Technology Integration with Standards-Based eFolio for K-12 In-Service Teachers

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Abstract: Electronic portfolio serves not only as a depository of a student's works for future employers or certification but also a powerful tool for technology integration for K-12 teachers. This paper reports on the pros and cons on the use of “eFolio Minnesota” for K-12 in-service teachers at a graduate program. This paper also reflects on the process of incorporating the technology standards established by the International Society for Technology in Education (ISTE) in projects to demonstrate technology competency of the in-service teachers.

Keywords: technology integration, standards-based e-folio, in-service teachers, digital teaching portfolio

Introduction

As electronic portfolio becomes the mainstream assessment method for teacher education programs in higher education, K-12 in-service teachers have also increasingly utilized the system for creating technology-enhanced curriculum and demonstrating their technology competency. However, most of the reports from the field on the use of electronic portfolio focus on the following three processes: technology skill development, pre-service teacher training (i.e., college training for students to become teachers), and authentic assessment (Bartlett, 2002; Gatlin & Jacob, 2002; Kariuki & Turner, 2001; Norton-Meier, 2003). Reports on how in-service (i.e., practicing classroom teachers) used electronic portfolio to integrate technology into curriculum have been scanty. The objective of this paper is to examine how electronic portfolio can be used as an effective method to integrate technology into K-12 curriculum for in-service teachers. This paper describes and analyzes the process of creating standards-based electronic portfolio to support in-service teachers' professional development.

While statistics have shown that 98% of public schools have Internet access and the K-12 schools are better equipped with computer hardware and software (Advanced Learning Technologies, 2002), the demand for teacher training in technology integration into curriculum has also increased. Although many pre-service and in-service teachers have received skill training in using technology, the majority feels ill-prepared to integrate technology into teaching (National Center for Education Statistics, 2001). This article contributes to the field of technology integration in the following ways by (1) transforming electronic portfolios from a digital scrapbook to a purposeful collection of professional work and development in one or more areas over time, 2) analyzing and discussing the pros and cons of using standards-based e-folio for in-service teachers, and 3) providing recommendations for effective ways of e-folio building for K-12 educators.

Literature Review

Portfolios are developed for a range of purposes: learning, teaching, assessment, appraisal, promotion and professional development (Klenowski, 2002). In-service teachers can select artifacts created in professional development workshops or classes to support learning and teaching activities in the classroom. These artifacts collected in the portfolio provide evidence for careful evaluation of teaching and learning practices. As the portfolio continues to evolve, a portfolio can be used to
demonstrate a teacher’s competency in integrating technology into a content area. Kilbane and Milman (2003) categorized portfolios into two groups: professional portfolios and teaching portfolios. Professional portfolios include working portfolio and presentation portfolios. Working portfolios cover all the work that a teacher has developed over a period of time, for example, lesson plans, photographs, email communication with students and parents, multimedia presentation, and so on. A presentation portfolio is also a “showcase portfolio that represents a subset of materials found in a professional’s working portfolio” (Kilbane & Milman, 2003, p. 5). The materials are carefully presented and reflected upon to address a specific standard or goal.

Teaching portfolios are typically used to demonstrate “the professional competence of anyone who engages in the act of teaching at any academic level” (Kilbane & Milman, 2003, p. 7). A teaching portfolio is a type of presentation portfolio and very popular at the K-12 system. Many national organizations promote the use of teaching portfolios as a way of authentic assessment to evaluate if a teacher has fulfilled the course objectives and learned the knowledge and skills to function in the real world. The National Board for Professional Teaching Standards (NBPTS) and the Interstate New Teachers Assessment Support Consortium (INTASC) are two organizations that recommend the use of teaching portfolios to demonstrate a teacher’s competency and professionalism.

With the popular acceptance of the World Wide Web and computer technology, an increasing number of educators are moving toward the creation of digital teaching portfolios, which are also referred as “multimedia portfolios, electronic portfolios, e-folios, webfolios” (Kilbane & Milman, 2003, p. 7). Campbell, Cignetti, Melenyzer, Nettles and Wyman (2004) pointed out that the advantages of an electronic portfolio include the following: demonstrate technology knowledge and skills, facilitate distribution, store many documents, and increase accessibility. With the creation of digital teaching portfolio, teachers can not only showcase the best work as a professional but also exhibit the knowledge and skills in using technology. Other advantages of digital teaching portfolios include; accessibility, portability, creativity, technology, self-confidence, and community building (Kilbane & Milman, 2003, p. 8-9). Digital teaching portfolios can be burned on CD or published on the Web for public access. When the delivery medium is transformed from paper to information communication technology (ICT), it allows more varieties and creativity in producing the artifacts. With the increasing comfort in using digital media to create teaching portfolios, the teachers can also develop a sense of confidence in using technology. Through the World Wide Web, teachers share materials with students, parents, administrators, and fellow teachers in the same discipline. The information sharing and communication help to foster a sense of community.

