E-Portfolios: Benefits, Challenges and the Pedagogical Debate

Introduction

What is an e-portfolio? If you have not heard the term yet, it presumably won't be long until you hear the term over and over again as this topic has become increasingly popular in higher education circles in both the pedagogy and technical aspects of this rapidly emerging trend. So to answer the question of what an e-portfolio is, we must first define a portfolio. A portfolio is commonly referred to as a collection of student work that has been collected, purposely selected, presented and reflected upon by the student who owns the material. The purpose of these portfolios is to show the growth and understanding the student has developed over the course of their educational term covered by the portfolio. (Barrett, 2006). Why are portfolios important? According to Strudler and Wetzel (2005) the study by Salzman, Denner & Harris (2002) proved that 89% of educational colleges reported the use of some type of portfolio. So what then is an e-portfolio? An e-Portfolio is a portfolio similar in scope to a traditional portfolio (a traditional portfolio usually contains paper bound folders or containers with loose paper artifacts) as it contains roughly the same type of information, however it does so in a digital manor. An e-portfolio can take many forms; it can be on a hard drive, a small portable flash drive (such as a USB flash drive), on CD or DVD or entirely on the Web accessible to the world via the Internet. For the purpose of this paper it will be assumed that when referring to e-portfolios we will be referring to digital portfolios that exist on the Web. E-portfolios have emerged in recent years as an alternative to traditional portfolios due to the simplicity of converting student works into digital form, where once
it would have been time consuming and laborious to transcribe hand written artifacts into
electronic documents, it is no longer the case. It has been stated that in higher education
institutions most students’ work is created in digital form prior to being placed into an e-
portfolio (as most work is in electronic format for papers, reports, proposals, solutions,
experiments, reflections, and presentations). (Batson, 2002). E-Portfolios not only serve
as electronic showcases for students; educators, researchers, and professionals can also
use them. The flexibility and robust scalability of e-portfolios has gained this new
technology praise and attention in the world of higher education as indicated by several e-
portfolio researchers. “Electronic Portfolios have been described as the next big thing in
higher education computing” (Barrett, 2006, p4). “The term ‘electronic portfolio’, or ‘e-
portfolio’, is on everyone’s lips…[e-portfolios] seem to be the beginning a new wave of
technology development in higher education.” (Batson, 2002, p1). “Increasingly,
portfolios are being required of educators for university graduation, licensure,
employment, and evaluation.” (Heath, 2005, p66).

With all of the hype surrounding e-portfolios it is important to look at the
adoption of this new technology in higher education institutions. This paper is going to
focus on the technology, and its benefits and drawbacks, the pedagogical uses, and then
explore the potential gain or loss in choosing to adopt this technology. The conclusions
that are to be drawn shall be based upon the literature review of previous researchers and
are intended to further the discussion of e-portfolios in higher education institutions and
the possible uses of this technology at both the individual level (students, educators,
professionals) and the organizational level (educational institution).

E-Portfolio Usage
As mentioned previously e-portfolios can take several forms physically, however, e-portfolios can also take many thematic forms as well. Using the scope in this paper that all e-portfolios are on the Web, we can then better look at the thematic differences of the different types of e-portfolios. Most e-portfolios that exist in a higher education institution will contain a mixture of key functions. Educational program planning, documentation of skills, abilities, and learning as well as program development, job searching, course evaluations and performance monitoring are all key functions of an e-portfolio commonly found in the higher education realm. (Wick, 2004, p4-5). Not all e-portfolios will contain all or any of those key functions but it is very common to find those throughout the different types of portfolios created. With some exceptions, most e-portfolios will fall under three different types of themed collections. First you have the e-portfolio for educators, this type of portfolio will contain the achievements of an educator throughout their career. These portfolios tend to be large in the actual quantity of work samples that are contained within the structure of their e-portfolio. The purpose of the educator’s portfolio is not only to showcase their achievements, but to also proliferate their field of study in a way that their portfolio becomes a portal of information relevant to their research and teachings. (Heath, 2005). In contrast, the student e-portfolio is usually one of many selected scholastic achievements that highlight and exemplify their learning and growth over time. These portfolios serve many purposes, including but not limited to, a virtual showcase of knowledge and skills to be viewed by both prospective employers and graduate programs and a pedagogical instrument for education institutions to apply student assessments (we will discuss this in more detail in following sections). (Carliner, 2005). The third type of e-portfolio is that of the professional. The
professional e-portfolio is mainly concerned with two facets. The first being the virtual resume where they are able to better elaborate and clarify real experiences and demonstrate skills and abilities far above and beyond what can be expressed in a standard one page paper resume. Secondly, the professional portfolio can also be used in many ways for career development by way of peer and mentor reviews. (Wick, 2004). When looking at the adoption of e-portfolios as an organizational implementation of a higher education institution one must evaluate the benefits and drawbacks of implementing such a technology. There are several considerations that need to be made before an educated decision can be made.

