

## Electronic Portfolios for Assessment of Program Standards in Teacher Education

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### Abstract

This qualitative, grounded theory study investigated the benefits of using electronic portfolios (ePortfolios) in teacher education programs as tools for students to assess how well they met program standards. Following the interviews of thirty-nine K12 student teachers, the benefits and obstacles in developing ePortfolios provided data about the responsibilities of education units, faculty and students to make ePortfolios a positive learning experience. A model for the use of ePortfolios for the assessment of program standards in teacher education by students, faculty and education unit was developed.

**Keywords:** Electronic Portfolio, ePortfolio, reflection, standards, outcomes, standards based assessment

This study was an investigation of the benefits of using electronic portfolios (ePortfolios) in teacher education programs as tools for student teachers to assess how well they met program standards. Traditionally, evaluation of the graduates of teacher education programs included high stakes testing and course assessments, even though most educators believed tests do not measure the process and outcomes of teaching adequately (Ahn, 2004). Over fifteen years ago, ePortfolios emerged as an effective tool for learner assessment because they allowed for the collection of “multiple examples of work” to demonstrate “rich content” providing “opportunities for selection and self-assessment,” “over time” (Hamp-Lyons & Condon, 1998). Today they help assess programs and faculty, as well as student learning (Lorenzo & Ittelson, 2005, Tuttle, (2007).

For the purposes of this research, an ePortfolio was defined as a tool that

provides an environment where students can: **collect** their work in a digital archive; **select** specific pieces of work (hyperlink to artifacts) to highlight specific achievements; **reflect** on the learning demonstrated in the portfolio, in either text or multimedia form; set goals for future learning (or **direction**) to improve; and **celebrate** achievement through sharing this work with an audience, whether real or virtual. (Barrett, 2006, p. 1)

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Student teachers completing their teacher education program were interviewed because the researchers believed the perceptions of students “can lead to improved practices and policies with regard to EPs” (Wetzel & Strudler, 2006, p. 69).

With the shift from teacher-centered to learner-centered environments in higher education, a focus has shifted to the demonstration of student learning and growth over time, in addition to summative evaluation. Research on ePortfolios has predominantly been conducted on the development of and technology used in ePortfolios and on case study analyses of education programs using ePortfolios (Jafari and Kaufman, 2006). Reflection and standards-based assessment are relevant themes to this research.

Reidinger (2006) found that two critical components in facilitating reflection in ePortfolios were for faculty to include learning objectives stressing reflection in their courses, and to teach learners how to reflect on their learning experiences. Doig, Illsley, McLuckie and Parsons (2006) found that instructors need to include systematic instruction on reflective writing for the ePortfolio to become a productive part of the learning process. They encouraged a stronger emphasis on reflection than on the technical aspects of creating ePortfolios. Faculty must articulate and teach their expectations for reflection, or learners may perceive that an ePortfolio is a collection of their work developed to obtain a teaching position (Jafar, 2004).

Professional standards have been established by educational professional organizations to delineate the behaviors, skills, and knowledge that are essential for successful teaching. The National Council for Accreditation of Teacher Education (NCATE) compiled these standards, and required that universities demonstrate how their learners meet the standards before awarding the university the right to accredit teachers. Based on discussions with focus groups of faculty and students, Wagner and Lamoureux (2006) recommended that faculty collectively and systematically review the ePortfolios to determine how program standards are met, and then use these results to revise and modify courses. The learner is responsible for meeting standards and demonstrating how the standards are met. “As a model for learner-centered classrooms, e-portfolios give learners ownership and responsibility for their own learning” (Hewett, 2005, p. 27).

## **Research Questions**

Two research questions served as the focus of this research.

Research Question 1: To what extent does the building of an ePortfolio assist learners in comprehending the standards of their teacher education program?

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Research Question 2: What is the best way to assess learner progress on program standards for a teacher education program?

### **Theoretical Framework**

The utilization of ePortfolios to assess standards in a teacher education program helps learners meet two distinct goals: demonstration of the construction of knowledge based on standards throughout the program, and the building of critical thinking skills as students reflect on their growth. Constructivist learning theory, along with John Dewey's reflective thinking, provided the theoretical framework for this study.