Background

The eFolio projects described in this paper are from the Learning Technology (LT) graduate program in the School of Education between 2003 and 2004. The goal of the program is to develop technology-savvy teachers who will be role models for others in infusing technology into K-12 environments. The Learning Technology Certificate Program is a series of well-designed, technology-intensive graduate level classes for in-service teachers. The certificate program can also be part of a Masters degree program in the Department of Curriculum and Instruction at the School of Education. The program introduces a variety of cognitive leaning theories as the foundation for developing effective instructional strategies for adapting various cutting-edge learning technologies, including desktop publishing, presentation tools, web development, digital media, and video production. This program addresses the International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS) for Teachers and Students (http://cnets.iste.org/). The six standards for teachers are:

1. Technology operations and concepts
2. Planning and designing learning environments and experiences.
3. Teaching, learning, and the curriculum
4. Assessment and evaluation
5. Productivity and professional practice
More detailed descriptions can be found at the ISTE web site. Each course at the LT program addresses at least two or three NETS standards so that the graduates of the program would be able to demonstrate competency in technology.

The constructivist model of technology integration (Roblyer, 2003) serves as the underpinning theoretical framework for the design of the graduate teacher education program. Technology integration must move beyond training for using computer applications or using computers as an add-on in the classroom. Technology integration should be part of the curriculum to foster collaboration, transfer knowledge, and create a learner-centered learning environment. In addition, teachers need to show competency in using technology based on the ISTE technology standards. Participants of the program are mainly K-12 in-service teachers with a few exceptions who work in or are in the process of making transition to technology-related positions.

**eFolio for Technology Integration**

All Minnesota residents have access to an electronic portfolio authoring system titled “eFolio Minnesota.” The “eFolio Minnesota” project was an initiative by the Minnesota State Colleges and University System (MNSCU) to provide a free web-based portfolio for all Minnesota educators, students and workers. The eFolio serves the purpose of online resume, storage, and display of education, training, and career related data. It enables educators to showcase their technology projects and to highlight their professional development. The web site can be viewed at http://www.efoliomn.com/. Users of eFolio can customize the design of their homepage, upload documents and audio/video media files, provide hyperlinks to external or internal documents, conduct survey and submit feedback through online form. Users can enter content using skills similar to Word Processing without knowing HTML. Online wizard is available to provide information on how to use the built-in tools in eFolio.

Using eFolio for technology integration is implemented in two stages: technology introduction and technology integration. At the initial technology introduction stage, eFolio was used mainly as a presentation portfolio to showcase all technology projects developed through the Learning Technology program. Most participants have done very little with technology in the pedagogical applications of technology to enhance teaching and learning activities. Through the coursework, the in-service teachers developed several technology projects that could be applied to the classroom or school settings. The basic template for an eFolio includes, but is not limited to, teaching philosophy, CV or resume, and the technology showcase sections. The six ISTE NETS for teacher are embedded in some of the projects. For example, a Web-based lesson plan will include the curriculum or technology standards that this lesson demonstrated in the teacher section without reflection or further elaboration on the technology integration process. It wasn’t until the second stage, the technology standards were added to the portfolio as a new sub-section. The students have to provide artifacts and reflections that demonstrate how this artifact addresses a particular standard.

**Stage One: Technology Introduction**

The in-service teachers use eFolio primary for three purposes: (1) demonstrate tech competency as outlined by ISTE NETS, (2) communicate with students and parents, and (3) provide web-based learning materials for easy access and instructional activities. The K-12 in-service teachers attending the Learning Technology program used eFolio as the portal to put together the best of their technology projects and lesson plans. In order to provide a better understanding of the NETS standards, the participants in the program worked in groups to analyze the NETS standards and review the lesson plan databases on the Web that addresses each of the technology standards. At the end of the exercise, the students have to report to the whole group how the lesson plans addressed the technology standards. Subsequently, they were able to address these standards in their own
technology projects. During the regular semester, they have also engaged in Web-based bulletin board discussion to provide feedback at each other’s technology projects.

