

Electronic Portfolio System Development: From Pilot Testing to Implementation

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Abstract

Educational agencies in the United States are calling for increased accountability in teacher preparation programs, demanding standards of performance and allocating funds to assist students and teachers to meet those standards. Using new teaching and learning technologies, some schools of education are beginning to implement electronic portfolios as a means to document the meeting of standards and present evidence of quality. By using a common scoring guide, faculty and program administrators are able to evaluate the performance of individual students and programs as a whole. This study analyzes the pilot testing and implementation phases of the electronic portfolio (eFolio) system developed by Florida International University. Data gathered during this period has been analyzed by document analysis of email correspondences between the students/faculty and the development team, and observations made during pilot testing. Various technical and developmental issues identified in this process have been discussed.

Keywords: teacher education, electronic portfolio, pilot testing, implementation, student performance tracking

Electronic Portfolio System Development: From Pilot Testing to Implementation

Public agencies in the United States are calling for increased accountability in all aspects of teacher preparation programs, demanding standards of performance and allocating funds to assist students and teachers to meet those standards. In 1997, the National Council for Accreditation of Teacher Education (NCATE) concluded that a majority of teacher education programs were not accomplishing the standards that they needed to achieve in terms of preparing teachers for the 21st century classrooms. NCATE recommended technology education as a key to the teacher preparation process. Aligned with the Interstate New Teacher Assessment and Support Consortium (INTASC), NCATE standards require teacher candidates to be able to appropriately and effectively integrate technology to support their learning. One of the particularly relevant NCATE recommendations is that teacher education programs post student portfolios for electronic review (Waugh, Levin, & Buell, 1999).

For some time now, portfolios have been recognized as a means to document the meeting of standards and present evidence of quality. Evaluation of portfolios is one of the ways to assess performance on a continuous basis. Requiring teacher education students to create and maintain paper portfolios may be inconvenient for faculty in terms of storage space and program administrators in terms of the absence of a common platform for evaluating the quality of programs. With the recent influx of new teaching and learning technologies, schools of education are beginning to implement electronic portfolios. An electronic portfolio is a purposeful collection of student work captured by electronic means, and is an exhibit of individual efforts, progress and achievements in one or more areas (Wiedmer, 1998). By using a common scoring guide, faculty and

program administrators are able to evaluate the performance of individual students and programs as a whole systematically and reliably (Goldsby & Fazal, 2001). The purpose of this paper is to analyze the developmental phase between pilot testing and implementation of the electronic portfolio system developed and maintained by Florida International University.

The literature in the field of electronic portfolios shows that not much work has been done to measure program effectiveness in schools of education across the United States using this means. However, numerous advantages related to the use of electronic portfolios are suggested in the literature. According to Wright, Stallworth and Ray (2002), electronic portfolios promote learner self-evaluation even as they maximize the use of diverse learning strategies. Herman and Morrell (1999) argued that electronic portfolios shift the balance from teacher-centered learning to student-centered learning. In response to NCATE requirements, teacher education programs at the University of Illinois are using an electronic web-based system that provides students access to their records and an easy means of submitting evidence in support of their attainment of required skills and experience (Waugh, Levin, & Buell, 1999). However, this system does not allow faculty and program administrators to evaluate the portfolios and assess program effectiveness in a timely and efficient manner. As a part of the design for program improvement, the College of Education at the University of Houston has an action plan for students to compile and maintain electronic portfolios throughout their pre-service experience. According to Pierson & McNeil (2000), students will graduate with a tangible record of their experiences and a better understanding of their own abilities. However, it is not clear how effective this system is in assessing program

effectiveness and measuring students' achievements. In the teacher education program at the Iona College, faculty evaluate student portfolios online with the help of a uniform rubric that allows an objective, systematic and reliable evaluation of student achievement (Goldsby & Fazal, 2001). At Georgia State University, pre-service students are assessed through a portfolio development process with benchmarks throughout the program. The INTASC principles are aligned with the program's schedule of courses to establish which principles the students would be able to address at set intervals. These intervals serve as benchmarks to assess the students' portfolios (Schoffner, Dias, & Thomas, 2001).