**Advantages of E-Portfolios**

One of the biggest perceived advantages of e-portfolio implementation to the individual is the ability to publish an enhanced and polished virtual resume, both prior to and following graduation. It has been the thought that if prospective employers can see the actual work of the students that they will be more likely to get the “big” job by showing that they have an advantage over their competition by letting their work speak for itself. Additionally, faculty and staff members also view e-portfolios as advantageous resume builders. Educators can provide student samples to provide proof of teaching excellence as well adding their own research findings, publications and presentations. (Batson, 2002, p2). For professionals, either newly in their career or those who are highly skilled, e-portfolios allow them to advance their career by using portfolios to demonstrate their skills, and show what projects they have been involved as well as what success they have achieved. (Carliner, 2005, p73). The advantages of e-portfolio implementation is not limited to the individuals either, the higher education institution
stands to gain from this technology at the organizational level as well. The higher education institutions can gain advantages by using e-portfolios for creating a system of tracking student work and progress through their programs of study. They can use this system to have faculty reflect on an item in a student’s portfolio and provide feedback as to the developmental process that the student has made, or perhaps needs to make. This same system can also be used to collectively retain and view student work for an entire course, program or degree to see the growth and progress of all students in a particular field of study. This information can then be used to better assess the courses and the learning objectives being taught to try and facilitate the best possible learning criteria for those courses. Ultimately the academic units would be able to integrate the use of new methods and goal orientated curricula into their programs based upon the results they see from the student portfolios. (Batson, 2002). Looking at the technological benefits of e-portfolios there seems to be a clear understanding of how this technology is advantageous. Currently the majority of work that is created and published by students, faculty members, and professionals alike is already in electronic format, which eases the burden of supplying items or “artifacts” as they are commonly referred to. Rather than print a copy of all your collected work and build a paper “hard copy” that you have to manually arrange and manage. With electronic portfolios you can easily store the original electronic copy that is easier to organize and allow access to. These documents also then become easier to update and modify. Also, for some types of artifacts (such as presentations and video) there is no substitution for digital media, meaning a PowerPoint presentation is not nearly as effective in presentation if it is viewed on printed paper slides as you loose the “special” qualities such as transitional effects, sound, video and
the ability to see the items more clearly. Similarly, video cannot be reproduced on paper so a physical copy would have to be included in a traditional portfolio where the person(s) viewing the portfolio would have to go out of their way to view the contents by arranging a video player of some sort as opposed to the electronic format where they simply need only to click on your item to watch it. Another technological advantage of e-portfolios is that they support complex organizations and structures of your electronic artifacts. With a traditional paper system you are forced to have a linear form in which one stack of papers is on top of another. With e-portfolios you have complete control over the hierarchy of the artifacts you choose to display, you can link directly in a linear fashion, or create complex linkages from one artifact to another based on relevance and personal direction. In addition to being highly flexible e-portfolios are also very easy to reproduce and access. In terms of this paper we are only focusing on the Web as a medium in which portfolios have the ultimate access, as they can be seen by anyone with an Internet connection. With an electronic portfolio the author not only has the ability to reproduce the contents but also has the ability determine the amount of access people have to their artifacts. E-portfolios allow for a very fluid access scheme where multiple levels of access can be predetermined as opposed to a traditional paper system in which you may have to custom arrange several different types of portfolios and keep them organized and sorted. Some situations may require different people having different levels of access, an example of this would be letting “everyone” have access to your main portfolio but with limited access to material while allowing a prospective employer have full access so they can see all of your material. Finally e-portfolios also are an excellent way to demonstrate technical skills. (Heath, 2005, p67-68). Simply using a web based e-
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portfolio system will showcase your ability to use technical applications to both produce and maintain a system of varying complexity. By using other technical skills individuals may be able to create very aesthetically pleasing web presence that will further enhance their “web presence” and give them a competitive advantage over their competition.

