## Electronic Assessment Systems: Implementation, Maintenance and Support

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#### ABSTRACT

This study focused on the processes utilized by three institutions implementing, maintaining, and supporting electronic assessment systems. Each university experience was described as a case study. Each university took a very different approach toward implementation of their system, but they had similar experiences. It became clear that administrative support is very important in terms of implementing a new electronic portfolio system. The dean must be supportive of the initiative in terms of financial, personnel, and moral support for faculty buy-in. Faculty members are responsible for submission of key assignments; their cooperation is necessary for getting artifacts uploaded to the electronic portfolio system. Another key component in having a successful implementation is to implement in phases. As noted in all three programs, it is important to have a blue print of how the electronic portfolio system should work and function. All three institutions have designated someone, either faculty member or administrator, to maintain the system to ensure the updates are successful. To run an effective electronic portfolio system that is user friendly and provides the required data for accreditation purposes, the system must be regularly updated. The institutions provided multiple forms of support for both teacher

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# education candidates and faculty. All provided a lab with support for teacher education candidates and faculty, as well as online support.

Teacher education programs, in an effort to use data to make programmatic changes or for accreditation purposes, have begun using electronic assessment systems. Electronic assessment systems allow the administrators of teacher preparation programs to collect, aggregate, summarize, and disaggregate data. Analysis of these data provides faculty, program chairs and administrators key pieces of information necessary to continually improve courses, programs, and units.

A driving force behind the adoption of electronic assessment systems is the accreditation process. Teacher education programs that seek accreditation from specialized professional associations (SPAs) such as National Science Teachers Association (NSTA) and National Council of Teachers of Mathematics (NCTM) are required to use data to make programmatic changes. Programs must collect data on a regular basis in an efficient and reliable manner, and document changes made based upon the data. Additionally the National Council for Accreditation of Teacher Education (NCATE) requires teacher education programs to have an assessment system that collects and analyzes data regarding teacher education candidates (NCATE, 2008).

Financial and human resources play a major role in the design, implementation, maintenance and support of an electronic assessment system. In the design stage institutions have a major decision to make in terms of whether they will build their own inhouse system, use a commercial system, or develop a hybrid system (use of both an inhouse and commercial system). Institutions with the budget to hire a programmer and personnel to design an electronic assessment system have the option to build a system customized to the institution's individual needs. Institutions with financial restrictions usually use commercial systems in which the cost is either absorbed by the institution or passed onto the students. One limitation of a commercial system is that customization for an exact fit of the assessment system can be difficult.

Barrett (2004) lists a variety of features that are key components of an electronic assessment system. According to Barrett, the main purpose of an electronic assessment system is to collect qualitative and quantitative data for the institution. This data set is composed of student submitted work (once it has been graded by faculty), standardized test scores, course exam scores, and other documentation required to demonstrate meeting of state and national standards. Usually, the data are stored online, and the system uses a relational database to record and store the data. A disadvantage of using an electronic assessment system is that student customization options for designing portfolios for course work or employment purposes are limited. Commercial systems usually come with design templates similar to Microsoft PowerPoint design templates. An advantage of using a commercial system to design digital portfolios is that electronic portfolio systems require only minimal technology skills (Barrett, 2004).

Saint Leo University in Florida implemented an electronic assessment system called the Individual Accomplished Practices Assessment System (IAPAS) as a way to meet state expectations for teacher education programs; it is used in undergraduate and graduate programs. IAPAS requires students to upload course-embedded assessments, which are aligned with standards in the online system. The faculty members then grade the student submitted assignment using a standard rubric and enter the score onto the online system (Swade, Parrish, & Walker, 2009).

In a study regarding implementation and use of the IAPAS conducted by Swade, Parrish, and Walker (2009), researchers found that to implement an electronic assessment system, support and guidance by university administration is the first step. Administrative support during the implementation phase allowed the institution to overcome any barriers, foreseen and/or unforeseen. Secondly, various stakeholders (full time faculty, adjunct faculty, and students) do not all have the necessary technology skill to use the system; thus, training was required before and during implementation of the system. Third, the student requirement to pay for the system was met with resistance, and there was no real solution other than that they had to pay. Finally minor issues, in terms of grading and encouraging faculty to grade on time, existed and were dealt on an individual basis.