How the eFolio System Works

The electronic portfolio (eFolio) system at Florida International University is a web-based application with a database at the backend that enables the tracking of individual student's performance and also every teacher education program's effectiveness based on the standards set by the Florida Department of Education. It is a key component of the College of Education's continuous improvement plan to develop the system not only for NCATE requirements but also to monitor the performance of programs. It is the primary college-wide mechanism for documenting and tracking candidate mastery of Florida state standards that are called the Florida Educator Accomplished Practices or FEAP's. Each initial teacher preparation program in the college of education has aligned its courses to meet each of the FEAP's at least twice before student teaching and once during student teaching. Every program has identified certain performance tasks to demonstrate the accomplishment of one or more FEAP's and the end-product of performing these tasks are known as artifacts. Rubrics have been developed to evaluate these artifacts in a uniform way regardless of which faculty

member is teaching the course. As the student goes through the program, these artifacts are required to be posted by the students to the system. Students who have performed satisfactorily in the task are the ones who are authorized by the respective faculty to post their artifacts to the system. Student records are kept in the database and their artifacts are stored in their own folders on the college's web server. A FEAP transcript is generated for each student that allows the student, his/her advisor and the internship coordinator in the college to determine whether the student has met all the requirements prior to internship. Faculty and program administrators at anytime can view the status of a particular student, a particular course or a particular program in terms of the extent of meeting the standards. Student artifacts posted to the system serve as reliable data that influence program planning, assessment and program accreditation.

Besides measuring program effectiveness, the eFolio system enhances student performance by providing every student with the opportunity to create and maintain an online web-based portfolio that can be used as a showcase of his/her skills and expertise for future employers. Technology, which is the backbone of this system, has been instrumental in making the system extremely user-friendly and easy to navigate. The web interface and the maintenance of records in the database allows for reports to be generated based on a variety of parameters to present evidence of quality of any program.

The eFolio system was launched in its first phase in fall 2003 after the successful completion of a pilot test in spring 2003. The first phase involved the implementation of this system for five initial teacher preparation programs that make up the largest proportion of the student population in the college. These programs are Elementary Education, Special Education, Physical Education, English Education, and Social Studies

Education. This paper addresses the issues of launching an electronic system that is a part of a performance-based teacher preparation program.

Method

Eighty-eight students from three classes participated in the pilot testing phase at the end of the spring 2003. Data during this phase was collected primarily from observing students upload their artifacts in a lab setting after they got trained in the eFolio system, and emails sent to the system administrator by students and faculty if the uploading was done from somewhere other than the lab. In the implementation phase beginning in the fall 2003, 1209 students and 61 faculty members participated. Emails sent to the system administrator during this phase were used exclusively for analysis. Emails from the pilot testing and implementation phases were copied and pasted into a single document. This document was then printed. Thematic coding was done where we kept tallies on each theme. Each tally was called an event. Some emails had multiple themes.

Findings

Table 1 summarizes the themes from the emails sent to the system administrator during the pilot testing phase. These themes were logging into the system, re-uploading of artifacts, not following uploading protocol, viewing student course artifacts, lack of basic computer skills, insufficient information provided, source data issue, programming inefficiency, using incompatible software, and viewing curriculum matrix and FEAP's. Of these themes the source data issue and the programming inefficiency were items that had to be revisited by the programmers. The data showed that the programming inefficiency category was the single largest category generating 33 events. The nature of

this programming inefficiency had to do with the coding of the page that handled the uploading of the artifacts. During development, the code was found good enough to upload files because the test files were not too big in size and the connection speed at the development site was excellent. Due to a lack of faculty input during development, it was impossible to know the possible file sizes that might result from actual artifacts. The source data issue pertained to not having the correct student data in the system. This was a result of a miscommunication that occurred between one faculty member and the development team. Emails that generated the themes of logging into the system, re-uploading of artifacts, not following uploading protocol, viewing student course artifacts, and viewing curriculum matrix and FEAP's were generally emails that pertained to how the users interacted with the system. While the lack of basic computer skills and the using incompatible software themes had few events, they alerted the development team to potential issues on a larger scale during the implementation phase.