At this stage, the participants learned the basic functions of eFolio and provide links to their technology projects that were created for class projects or school functions. In the meantime, the participants might be exposed to, for the first time, PowerPoint, Inspiration, and web site construction. For most in-service teachers, it was exciting to be able to provide links through eFolio to these projects to show their students, parents, and fellow teachers.

**Stage Two: Standards-Based eFolio**

One may find different degrees of technical competency in the eFolio projects because they are at different stages of developing the portfolio through the LT program. One aspect that the LT program emphasizes is the alignment with the ISTE standards. All tech projects need to address the technology standards. At this stage, the presentation portfolio was expanded into a digital teaching portfolio. The in-service teachers presented at least one artifact for each standard and provided a reflection on why or how they have chosen a particular artifact to address the related standard. The artifacts refer to the integrated technology projects such as video production, slideshow, inspiration lesson plan, and WebQuest. The K-12 teachers continue to add artifacts to their eFolio sites as they complete the technology courses at the graduate school. A few samples of the integrated projects can be found at the following web sites:

http://courseweb.stthomas.edu/ccchou/528/MFTportfolioWQ.html,
http://courseweb.stthomas.edu/ccchou/528/projects.html

**Reflection**

When the author started using eFolio as a tool for teaching technology integration, the eFolio system was treated as a depository for showcasing K-12 teachers’ projects from the technology courses. As Barrett (2001) has recommended that this kind of electronic portfolio is no different from a digital scrapbook. At the initial stage, the K-12 in-service teachers were amazed at how easy it was to create personal eFolio and to engage their students in computer-based activities. They have also expressed frustrations when using more advanced features to manage their portfolios. The majority of teachers would like to have more time to master the authoring system and develop a comprehensive teaching portfolio. Most of the teachers have expressed interests in using eFolios for their professional growth and instructional activities.

On the aspect of technology integration using standards-based eFolio, the web-based authoring system should definitely be an integral part of a technology curriculum, not a stand-alone unit. All course objectives should match with ISTE NETS. In other words, develop a matrix of the course objectives and the corresponding ISTE standards. In-service teachers may be motivated to use the system but do not have the momentum to carry it through because of a busy teaching schedule. However, as an integral part of a technology curriculum, they will have a more systematic ways of demonstrating competency in all six standards. Technology integration does not mean using technology in the classroom. The processes include the development, implementation, and reflection. eFolio provides the venue for this practice that is so relevant to an educator’s teaching and learning activities.

Based on the instructor’s observation and interviews of students, the pros and cons of using eFolio can be summarized as follow:
Pros

- Increased communication with parents, students, and administrators
- Engage student learning through web-based activities and resources
- Allow the upload of video, audio, and documents for a multimedia presentation
- Authentic assessment of the in-service teachers’ technology competency based on ISTE standards. Visitors of the eFolio sites can have a quick overview of what an in-service has accomplished and the scope of the projects.

Cons

- Novice teachers of technology may find it challenging to find appropriate examples to address the standards as they strive to learn the new technology and new standards at the same time.
- Limited Web server space (3 MB max) can restrict the types of multimedia projects shown in eFolio. More server space can be purchased.
- The types of text documents that can be uploaded to the eFolio authoring system are limited to HTML, PDF and Word documents. A plain web page without graphics is acceptable. A web page with graphics will show a broken link at the graphic link even if the graphic is uploaded.
- Text editing/formatting features are not available on a Mac.

The students have also responded to an end-of-course anonymous survey to reflect upon the process of using eFolio. When asked about the usefulness of eFolio for K-12 educators, 28% found it extremely useful, 50% found it very useful, and 22% thought that it could be useful. Interestingly, when asked about how useful is eFolio for their profession, 33% found it extremely useful, 39% found it very useful, and 28% thought that it could be useful. When asked about if they would continue to develop eFolio after the completion of the coursework, 78% said “yes” and 22% said “maybe. Here are the questions and highlights of the feedback from the survey:

Question 1: What do you see as the advantage of creating eFolio?