When asked what the purpose of the IAPAS both student and faculty indicated that it was to document state required standards. Both faculty and students indicated that using the system would not improve their teaching/learning. In terms of using the system both student and faculty stated that they spent on an average, less than an hour either submitting assignment or grading per week. There was a significant number of both students and faculty who indicated that they spent on average between 1 to 2 hours. Additionally students and faculty stated they had a hard time uploading and grading assignments online (Swade, Parrish, & Walker, 2009). Conclusions of the IAPAS study were that student and faculty understood the purpose of the IAPAS. Additional training was necessary for both faculty and students to make the system more use friendly and efficient.

Determining whether to have a commercial, hybrid, or in-house system is the first big decision. Once an institution has chosen the type of system to use, the next step is to determine how to implement, maintain, and support the system. Some institutions have assigned personnel such as assessment coordinator, data coordinator, and administrators (such as assistant or associate deans) in charge of assessment and accreditation to help implement, maintain and support the electronic assessment systems. Universities have also set up labs, online and phone help desks, and other resources to help both faculty and students use the electronic assessment system. This study focused on the processes utilized by three institutions implementing, maintaining, and supporting electronic assessment systems.

#### Methodology

A case study methodology was utilized for this study. Yin (1994) suggested that case study is the appropriate methodology to use when one is answering questions such as "how" or "why," when the investigator has little control over variables, and when the phenomenon is to be studied is in real life context. The current study meets these criteria.

The University of Tennessee, the University of Louisiana Monroe, and the University of Wisconsin Whitewater participated in this study. Each case of implementation, maintenance and support of the electronic assessment system was described. The cases particularly addressed when the system was adopted, whether the implementation timelines were met, procedures for implementation, barriers to implementation, faculty and student responses, faculty and student training issues, student use of the electronic system, technical support, and how data are used.

#### **Case 1: The University of Tennessee**

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The University of Tennessee uses a hybrid system where one part is built in-house and the other is a commercial system called the Personal Learning Portfolio or *PLP*. The University of Tennessee's College of Education, Health and Human Sciences uses its system in the undergraduate and graduate (MS, Ed.S and Ph.D.) programs. Approximately 500 teacher education candidates are enrolled in these programs.

**Implementation phase.** During the implementation phase of the electronic portfolio system, the University of Tennessee formed an assessment committee to oversee the development process. Representatives of the committee included key constituencies related to initial and advanced licensure programs. Faculty developed key assessments and rubrics which were mapped to standards and shared with stakeholders. Assessments and rubrics were piloted and then revised based on data (rubric scores, faculty feedback) and vetted through the assessment committee. The electronic portfolio system was implemented first in the initial programs then the graduate programs. Once the systems were in place, faculty and teacher education candidate training was held both in groups and individual sessions.

At first, some faculty members of the University of Tennessee were resistant to using the *PLP* electronic portfolio system. Not only did they use *Blackboard* for classes but they would also have to use another electronic platform to grade certain assignments for their students. Using two platforms was seen as another demand on their time. Once training was completed faculty had a better understanding of the system and how it works the initial resistance disappeared.

Another barrier to the development and implementation of the system was that the in-house database was not always a high priority for the university programmers. Development and updates were done as time allowed. Consequently development and deployment took longer than anticipated.

**Maintenance Phase.** At the University of Tennessee the data coordinator is in charge of maintenance for both the *PLP* and in-house data base system. A university level programmer was assigned to work on the in house database system as time permitted. The coordinator and programmer ensure the daily functionality of both systems.

