit system.

### *Lifelong ePortfolios*

Maintaining an ePortfolio beyond the college and university years can have long-term personal and professional benefits, supporting both formal and informal lifelong learning. Given the changing economy and job market, a showcase ePortfolio can play an important role in redefining oneself for new career opportunities. When certification and a demonstration of skills are needed for career advancement, an ePortfolio can be an important way to present and maintain information about accomplishments for professional accreditation.

By providing the framework for both formal and informal learning, ePortfolios can encourage ongoing personal and professional development long after an official course of studies has been completed. Engaging new mentors and colleagues over time to review and discuss self-directed projects, while continuing to reflect on and make connections with previous work, allows the ePortfolio author to use formal education as a springboard for continued professional and personal growth.

An important benefit of ongoing ePortfolio participation is the opportunity to maintain connections with peers and mentors throughout one's professional career. This can be especially important in areas like K–12 teaching, where isolation and the need for ongoing professional development have created significant retention problems. Cohort groups that are formed during a teacher-education program and that extend through pre-service and in-service teaching experiences can establish an ongoing community of practice that is sustained as teachers pursue their careers.

### **Challenges**

Electronic portfolios provide a starting point for the type of learning communi-



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ties that higher education will need to offer future students—students who will be experienced with ongoing, self-directed learning by the time they enter a college or university. With K–12 school districts starting to implement electronic portfolios to support more authentic, long-term assessment of student achievement, college and university admissions officers should not be surprised to see submissions of student ePortfolios showcasing accomplishments that do not appear on transcripts and that are not reflected in standardized tests or advanced placement exams. These students are already quite comfortable using the Internet and basic applications programs, communicating and interacting online, and increasingly, doing their own multimedia production. More significant, they are already using professional databases,


archives, and tools that are readily available on the Internet to explore and share personal interests while developing impressive expertise on their own.

Becoming an artist, becoming *anything*—an engineer, a historian, a chemist, a sociologist—is hard work. Today, the portfolio approach long used with art students is being adapted for use with all students. The digital convergence of text, graphics, sound, and video is making the portfolio model of organizing and sharing work and engaging mentors, peers, colleagues, friends, and family in ongoing discussions and feedback available to many disciplines and programs. The electronic portfolio will play an important role in anticipating the learning environment expected by future college and university students. **e**

### **Notes**

1. For additional resources on electronic portfolios, see the following Web sites: AAHE (American Association for Higher Education), Electronic Portfolios, Resources for Higher Education, <<http://webcenter1.aaher.org/electronicportfolios/index.html>>; the Electronic Portfolio Consortium (ePortConsortium), <<http://www.eportconsortium.org/>>; EDUCAUSE, NLII (National Learning Infrastructure Initiative), Electronic Portfolios, <<http://www.educause.edu/nlii/keythemes/eportfolios.asp>>.
2. Gloria Martin Rogers and Julia Williams, "Building a Better Portfolio," *PRISM Online* (January 1999), <[http://www.asee.org/prism/january/html/building\\_a\\_better\\_portfolio.html](http://www.asee.org/prism/january/html/building_a_better_portfolio.html)> (accessed May 5, 2004).
3. Helen L. Chen and Cynthia Mazow, "Electronic Learning Portfolios and Student Affairs," *NASPA NetResults* (October 28, 2002), <<http://www.naspa.org/netresults/PrinterFriendly.cfm?ID=825>> (accessed May 5, 2004).

### **RELATED RESOURCE**

 The Electronic Portfolio Action Committee (E-PAC) Virtual Community of Practice ([http://www.educause.edu/vcop/e\\_port.asp](http://www.educause.edu/vcop/e_port.asp)) is jointly sponsored by the EDUCAUSE National Learning Infrastructure Initiative (NLII) and the American Association for Higher Education. Composed of researchers, faculty, assessment experts, and technology developers, E-PAC focuses on the creation, use, publication, and evaluation of electronic portfolio projects and tools in higher education and beyond.