The Current Status of ePortfolio Research & Development

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The substantial advantage of adopting ePortfolio-based learning and assessment has been evidenced by a growing body of researchers (Cole, Ryan, & Kirk, 1995; Frey, 1995; Kim, 2004; Lehman & Richardson, 2003; Russell & Butcher, 1999) and increasingly acknowledged by accreditation agencies broadly (e.g., NCATE, WASC, ABET).

The European Institute of ELearning (EIfEL) set up a Europortfolio group with an objective to "engage upon an orchestrated effort involving both educational and corporate institutions to define, design, and develop portfolio systems that meet the needs of all stakeholders." (EIfEL, 2007). The Australian ePortfolio Project was awarded to a consortium of four universities - Queensland University of Technology, The University of Melbourne, University of New England and University of Wollongong - to, amongst other goals, "provide an overview and analysis of the national and international ePortfolio contexts, document the types of ePortfolios used in Australian higher education," and "identify any significant issues relating to ePortfolio implementation" (AeP, 2008). In US, Lorenzo and Ittelson (2005) presented a series of examples of ePortfolio implementation by various organizations in the nation. The premier example is eFolio Minnesota, considered the first statewide ePortfolio system in the US. The system provides every resident in the state of Minnesota a free lifetime access to its ePortfolio system. (http://www.efoliominnesota.com/).

While various types of portfolio strategies are being adopted in numerous educational settings, the rapid advancement of digital and communication technologies are making it possible for innovative designs, implementations, and applications of portfolios and digital portfolio systems. For example, Stanford University has launched a 20-million dollar research project to investigate and develop future ePortfolio systems based on multidisciplinary research through POMI (Programmable Open Mobile Internet [http://cleanslate.stanford.edu] project. The test bed for the prototype ePortfolio system will be California higher education system including University of California, California State University, and California Community College System altogether totaling about 4 million students. For this large-scale research project, Stanford University has signed a collaboration MOU with the California state educational technology initiative. From this collaboration, the University seeks to find the implications of digital asset management and visualization in formal and informal learning environments, empowerment opportunities using innovative communication technologies,

and efficient ways of competency-based workforce training and placement for the global economy and society.

There is also significant development initiative in the private sector. One good example is the Epsilen ePortfolio. An Information Technology professor, Dr. Ali Jafari. at IUPUI (Indiana University-Purdue University Indianapolis) edited the first handbook of research on ePortfolios and also initiated Epsilen venture. Currently, The New York Times is heavily funding the initiative as a commercial service to academic enterprises worldwide. Many schools and students in various disciplines including engineering, science, and nursing education take advantage of Epsilen ePortfolio.

Overall, there is continuous interest in ePortfolio research and entrepreneurship projects around the world. With the rapid advancement of information and communication technologies, ePortfolios will continue to evolve and strive to meet the needs of emerging teaching and learning strategies of the digital age and also the tastes of young student generation that is highly proficient with new types of digital communication technologies.

ePortfolio-based Assessment

Besides the discussions on ePortfolio implementation and further development, there are also active debates on how one should examine learning outcomes reflected in an ePortfolio. In regards to the evaluation of completed portfolios, Russell, J. D. & Butcher, C. (1999) states that: *At the end of the course, the complete portfolio is evaluated in terms of how well the portfolio "hangs together" as an integrated product. How well do the pieces fit together to support a student's understanding of the selected topic? Is the portfolio well organized, making it easy to locate specific items? Is the work neatly arranged and attractively presented? A well-organized portfolio is helpful in demonstrating student's skills and abilities to current and/or future employers. (P. 3)* Therefore, it is obvious that ePortfolio systems offering simple web-based storage and checklist would not accurately reflect the breadth and depth of student learning.

If an ePortfolio system is to serve more than a checklist system, it needs to be structured as a learning space where students can visually express not only conceptual understandings, but also demonstrate the integrity of their mental cognitive structure with supporting evidences linked to the required competencies. Also, the system must provide the student with features that promote and support collaboration, communication, and reflection leading to a lifetime professional development. These certainly create numerous challenges for higher education enterprises.

Challenges

Currently, education (i.e., especially teacher education program) and art schools are the most active users of ePortfolios. An increasing number of schools in other disciplines are either considering or using basic e-portfolio systems, but the use is still limited and most are at early development or experimental stages. There are several reasons for schools (e.g., engineering) are facing challenges. Even in engineering schools alone, there are many programs such as computer engineering, electrical engineering, or mechanical engineering which demonstrate highly idiosyncratic program goals and objectives. Therefore, it is not easy to establish "one-size-fits-all" guidelines or strategies. In addition, even if a higher education enterprise adopts an ePortfolio system, its faculty may not adopt the system or may not know how to integrate in traditional teaching practices. ePortfolio systems certainly require significant time commitment for everyone. Those who adopt often fail to plan and execute a set of reasonable and consistent evaluation strategies of portfolios. Also, the adopting enterprise may not realize the required resources for faculty training or technical support required for the life time of ePortfolio systems.

