

ePORTFOLIOS: USING TECHNOLOGY TO ENHANCE AND ASSESS STUDENT LEARNING

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Tracking and assessing student learning outcomes within one course can be accomplished with relative ease. However, the true challenge lies within providing data for student learning outcomes for an entire program. The purpose of this descriptive study was to discover and explain the fundamental lessons learned from the beginning stages of ePortfolio implementation in a cohort master's degree program for secondary teachers. A questionnaire was administered to all twenty-six students at the end of their first semester to assess three student learning outcomes: self-knowledge, technological and organization skills development, and knowledge and skills transfer. After the first semester of implementation, students still see the ePortfolio concept and process as an external component to their master's degree and a separate skill with the technology currently a barrier and fail to see how ePortfolios are connected to their master's degree program. Results may reflect the current status of traditional assessments that is both state and nationally driven, indicating a need to continue to make the shift in paradigm of program design and assessment.

A paradigm shift in the past decade has changed the focus in education from a teacher-centered instructional environment to a student-centered one (Brooks, 1997; Terheggen, Prabhu, & Lubinescu, 2000). As a result, universities are held responsible for and expected to provide evidence of the process and growth in student learning over time. Grades are no longer proof enough of learning; multiple stakeholders in education want documentation that demonstrates the entire *process* of learning (Heaney, 1990; Terheggen, Prabhu, & Lubinescu, 2000; Villano, 2005). Ruhland and Brewer (2001) call attention to the increased demands for accountability that emphasize assessment of student learning.

To answer these calls for change, universities have begun to focus on student learning outcomes as a way to measure what students have learned and are able to do when they complete their degree. Outcomes assessments "include the knowledge, skills, and attitudes that determine what students know now that they didn't know before their college experience" (p. 142). Learning outcomes may be evaluated through various measures depending on the academic program, the philosophical beliefs of assessment practices on the part of the faculty, college and/or department, and measures whether students have reached the learning expectations. Due to the assessment emphasis

alternative processes to the traditional test are being developed as a means to meet accreditation and accountability expectations (Ruhland & Brewer, 2001).

Multiple researchers concur that the best learning, which is retained, occurs in the context of an active learning experience. For example, learning is best facilitated in environments that provide for hands-on, experiential opportunities, accentuate student participation and interaction with peers, and encourage student-teacher communication (Astin, 1985, 1996; Tinto, 1987; Davis & Murrell, 1994; Kuh, 1996). Astin (1985, 1996) provides a foundational framework that states students learn as a result of their involvement level and demonstrated ownership. Astin states that quality educational programs have a learning environment that includes students actively engaged, high expectations, and continuous assessment and feedback (Astin as cited in Skawinski & Thibodeau, 2002).

A regional university in North East Texas, in partnership with a local independent school district, used Astin's framework as a guide when planning a new and unique cohort master's degree program in Secondary Education. The goal was to provide the best system for documenting student learning outcomes and ways to assess the overall program quality. It was important to be able to use an outcomes assessment process that would actively engage students where they would be responsible, reflective learners and provide assessment information for feedback to guide the student learning process and inform program goals, objectives and field-based learning experiences for quality

enhancement. Current investigations emphasize the value of "student effort and involvement as decisive elements in promoting positive college outcomes" (Davis & Murrell, 1994, p. 2).

Since research shows that ePortfolios can "enhance teaching, learning and assessment practices", this method of assessment was selected as a way to document and highlight the process of student learning and to measure student learning outcomes during their master's degree program of study (Lorenzo & Ittelson, 2005, p. 3). The EDUCAUSE Learning Initiative definition of electronic portfolios was used in order to have a collective way of thinking (University of British as cited in Lorenzo & Ittelson, 2005). This definition describes ePortfolios as "personalized, Web-based collections of work, responses to work, and reflections that are used to demonstrate key skills and accomplishments for a variety of contexts and time periods" (p. 3).