Table 1
Pilot Testing Themes Found in Emails

Themes	Events
Logging into the system	1
Re-uploading of artifacts	3
Not following uploading protocol	1
Viewing student course artifacts	6
Lack of basic computer skills	2
Insufficient information provided	1
Source data issues	1
Programming inefficiency	33
Using incompatible software	1
Viewing curriculum matrix and FEAP's	1

The observations results are provided in Table 2. They were lack of communication, using incompatible software, lack of basic computer skills, programming inefficiency, user friendliness issue, and source data issues. Here too the programming inefficiency's theme figured prominently followed closely by lack of basic computer skills and lack of communication. This programming inefficiency is the same one that was identified while analyzing the emails. Some students lacked the skills of using scanners. Inter-operability between different software applications was also an issue for some. The lack of communication theme stems from some students not being informed that they were required to bring their artifacts in a disc to the lab while some were not aware that it was mandatory for them to upload artifacts.

Table 2
Observations During Pilot Testing

Themes	Events
Lack of communication	4
Using incompatible software	2
Lack of basic computer skills	5
Programming inefficiency	6
User friendliness issues	2
Source data issues	1

In fall 2003 the eFolio system was launched. The results of the themes garnered from the emails sent to the system administrator during this period are shown in Table 3. The major themes in this phase were logging into the system, re-uploading of artifacts, not following uploading protocol, insufficient information provided, source data issues, and viewing curriculum matrix and FEAP's. Since it is the university's policy that students use their university email addresses, the eFolio system required the students to

have their usernames as their university email addresses by default. However, many students do not use the university's student email system and are not even aware of their student email addresses. This resulted in them having logging in problems. Re-uploading was necessary for many students because they had failed to pay attention to details and uploaded the wrong version of the artifact into the system. Since the system allows the student to upload an artifact only once, the re-uploading process involved the student sending an email to the system administrator by providing the specific course number and the faculty member's name. The system administrator would then confirm with the faculty member and then remove the incorrect version of the artifact from the system, so that the student could re-upload. Some students did not follow the necessary steps to upload the artifacts and that generated the emails asking for uploading support. The theme of insufficient information evolved from the emails that did not contain enough information for the system administrator to assist the students. In the source data that was used to populate the system database, there were some discrepancies in the class roster, like incorrect number of students or incorrect student usernames. This prompted some faculty members and students to email the system administrator. The theme of viewing the curriculum matrix and the FEAP's resulted from some students and faculty members not understanding how to navigate through the site in order to view the tasks and rubrics of the courses. This event occurred even though online manuals for students and faculty were developed and training was provided to faculty all through the semester. Training was never provided to students because of their sheer numbers. However, handouts were provided to them in class and assistance was available to them at the computer labs.

Table 3
Themes Found in Emails During the Implementation Phase

Themes	Events
Logging into the system	51
Re-uploading of artifacts	66
Slow Internet connection/file size	9
Not following uploading protocol	19
Students not authorized by faculty	3
Viewing student course artifacts	7
Lack of basic computer skills	2
Insufficient information provided	28
Source data issues	17
Viewing class artifacts by faculty	1
Programming inefficiency	4
Using incompatible software	4
Master's student from cross-listed course	3
Registering for faculty training	4
Not finding old artifact from pilot-testing	2
Lower division student	2
Viewing curriculum matrix and FEAP's	15

Conclusion

The eFolio system is expected to be instrumental in collecting and maintaining data in a reliable way so that program effectiveness can be measured. As a key component of the college's continuous improvement process, the system is expected to help in program planning, assessment and accreditation. Though the literature indicates the existence of a few portfolio-based assessment systems, the eFolio system is unique in the way it is designed in two ways: a) to measure program effectiveness vis-à-vis state mandated standards b) serve as a vehicle for students to host their portfolios online. With

calls of accountability coming from all quarters, presenting evidence of quality for teacher preparation programs seems here to stay. With the implementation of national standards addressing technology, teacher preparation programs at Florida International University would benefit from implementing the eFolio system to introduce students to teaching and learning skills for the future classrooms and enable administrators and faculty to measure program impact. The lessons learnt from the pilot testing and the initial implementation will undoubtedly help in refining the eFolio system. The pilot testing of the system was a useful strategy to adopt because it pointed out some of the issues that were subsequently taken care of in the summer so that the system was ready for the implementation stage. The system will incorporate the rest of the initial teacher preparation programs in the college in fall 2004. The success of the eFolio system at Florida International University will serve as a model for other colleges of education throughout the United States to realize the importance of developing evidence-based assessments that clearly demonstrate program effectiveness and help in efficient program planning and continuous improvement.

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