**Challenges of E-Portfolios**

Given the wide range of advantages of e-portfolios it seems to make perfect sense for all higher education institutions to go forward with this technology and implement it right? Well not so fast, as it happens there are several challenges to implementing e-portfolios that effect not only the organization, but individuals as well. One of the predominant challenges from the organizational level with e-portfolios is the issue of standards and compliance. Although e-portfolios can deliver an incredible increase in the quality of deliverables and access, they also are inherently troublesome when dealing with universal standards. The technology used to develop e-portfolios becomes a concern due to the fact that portfolios developed on one platform using specific authoring software may not transfer easily to another software platform at a later time. This raises the issue of interoperability of the portfolios given that although some authoring software is free, it does not mean that the data from one portfolio system to another will be interchangeable. (Carliner, 2005, p75). This issue forces the organization to make a decision and choose a platform or software that is “suitable” for the majority of the individuals and organization itself. For e-portfolios to reach their potential benefits it is argued that they must meet and comply with the interoperability of document format, accessibility, authentication, and data formats. (Mason, Pegler & Weller, 2004, p719). The issue of standards is starting to be addressed by the IMS Global Learning
Consortium in which they are attempting to produce specific standards of profile content and other related elements of e-portfolios. (Mason et al, 2004; Carliner, 2005). In addition to the issues regarding standardization, another major challenge facing e-portfolio adoption and dispersal is the issue of storage and security. Storage is a major concern for e-portfolios in higher education institutions. The great debate comes with the amount of storage each student, educator, and professional should receive. (Batson, 2002, p3). Although it is a common notion that storage space (electronic storage) is getting cheaper consistently, it still remains an issue when you start dealing with numerous quantities of multimedia files that can be quite large in size. On top of storage space concerns, there also exists the question as to the duration of time e-portfolios are kept. Managing large quantities of e-portfolios indefinitely is certainly going to be an increased hidden cost of implementing e-portfolios due to the fact that the organizations will have to employ staff members to manage the large data sets in addition to the physical equipment required. Assuming the data is stored indefinitely what will be the implications of the advent of newer storage mediums? Data stored on old media formats is not easily accessed once that media is out of circulation, so that may require additional costs of ownership if the current data will need to be transferred to a newer medium at some point down the road. Security is also a notable challenge to the adoption and deployment of e-portfolios. Is all the information in an e-portfolio to be considered private or public, or to what degree is it a mixture? In this area of security there are lots of questions that have yet to be answered in regards to how does one maintain security on electronic data indefinitely. Batson argues that before e-portfolios will be deployed they will have to transform the e-portfolio system to that of an enterprise application that
keeps data secure from end-to-end, requiring a large overhead of communication and coordination from central data services. (Batson, 2002, p3). Taking a closer look at the individual level, authenticity, evaluation, and development are other challenges to e-portfolio adoption. With the advancement of electronic publications also comes the increased ease by which individuals can include samples of work in their portfolio that do not belong to them. This raises the question of developing an evaluation system to better identify original works and add credibility to the information that is published. With this comes the issue of evaluation, a difficult challenge that exists. Given the fact that e-portfolios are a relatively new technological trend and the standards are still unclear there is considerably less information on the processes of evaluating such portfolios. For e-portfolios to reach their true potential the use of evaluation and review form educators, career advisors and certification specialists is paramount. (Carliner, 2005, p75). The development of e-portfolios can also raise challenges, as it can be very time consuming, expensive, and disappointing. Higher education institutions have determined through their experience that the “do-it-yourself” e-portfolio creation is very difficult to support. This difficulty in support has led to the adoption of many open source and commercial electronic portfolio services and systems. (Barrett, 2006, p2). Even with the use of a designed e-portfolio service there still remains several challenges to the individual when setting out to create a portfolio. As stated previously, creating e-portfolios can become very time consuming for the individuals involved and this could result in a lack of motivation to use the e-portfolio system leaving it underutilized. The process of creating e-portfolios may also become stressful. It is rarely the case that technology always works in the way it was intended. This could promote a negative motivational use factor if the
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e-portfoli0 system is laden with “bugs” or consistent failures. Creating e-portfolios can also be an expensive endeavor for the individuals as in the case of purchasing new software (if needed) and or developing new technological skills to operate the software needed to develop e-portfolios. Finally, e-portfolios run the risk of being disappointing to the end users. If the e-portfolios cannot deliver a publication that meets the needs and expectations of the users then the motivation to use the system will ultimately decline and possibly fade into failure as the users look to other alternatives to achieve their goals of portfolio publications. (Heath, 2005, p68-9).