There was a strong incentive to use electronic portfolios as a means for learning outcomes assessment because it provided additional value and enrichment for learners. "The electronic portfolio creates a personal collection of thoughts and work that enhances the use and knowledge of technology, improves instructional practices and showcases the candidates for potential employers, students and students' parents" (Hewett, 2005, p. 27). Through the use of electronic portfolios, the responsibility of learning is transferred to the students. It allows them to be involved and engaged in the learning process and therefore keeps the focus on the learner-centered environment. Hewett's (2005) research

indicates that "electronic portfolios are being used by elementary, secondary and college educators to lead their classrooms toward learner-centered rather than teaching-centered learning environments. Hewett further states that "as a model for learner-centered classrooms, e-portfolios give students ownership and responsibility for their own learning" (p. 27).

Statement of Problem

Tracking and assessing student learning outcomes within one course can be accomplished with relative ease. However, the true challenge lies within providing data for student learning outcomes for an entire program.

Purpose

The purpose of this descriptive study was to discover and explain the fundamental lessons learned from the beginning stages of ePortfolio implementation in a cohort master's degree program for secondary teachers. Three student learning outcomes, self-knowledge, technological and organizational skills development and knowledge and skills transfer, were identified in order to document and assess learning.

Self-knowledge is defined as an increase in understanding of the relationship between theory taught in the graduate program as it pertains to the what, why and how of individual careers. Technological and organizational skills development is defined as an increase in technological skills, communication skills, and organizational skills. Knowledge and skills transfer is defined as the ability for "Master Teachers" to transfer the knowledge

and skills developed in the program to their classrooms. The study sought to answer the following research questions:

- 1) Do ePortfolios provide evidence of the process of learning and measure student learning outcomes?
- 2) Do ePortfolios provide evidence of the program's effectiveness as students articulate?

Methods & Procedures

Students participating in the study were members of a cohort in their first semester of coursework in a secondary education master's degree program. A questionnaire was administered to all twenty-six students at the end of their first semester. The questionnaire consisted of thirteen Likert scale response questions and two open-ended questions.

At the beginning of each semester, students were given a structure to follow for the design and development of their portfolio. Assignments were created which required constant communication via electronic means and the ability to express thoughts clearly and effectively, electronic peer review and editing, and other activities to facilitate the utilization of a variety of educational technologies. This structure outlined for them the minimum required artifacts/documentation and reflections that needed to be included in their ePortfolios. Organizational skills via the structure of the portfolio itself began the process of students thinking systematically.

Students were asked to identify qualities they believe a "Master Teacher" should possess by outlining characteristics, skills,

abilities and performances in the classroom. As students completed a cohort course each semester, they conducted a self-evaluation in order to compare their progress toward high qualities of a "Master Teacher". Students were asked to include documentation of how they have changed as a result of the knowledge and skills acquired within the course and explain/describe how they have developed toward their goal of becoming a "Master Teacher".

Through their experience one goal was for them to understand the benefits to portfolio development and other methods of assessment in the K-12 classroom. In addition to students identifying how they have changed as a result of the course and program, they were asked to provide evidence/documentation of how their students' learning has improved as a result of the knowledge and skills they have incorporated into their classrooms.

The data was examined to determine growth and changes in the three student learning outcomes as a result of the electronic portfolio development process. The results from the surveys and the experiences with the development and implementation of ePortfolios may be beneficial to other universities as they consider ways to document student learning outcomes and program evaluation.

Results & Discussion

Results from the ePortfolio learning outcomes assessment survey after one semester of portfolio implementation revealed that overall students were evenly divided in agreement, disagreement and

neutrality on the impact of the ePortfolio development process in assisting them in an increase in two of the student learning outcomes: self-knowledge and knowledge and skills transfer. However, the majority of students did find that the ePortfolio development process led to an increase in their overall technical skills and confidence in using technology. Results for each learning outcome will be discussed in detail.

Self-Knowledge

In the area of self-knowledge, students were asked if the activities they were required to complete as part of the development of their ePortfolio resulted in an increase of their knowledge in teaching. Students were also asked to respond to whether or not the reflection on their teaching was more apparent after utilizing the ePortfolio and if this process made them more aware of why they teach the way they do, if they are more aware of what changes need to be made in their teaching, and if they are more aware of how they are perceived by others.