- “An eFolio is a professional technological tool to utilize in our teaching career. This allows our resume and activities available to a large source of people!”
- “I think this is a great way to organize my resume, classes, and professional growth and development. This is something that I have been meaning to organize, but never got around to doing. The eFolio is a great way to share class information to my students.”
- “It provides you with an opportunity to evaluate where you are at personally and professionally. To become a resource, share your expertise with others. It motivates you to grow professionally.”
- “E-Folio's advantages are numerous - to provide a site that gives an educator's background and philosophy as well as displaying the technology projects developed within the cohort classes. By being able to see other students' efolios, I was motivated to do more!”
- “The eFolio allows students to have an ongoing project so they can continue to update their work, show their progress to peers or possible employers, and interact with the material. I would probably not upload my projects that I completed in class unless I had a reason to have them online. The eFolio gives me that reason.”
- “The E-Folio was personally and professionally enriching! I feel it is a valuable tool that collaborates experiences, knowledge and philosophies in one's profession. The ongoing nature of the program is a positive attribute! The entire learning process was one of growth and I feel proficient with the overall format and use of the E-Folio. The E-Folio is a wonderful tool for sharing professional accomplishments in the search for a new position or career due to it's multimedia capabilities. It definitely paints a more attractive and visual picture than a hard-copied resume.”
- “Our college is thinking about expanding our website. I think e-folio would be an asset to our college website.”

Question 2: What do you see as the disadvantages of creating E-Folio?

- “I do not see any disadvantages.”
Basically the time it takes to develop the original eFolio and making sure we keep it up-to-date.

“The only disadvantage I can see is that it can be viewed by anyone who has my eFolio address and it exposes a lot of information on myself.”

“The program is somewhat limiting. I created a lot of my eFolio in HTML and copied and pasted it. I also linked most of my projects to another site where they were stored. I also wish an index or way to search other users' sites. I like looking for new ideas and styles of pages.”

“I am so computer naive I don't feel my eFolio is as professional as others.”

“Finding the time to continue to update.”

Question 3: How could the E-Folio assignment have been more effective than it was?

“I learned a lot about eFolio and I don't see anything that would have made it more effective. The only thing I can think of is that we could have had more time to develop it.”

“It would be interesting to discuss the appropriate way to use it for employment purposes.”

“I would have liked to set up the eFolio as my professional page, and then also focused in class on making a teacher page. A page for students to link off of, for me to post assignments, etc.”

Question 4: How do you plan to use E-Folio in the future?

“For future employment and for verification of professional development.”

“I plan to keep it updated and to provide my address to administrators and peer teachers.”

“I plan to update my E-Folio on a regular basis. I also plan to have my students develop their own E-folio next fall. I'm extremely excited about this project. Thank-you.”

“It’s an ongoing collaboration of works! The usefulness of the E-Folio is lifelong and ever-changing!”

“I have shared the site with many teachers already. I may use it with students, but will probably have them use the concepts I learned making the page to create their own pages on the district server.”

“With parents and colleagues”

Recommendations

eFolio has only been integrated into the Learning Technology Program for less than one year since its inception to the Minnesota. It has great potentials to excel teacher's tech skills and promote ideas on technology integration. As the instructor try to come up with a better way of integrating technology into the teaching and learning practices, the following steps are recommended to make the system a more integral part of the curriculum:

1. Use a Web-based discussion board to allow the fellow teachers to comment at each other’s eFolio sites
2. Set aside at least two or three class sessions to review ISTE NETS standards and the appropriate examples that address these standards
3. Build a database of standards-based eFolios developed by the in-service teachers by grade levels and content areas
4. Develop a more comprehensive rubric for evaluating eFolio projects. A checklist on the basic elements is currently used. Although the checklist is useful in making sure all sections are completed as required, the list does not reveal the quality of the technology integration projects. All artifacts linked to the eFolio are evaluated separately with a set of different rubrics. Nevertheless, a holistic rubric should be developed to provide better assessment on a teacher's technology competency.
5. Each subsequent technology course should set aside at least one session to review the functions of eFolio and provide links to new artifacts that address the ISTE standards. Some participants tend to forget the basic functions and review sessions are always helpful.
6. Put multimedia projects that require a large server space at a third server and provide links to eFolio.
Conclusion

eFolio is not used merely for the purpose of technology skill development but a way to incorporate technology into classroom. By employing ISTE standards, the in-service teachers can follow the performance indicators within a prescribed framework to evaluate their own work and to assess their technical growth. With this framework, it also makes the evaluation of the projects easier.

The author believes that electronic portfolio will continue to be the important tool for authentic learning and assessment. With the institutional and State’s support in using eFolio, educators are more willing and encouraged to adapt to the portfolio authoring system. The incorporation of the NETS standards also makes the content of the eFolio more meaningful. Prior to the introduction of eFolio to the graduate students at the Learning Technology program, students used generic off-the-shelf software such as FrontPage or Dreamweaver to create tech projects. After the students are introduced to eFolio, they learn to use both the electronic portfolio managing system and generic Web editor. The contents of the projects are richer and the presentations are much better organized.

Reference List


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