The Pedagogical Debate

When looking at the adoption of electronic portfolios, so far this paper has highlighted some of the key advantages as well as some of the challenges that stand in the way of e-portfolio adoption. Thus far the scope of the review has pertained to the technological and personal gains and challenges to developing and implementing electronic portfolios for students, educators and professionals as well as the organization as a whole. In this section the focus is going to shift to that of the pedagogical views on how the electronic portfolio system should be used in a higher education institution (specifically looking at the effects on student portfolios). It has been argued that the process of e-portfolio adoption in higher education has been too focused on the technological process and not enough attention has been paid to the pedagogy of electronic portfolios. (Attwell, 2005). In the realm of electronic portfolio pedagogy there is two main forms that have emerged as the predominant uses in higher education institutions. These two approaches are formative and summative, the use of which has been the subject of debate as to the most appropriate form of use and how that use
impacts the organization and individuals that has chosen to adopt it. According the Assessment Reform Group, “assessment for learning is the process of seeking and interpreting evidence to decide where the learners are in their learning, where they need to go and how best to get there.” (Assessment Reform Group, 2002). First looking at the formative style of electronic portfolios, you can see that in the creation of portfolios the artifacts are selected by students that “tell their story” of how their learning has progressed. Their portfolios are then stored for the duration of their class program and degree. The goal of this approach is that the artifacts are viewed by others (as well as themselves) and feedback is given on how to improve learning. This process focuses on formative assessment by addressing the learning needs in the future, as well as showcasing how the learner has improved over previous work. The Assessment Reform Group also indicated that according to their research, when electronic portfolios are used for formative assessment they have the potential to improve the students self-esteem in their educational careers. This is in contrast to the findings when looking at electronic portfolios as an assessment of learning where students are required to submit specific artifacts that are mandated by the higher education institution for use of instruction. Unlike the formative portfolios the summative portfolios are not reviewed by peers and educators for feedback and growth, instead the portfolios are measured on quantitative data that is reviewed for measurement purposes. The summative portfolio is structures around a predetermined goal standard that is used to make decisions on the learning process of a class, program or degree. Furthermore, the Assessment Reform Group states that research shows a negative effect on student motivation to learn when using

It has also been stated that:

“When portfolios are used for accountability purposes, to document pre-service teachers’ achievement of standards-based competencies, teacher candidates viewed their portfolios as a hoop they needed to jump through to graduate, and not the lifelong reflective tool that had been envisioned.” (Barrett & Carney, 2005, p3).

In contrast the two highlighted forms of pedagogical use (formative and summative) have very different goals and potential outcomes. The resulting issue is the debate on which method is best used for a particular educational institution.

Some additional issues concerning the pedagogical use of electronic portfolios is the amount of literacy competence required. Literacy in terms that exclude the narrow focus (reading, writing, etc.) but rather that of the broader sense known as digital literacy which defines the ability to perform reflections and make judgments based upon those reflections in digital form. (Attwell, 2005, p4). This creates a pedagogical issue if there is a disparity among the key stakeholders in the e-portfolio deployment based on their digital competence and literacy. If the individuals who are responsible for the review and feedback of a portfolio and those of the content producers and reflectors cannot meet upon common ground then their communications will most likely go underutilized as neither party will be able to effectively implement the input from the other. Another issue dealing with the pedagogy of electronic portfolios is the adoption of the specific technology to be used as the platform for the portfolio system. When considering the technology to be adopted be it only software, or a combination of software and hardware
it is important to ensure that the pedagogical and technological requirements are cohesive and that one side does not predominately prohibit the other. It would be unproductive to have a technological marvel of a portfolio system that fails to meet the needs of the higher education institution. Likewise, it would be equally as unproductive to have a sound pedagogical framework for the development of e-portfolios and no technology to facilitate the creation of the portfolios. Attwell addresses this concern by stating:

“...problems in establishing the pedagogic processes and meanings behind new educational technology. Technology is not pedagogically neutral. All technologies, be it intentionally or otherwise, facilitate or constrain particular pedagogic approaches and methods. The contexts in which educational technology is used may greatly influence pedagogic approaches.” (Attwell, 2005, p6).

The preceding issues of pedagogy all illustrate that there needs to be a fine balance of assessment both of and for learning. This balance will also have to be conducive to the technology platform selected to best allow for a productive and meaningful deployment and long standing adoption of electronic portfolios.