In general, students were evenly divided in agreement and neutrality, but almost half disagreed that the ePortfolio development process led to an increase in their knowledge of teaching. However, the percentages are not overwhelming in any area for self-knowledge. These findings may be a result of only one semester of implementation and not be enough time for students to recognize how ePortfolios may impact their teaching. Table 1 provides the percentage distributions for agree, neutral and disagree responses for each self-knowledge item.

Table 1
Self-Knowledge

Item	Agree	Neutral	Disagree
Increase Knowledge in Teaching	33%	21%	46%
Reflections	46%	25%	30%
Why	42%	25%	33%
What	46%	21%	33%
How	46%	21%	33%

Technological & Organizational Skills Development

Upon introduction and implementation of ePortfolios within the cohort, it became evident that many individuals were lacking the basic computer skills expected of teachers today. This discovery was discouraging and may be an indication that graduates of teacher education programs are not receiving the technological training and skills needed prior to going into the classroom. This may also provide insight into the disappointing results found in the self-knowledge and knowledge and skills transfer learning outcomes. It is expected that once students become more familiar with the concept of ePortfolios and comfortable with the technology itself that the technology will no longer be seen as a barrier and students will be able to relate more to the concepts of self knowledge and knowledge transfer.

Students were asked if working with their ePortfolio resulted in an increase in their technological skills and abilities, if they were more confident with technology after working with their ePortfolio, if developing their ePortfolio helped them

become more organized, and if their communications skills were enhanced as a result of working with the ePortfolio and its assignments. Results from the survey revealed that more than half surveyed, 58%, believed that the ePortfolio development process (assignment upload, creation of the portfolio, emailing, publishing and more) resulted in an increase in their technological skills as opposed to 4% who disagreed. Thirty percent remained neutral in this area, but these individuals may already have the necessary technological skills required at this point in the ePortfolio development process. In fact, only seven individuals self-rated as novice users of technology as opposed to ten average users, seven advanced users and one expert user. When asked to rate their abilities after the ePortfolio development process, 43% original novice users scored themselves as now average users of technology and 20% moved from average to advanced users.

Exactly half of those surveyed believed that the ePortfolio development process led to an increase in their confidence in utilizing technology; however, results for organizational and communication skills were more evenly distributed. Organiza-

Table 2
Technological and Organizational Skills Development

Item	Agree	Neutral	Disagree
Technology Skills	58%	30%	12%
Confidence	50%	46%	4%
Organization	33%	38%	30%
Communication	33%	38%	30%

tion and communication is still in its infancy and these results may indicate that over the next two years there will be a positive change in these areas as additional activities and assignments are implemented requiring more organization and communication within the ePortfolio. Table 2 provides the percentage distributions for agree, neutral and disagree responses for each technological and organizational skills item.

Knowledge & Skills Transfer

Students were asked if specific knowledge and professional knowledge of teaching transferred into their classroom as a result of the ePortfolio development process. They were also asked if they observed some changes in their students' learning as a result of their knowledge transfer from the graduate program into their classroom, and if they integrated technology into their classrooms due to an increase in their confidence with technology. Finally, students were asked if their thinking regarding assessment practices of

their students changed after exposure to the ePortfolio assessment concept.

Results from specific and professional knowledge transfer, similar to the self-knowledge outcome were evenly distributed. Almost half, 46%, of the respondents disagreed that the ePortfolio development process led to a transfer of specific and professional knowledge in their classrooms and careers. This may also stem from the fact that they still see the ePortfolio process as an external rather than integral part of their education.

Over half, 54%, of the students disagreed that this process and all they have learned from it has resulted in a change in their students learning, indicating little transfer of the ePortfolio concept has occurred in their classrooms. However, encouraging are the results from their change in thinking of assessment practices. Table 3 provides the percentage distributions for agree, neutral and disagree responses for each knowledge and skills transfer item.

Table 3
Knowledge and Skills Transfer

Item	Agree	Neutral	Disagree
Specific Knowledge	33%	21%	46%
Professional Knowledge	25%	30%	46%
Change in Student Learning	38%	8%	54%
Change in Assessment	38%	30%	33%

Advantages and Disadvantages of ePortfolios

Students were asked to address the advantages and disadvantages they discovered with ePortfolios in two open-ended questions. Their responses were surprising in that they contradicted what some of the survey results revealed. The disadvantage most cited by the students was the technological barrier and their lack of confidence to utilize the ePortfolio system environment. It is expected that over time students will become more confident with the technology and in fact results from the technological and organizational skills learning outcome indicate a positive change in their technological abilities.