Opportunities

Although there are substantial number of challenges, there are also notable benefits and opportunities for all con-

stituencies of higher education enterprises.

The student feels the sense of achievement when the project, course, or degree program work is visually organized and professionally presented to peers, the instructor, parents, or potential employers. The student feels the sense of satisfaction when they can demonstrate competencies (e.g., through presentation videos, project websites, multimedia objects) beyond their paper resume. The student feels the sense of convenience when they can easily collect, share, organize, archive, or visualize a wide variety of digital assets they gather or generate through their years of academic experiences in multiple departments and institutions. Another area of convenience student enjoys is the page where students can check their overall degree and credentialing progress and choose various fields (e.g., grades, certificate, faculty comments, etc.) they want to present along with their ePortfolios. The student also feels the sense of assurance when they can tailor their ePortfolios to meet the various sets of requirements of multiple constituencies (e.g., different potential employers in different sectors). Literally, this is just-in-time presentation for arising needs of academic and professional endeavors. For this, various supporting resources (i.e., professional writing, creative presentations, multimedia development, etc.) are needed to encourage students to communicate their competencies and skill sets professionally.

The faculty also feels the sense of convenience if they can review assessment results and enter their feedback all in one place without extra burden of keeping a separate excel spreadsheet. Also, those who are in the curriculum planning level feels the sense of empowerment when they can conduct various statistical analyses using the data in ePortfolio systems. For example, an academic chair can access datasets linked to student admission, academic progress, internship, and placement data to investigate the program effectiveness research or accountability assessment linked to specific course, program feature, faculty evaluation, etc.

The alumni will find a great sense of connectedness when they can continue to develop and augment ePortfolio systems for career advancement and professional development endeavors. They can also serve as cooperative mentors for current students when they can communicate through the ePortfolio systems. Obviously, having a tight relationship with the alumni will help the administrators of the university with various development projects.

The administration will find such ePortfolio infrastructure highly beneficial because a well designed and operated ePortfolio system will provide an evidence of academic development, student learning outcome, and necessary documentation for accreditation visits.

The potential employers will find such ePortfolio system quite handy as well. They will be examining student ePortfolios before and after graduation. They not only access resume databases, but also review actual course projects along with faculty remarks and internship evaluations. They can directly contact the students, faculty, and career placement team to discuss student career development and job placement opportunities.

The community (e.g., people in general who are interested in helping the university) often access ePortfolio systems to serve as academic and career advisors. The participants from the community could be business entrepreneurs, teachers, parents, philanthropic organizations, etc. In order to recognize the contributions made by the participating community members, the University may offer continuing study program options (e.g., for free or specially discounted prices) to the actively participating members.

The life-long learning opportunities would be the means of strengthening the community outreach program and at the same time tokens of appreciation for the contributor.

Conclusion
As discussed above, using ePortfolios in an academic pro-

gram promotes and supports student creativity, innovative thinking, reflection, communication, and possibly collaboration in multiple levels. In any portfolio system development case, curriculum standards must drive the design of a portfolio system with necessary features and capabilities. A great level of involvement from the faculty is necessary because it is still the faculty who will need to integrate such innovative learning and assessment strategies in the very curriculum they design and guide students to use in classes. Only the successful integration of ePortfolios in daily teaching practices will make all the identified opportunities come alive. The faculty must carefully cater the curriculum and course activities to promote self-reflection as well as support team-reflection on specific tasks, learning stimuli, and outcomes. Also, the faculty must be committed to provide clear expectations, timely feedback, and enough chances for student to present their work for feedback from all constituencies.

ePortfolio systems certainly offer a set of educational development strategies for individual students and faculty while providing a tremendous leverage for the university to promote and achieve academic excellence (i.e., accreditation, academic counseling, community alliance-building, job placement, etc.) It is important for a university to provide the adequate level of support through centralized information technology department and also training through teaching and learning centers.

With successful research and development efforts such as POMI (Programmable Open Mobile Internet) project, future ePortfolio systems will be becoming much more intelligent holistic competency expression tools for students while evolving into sophisticated proficiency-matching systems capable of identifying talents required for the 21st century global economy. Such capacities will become possible with emerging technologies such as semantic web databases coupled with cloud computing. These are the topics for multidisciplinary research studies (i.e., involving computer science, education, business school, etc.) today.

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8. Russell, J. D., & Butcher, C. (1999). Using portfolios in educational technology courses. Journal of Technology and Teacher Education, 7(4), 279-289.

Appendix

1. Example of student ePortfolios:
2. http://stanfordsuse391.ning.com/
3. http://www.epsilen.com/jalstadt
4. http://www.eportfolio.lagcc.cuny.edu/basic_gallery.html
5. http://ldt.stanford.edu/~sorcar/courses/autumn/autumn.htm
6. http://ldt.stanford.edu/~inokon/portfolio_outbreak.htm
7. http://www2.warwick.ac.uk/fac/sci/dcs/people/Sarabjot_Anand/
8. Handbook of Research on EPortfolios
   http://www.igi-pub.com/reference/details.asp?id=5072

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