Discussion

“Electronic Portfolios have been described as the next big thing in higher education computing” (Barrett, 2006, p4). With the rise of electronic portfolios also comes the pressure of adopting this emergent technology trend. Higher educational institutions around the country (and presumably the world) will be paying close attention to the developmental process of electronic portfolios in the near future if they are not currently doing so. E-portfolios have gained momentum in the higher education realm
and will likely be on the forefront of organizational decision making. Even if e-portfolios hit the higher education institutions around the globe as an enormous technological tidal wave that will reshape the student-learning environment, it may do so at an individual, case-by-case scenario for each institution. Electronic portfolios seem to be coming whether the educational institutions are ready for them or not. This leaves the individual higher education organization to make several decisions on how it will adopt and or embrace this new technology and use it to its advantage to further the learning process for not only the students, but the educators and professionals as well. The decision on how best to adopt e-portfolios is not one that is easily determined. There are many factors that can contribute to the successful or ineffective deployment of an organizational implementation of an e-portfolio system. The determining factors as described earlier in this paper are the beneficial uses of e-portfolios, the technical challenges and the pedagogical concerns with the system. Although it is quite clear that there is a distinct advantage both educationally and professionally for having developed an electronic portfolio the question becomes how can an organization implement a system that is equally beneficial not only to the users of this new system but to the organization itself. Would a University install and maintain an electronic portfolio system that was purely a “value-add” service for its students without any pedagogical or logistical constraints? Although this scenario seems unlikely it may need to be considered. When approaching the developmental stages of e-portfolio systems the organization would be best to clearly define an outline at the highest organizational level of what they want their portfolio system to achieve. The decision of what is to be achieved including the benefit to educational community, organizational benefits as well as the pedagogical attributes
needs to be established before a system can be reviewed or devised. Once the decision has been made as to the electronic portfolios “place” in the organization, then keen attention must be paid to the costs of this implementation. One of the primary struggles will be to identify if there are any open source, or commercial solutions available that suit the need of the organization. It would be possible for an educational institution to develop its own, however this endeavor will be extremely costly in both equipment and human capital. When selecting the e-portfolio system the organization needs to not only ensure it fits their needs, they also need to forecast the technical usability issues that may arise from the deployment of the new system. Many new technology services will require end-user training. At some level the users of the system will have to be trained on how to use the system, so this facet of the deployment should not be overlooked as the higher the complexity of the user interface the more training will likely be required.

Besides the technical and logistical implications when implementing an e-portfolio system there also exists the pedagogical concerns. The scope and use of the electronic portfolios will be key to its long-term success as both a learning tool and for reshaping the learners’ experience. The organization will have to make a choice on how the electronic portfolios are best used. If the entire system is structures to support more of a summative structure, then the system faces the potential collapse, as students, educators and professionals alike will fail to use the system on the basis that it is perceived as a mandated task, rather than an opportunity for personal growth. This system may give the organization an increased logistical and quantitative advantage, but does not cater to the needs or desires of the users. If users of the system become dissatisfied with the use of the portfolio then they will be disinclined to use the system.
and it may become nothing more than an expensive additional course management tool. On the other hand, if the organization deploys an e-portfolio system that is formative in nature they will allow for the increased user perceived value and learning experience. This form of portfolio system will be beneficial to both the individual users as well as the educational institution as it fosters a reflective perspective on what has been learned, and what should be learned in the future.

Another point of discussion that can be raised when considering the adoption of electronic portfolios is the curriculum in the educational institutions. A very common model of learning and instruction in higher education classrooms involves lecture-based courses in which a student’s competency is tested by way of examination. This model may prove well for testing the students’ knowledge of a subject, but little is offered as to the learning that has progressed in that course. So for the adoption of electronic portfolios it may be beneficial to have several areas of the educational institution replace the measurement tools from tests and examinations (or at least be reduced) and replaced with more qualitative forms of work. In this way the individuals will be learning and striving to create useful reflective pieces of work that best exemplify their learning experiences. By way of association this would also reflect positively on the organization as evidence of teaching excellence.

All things considered, e-portfolios are relatively new in the world of higher education, yet they will be a formidable technology that will soon dominate the decision-making procedures at many institutions around the world. The success of this technology is riding on the further development and adoption of this technology in higher educational institutions where it can offer a great opportunity for change.
Works Cited


Carliner, Saul. (2005). E-Portfolio: The tool that can increase your marketability and refine your skill development efforts. *E-Portfolio*, 59, 70-75.


Strudler, Neal., & Wetzel, Keith. (2005). The Diffusion of Electronic Portfolios in