Students are beginning to realize the advantages of the ePortfolio concept in terms of assessment practices. A few individuals are investigating the idea of implementing portfolio assessment in their classrooms which indicates knowledge and skills transfer. Students also liked the ability to see other portfolios in order to learn about the success and challenges faced by their peers in their classrooms and the ability to share their thoughts with others.

Several discussed the added benefit of "less paper" and the fact that developing their portfolio electronically "forced" them to become more organized with more space to store information and allowed for a professional looking documentation of the ePortfolio.

Conclusions

After the first semester of implementation, students still see the ePortfolio concept and process as an external component to their master's degree and a separate skill with the technology currently a barrier. Students fail to see how ePortfolios are connected to their master's degree program. More importantly, students do not view ePortfolio development as a method of alternative assessment individually, programmatically, and/or in their classrooms. It appears they are slow to accept other methods of assessment with the onslaught of standardized tests and accountability measures for which these students are held responsible. What was learned from all results is the need to be more effective in helping students make that connection, and to integrate the ePortfolio concept firmly within the program. It is important to lay the foundation and

help students to bridge the gap between what they are learning in the cohort and what they do in their classrooms regarding ePortfolio. In their reflection activities, they do make that transfer; however, they do not see the connection of ePortfolios assisting in their teaching practices.

Results may reflect the current status of traditional assessments that is both state and nationally driven, indicating a need to continue to make the shift in paradigm of program design and assessment. The cohort is currently in its second semester of implementation and steps have been taken to better connect the ePortfolio concept into the program. Future courses include models of teaching, curriculum design, action research and leadership. As the cohort dives deeper into the capabilities and functionalities of the ePortfolio system, students will design and develop units and lessons which are aligned with state and national standards, create rubrics for grading, and publish for peers and instructors to view and evaluate. As a result of continuing to design and develop their ePortfolio it is anticipated there will be an increase in technological self-efficacy and progression in thinking of assessment practices. The final ePortfolio will demonstrate students' learning process and progress throughout the program and transferability of knowledge into their classrooms, in addition to informing programmatic decisions.

References

- Astin, A. (1985). *Achieving educational excellence*. San Francisco: Jossey-Bass.
- Astin, A. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development*, 37, 123-34.
- Brooks, M. (1997). Beyond teaching and learning paradigms: Trekking into the virtual university. *Teaching Sociology* (27), 1-14.
- Davis, T. M. & Murrell, P. H. (1994). Turning teaching into learning. The role of Student responsibility in the collegiate experience. (Report No. HE027588). Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED372702 1994-08-00)
- Heaney, B. (1990). The assessment of educational outcomes (Report No. EDO-JC-90-01). Office of Educational Research and Improvement ED Washington, DC. (ERIC Document Reproduction Service No. ED321834)
- Hewett, S. (2005). Electronic portfolios: Improving instructional practices. *Tech Trends*, 48(5), 26-30.
- Kuh, G. (1996). Guiding principles for creating seamless learning environments for undergraduates. *Journal of College Student Development*, 37, 135-148.
- Lorenzo, G. & Ittelson, J. (2005). An overview of e-portfolios. Educause Learning Initiative, ELI Paper, 1-28. Retrieved September 9, 2005 <http://www.educause.edu/ir/library/pdf/ELI3001.pdf>
- Ruhland, S. & Brewer, J. (2001). Implementing an assessment plan to document student learning in a two-year technical college. *Journal of Vocational Education Research*, 25(2), 141-171.
- Terheggen, S. L., Prabhu, R. P. & Lubinescu, E. S. (2000). From product to process: Enhancing learning through the use of student electronic portfolios. U. S. Department of Education, Educational Resources information center (ERIC). HE033685.

Skawinski, S. & Thibodeau, S. (2002). A journey into portfolio assessment. *The Educational Forum*, 67, 81-88.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: University of Chicago Press.

Villano, M. (September, 2005). Hi-octane assessment. *Campus Technology*, 19(1), 45-48.

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