One of the challenges in maintaining the system includes the setup and maintenance of accounts which has to be done manually. Sections are set up in the portfolio system at the beginning of each semester. Advising assignments are based on class rolls. As a result a graduate assistant is assigned to help with the setup and maintenance of accounts. Changes or updates to programming of the in-house portion of the system can take some time depending on the programmer's workload. An additional issue related to the commercial portion of the system is the cost involved. Currently the University pays for student accounts; however budget limitations may at some point require that the cost be passed onto the teacher education candidates. **Support Phase.** The University of Tennessee's TecLab is used as a primary area for group training sessions for teacher education candidates. In addition to group training, individual training sessions can be setup with the Data Coordinator. E-mail and phone support is also available for both faculty and teacher education candidates. In an added effort to support faculty and students, online manuals were created and deployed.

Because training sessions are not mandatory for teacher education candidates not all of them attend the workshops. Those candidates who do not attend the workshops, at times, struggle to use the electronic portfolio system, and find they need to meet one-on-one with the data coordinator for help. Another support issue is that class rolls change. Students dropping and adding creates a problem in terms of the posting and evaluation of key assessments because course sections and advising assignments must be updated to reflect changes.

#### **Case 2: The University of Louisiana Monroe**

The University of Louisiana Monroe uses a commercial system called *TaskStream* (https://www.taskstream.com/pub/) as its electronic assessment system for both the undergraduate and graduate (including, M.A.T, M.Ed. and Ed.D.) programs. Approximately 400 students are enrolled in both the undergraduate and graduate teacher education program.

**Implementation phase.** At the University of Louisiana Monroe, assessment portals (transition points) were set up for teacher education candidates; when the education candidates pass through the portals a team reviews the portfolios. Faculty created the course assessment descriptions and rubrics that were part of each of the portals. Also during implementation a coordinator of field experience created field experience requirements and appropriate forms. All key assessments, field experience requirements, and other assessments were reviewed by program faculty and then by the assessment committee before being implemented. In addition to the aforementioned preparations, faculty had a one hour workshop on how to use *Taskstream*, while teacher education candidates were trained as cohorts whenever possible or were instructed to attend workshops at set times during the week.

Due to various requirements all implementation and training had to occur within two month period of time, which created a tremendous burden on the implementation training team. In part due to the short implementation time, both faculty and teacher education candidates experienced stress and anxiety. A final burden for implementation was financial—with previous versions of the electronic portfolio systems utilized by the university, the candidates did not have to pay, but with the new system the costs were transferred to students, which created dissatisfaction.

**Maintenance Phase.** The Assistant Dean of Assessment and Evaluation maintains the electronic portfolio in terms of design and the Director of Research and Data is in charge of aggregation of data. In addition to the design and data maintenance, student workers in the Digital Media Studio, a multimedia lab setup to facilitate the creation of artifacts for the electronic portfolio, help both faculty and candidates in using *Taskstream* on a one-on-one basis and in group workshops. Because of the lack of human resources and the continuous changes to standards and key assessments, maintenance of the assessment

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system is a logistical and time issue for both the Assistant Dean of Assessment and Accreditation and the Director of Data and Research.

**Support Phase.** The Digital Media Studio was created with the sole purpose of helping faculty and teacher education candidates with the electronic portfolio system and the creation of artifacts that feed into the system. Student workers who know how to use the system and other technology tools, such as video cameras and video editing software to help students create artifacts, work in the studio. Additionally an E-Help desk was created so candidates can access and complete a form online for help with electronic portfolio system. The student workers in the Digital Media Studio also manage the E-Help desk.

One of the disadvantages of using student workers as support is that they will eventually find higher paying jobs or leave upon graduation. In terms of staffing the Digital Media Studio with a knowledgeable staff this puts a burden on the university with a routine turnover and ongoing training.

The University of Louisiana Monroe has been quite satisfied with its choice to use a commercial portfolio system. Although there were setbacks for the Implementation, Maintenance, and Support phases the system was a good choice for its respective programs. Students and faculty who found the system challenging in the beginning find it quite rewarding now. *Taskstream* has enabled the university to efficiently and effectively aggregate data for accreditation purposes, while being user friendly to both teacher education candidates and faculty.

#### Case 3: The University of Wisconsin Whitewater

At the University of Wisconsin Whitewater the Early Childhood/Special education degree program uses *Chalk and Wire* as their electronic portfolio system. There are approximately 30 teacher education candidates in each cohort group per year.

**Implementation Phase.** Program faculty created the three-phase portfolio, which uses the conceptual framework and common standards in the college, in addition to ECE and NAEYC standards and rubrics. Training was administered to faculty through hands-on training in small groups but for candidates it was administered in reflective seminars where the focus was portfolio development. In addition to training, the college technology lab had available drop-in support for both candidates and faculty members.

Teacher education candidates had difficulty submitting artifacts correctly in the electronic portfolio system, which caused difficulty for University supervisors to correct artifacts. Frustration also existed during the uploading of key assessments; the slow upload speeds caused frustration for both faculty and teacher education candidates.

**Maintenance Phase.** Faculty members and one technology coordinator at the University of Wisconsin Whitewater are responsible for maintaining the electronic portfolio system. Since the system is only used in one program with a cohort of 30 students, faculty takes ownership in terms of maintenance of the system.

One barrier during the maintenance phase is that software upgrades by the software provider are slow and require more training for faculty and students. In addition to the extra training requirements, students are also being assessed fees to maintain the systems since state grants which funded the initial costs for the system are no longer available.

**Support Phase.** Three types of support were offered by the faculty of the University of Wisconsin Whitewater and *Chalk and Wire*. Training was administered online, face to face, and through email. Few problems exist aside from training each new cohort. Some difficulty with off-campus supervisors who need access to the system exist, but this institution has experienced no serious barriers during the support phase of this system.

#### Conclusions

#### Implementation

Each of the aforementioned universities took a very different approach toward implementation of their system, but they had similar experiences. It is clear that administrative support is very important in terms of implementing a new electronic portfolio system. The dean must be supportive of the initiative in terms of financial, personnel, and moral support for faculty buy-in. Having the dean's support makes it easier to get faculty buy-in, which is essential for a smooth and efficient implementation process. The faculty members are responsible for submission of key assignments; their cooperation is necessary for getting artifacts uploaded to the electronic portfolio system.

Another key component in having a successful implementation is to implement in phases. As noted in all three programs, it is important to have a blue print of how the electronic portfolio system should work and function. All the key assessments and rubrics should be in place before creating the templates on the electronic portfolio system. Once the system has been designed, the next step is to train both the candidates and faculty. All three institutions used similar methods of training; setting up group training sessions seems to be the most efficient process by which to train teacher education candidates and faculty. Due to certain constraints however, group sessions maybe not work at all times; thus, individual training sessions may be required.

#### Maintenance

To run an effective electronic portfolio system that is user friendly and provides the required data for accreditation purposes, the system must be regularly updated. All three institutions have designated someone, either faculty member or administrator, to maintain the system to ensure the updates are successful. Having someone who takes ownership of the system will help the electronic assessment system evolve over time and with accreditation changes.

#### Support

All three institutions have provided multiple forms of support for both teacher education candidates and faculty. All provide a lab with face-to-face support for teacher education candidates and faculty to visit and work on their artifacts or ask questions regarding use of the system. Another support mechanism is online help in the form of an E- Help desk, manuals or Email. These methods allow candidates to write seeking help without having to come to a specific location.

#### **Implications for Practice**

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To successfully implement, maintain and support an electronic portfolio system both the dean and the faculty must support the concept. Designing and planning how the system will function before entering the information online will be vital to the system's success. Training will be easier if the design is simple so that the end users of the system are not overburdened.

Only essential and necessary information or key assessments should be submitted by the teacher education candidate to be evaluated by the faculty. Over-collecting the data causes confusion and extra work.

For best results one person should take ownership of the system. That person learns the software in an in depth manner, allowing the program to evolve over time. The individual becomes well versed in all areas of the system and understands the needs of the system. The individual also understands the end user and effectively meets the necessary requirements of both the users and the system.

Finally, do not buy into the bells and whistles of a product which may never be used. Instead research each product and compare the capabilities and limitations to the specific needs of the university. Taking these implications into consideration before launching an electronic assessment system should ease the implementation, maintenance and support issues for the university.

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