Constructivist learning theory supports the contention that learners learn best when they construct their own view of what they are learning (Duffy & Jonassen, 1992).

ePortfolios encourage learners to contemplate the standards of their programs, make decisions about how they mastered each standard, and build their own concept of the program standards as they write a reflection for each work sample. Pappert (1996) suggested that technology provides a means for more creative expressions of learning. This is the case with ePortfolios as learners select the work samples that best demonstrate their learning from all of the products they develop throughout their program. Different learners may select different work samples as examples of their development as teachers. ePortfolios utilize a constructivist approach for learners to demonstrate how they met the standards of their programs as they reflect critically on their growth throughout the program, and as they justify the authentic assessments they included in their ePortfolios.

Perhaps the most compelling benefit of ePortfolios is learner engagement in reflective thinking. Learners assessed the standards of the program, demonstrated how they met them with work samples, and provided evidence of their knowledge and skills. To accomplish this, learners were asked to reflect how their abilities and knowledge increased, demonstrating how they grew from term to term. This is the essence of Dewey's reflective thinking. He states that "the better way of thinking...is reflective thinking: the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration" (Dewey, 1933, p. 1). This powerful statement about reflection contains three clauses that are relevant to ePortfolios. First, ePortfolios require that learners think about their work. To select work samples isn't a casual task, and requires that learners justify their choices in terms of the standards. Second, reflection requires that learners give "serious... consideration" to the task. Serious consideration means learners consider multiple forms of evidence as they make decisions. With an ePortfolio learners seriously consider multiple work samples to see which best provides evidence of their growth as

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a future teacher. Third, "consecutive consideration" requires that learners give a "personal examination, scrutiny, inquiry" (p. 8). Learners begin to explore the standards during their first term in a teacher education program, and revisit them each term until graduation. This provides "consecutive consideration" as learners reflect on their growth related to the standards during each quarter of their program.

Dewey believed that reflection was essential for learners to form conclusions based on sound evidence. He further defined reflective thinking as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (1933, p. 9). "Active" means that learners are consciously aware that they are engaging in reflection and that they mean to do it. "Persistent" means that there is an ongoing process of reflection that continues until a decision is made based on sound reasons. "Careful consideration" means there is a review of the evidence carefully to determine if it supports the goal. All three of these elements of reflective thinking are required in ePortfolios when used as a part of the learning process. Learners should understand that they must think about the standards of their program on a regular basis, as they carefully consider the work samples they are creating and growth they are undergoing. Equally important is their reflection on the process of developing an ePortfolio.

## **Methodology**

This qualitative, grounded theory study helps explain the effectiveness of electronic portfolios as tools for student teachers to use to assess standards in a teacher education program beyond standardized testing and course evaluations. During spring 2007, a purposeful sample of 39 K12 student teachers at a private university in the south were interviewed regarding how electronic portfolios were useful for assessing the standards of their teacher education program; and what they perceived to be the benefits of an electronic portfolio as a culminating experience for a teacher education program.

Using a constant, comparison method, the interviews were recorded, transcribed, and coded to identify patterns in the student teachers' responses for each research question. An analysis of the raw data included open coding, axial coding, and selective coding processes as described by Strauss and Corbin (1990). Themes emerged from the data that provided insights for teacher education faculty and administrators to use ePortfolios effectively for program assessment and student learning. An analysis of the similarities and differences in opinions among the student teachers provided divergent opinions. Member checking was accomplished by having each student teacher review the transcript of their interview for accuracy (Miles & Huberman, 1984). Interview questions were purposely prepared to collect student responses to the two research questions of this project. Charts with narration represent the findings of this data.

## **Results/Findings**

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Research Question 1: To what extent does the building of an ePortfolio assist learners in comprehending the standards of their teacher education program?

*Interview Question 1: What is the purpose of standards in a teacher education program?* Both researchers individually read the responses of the student teachers, and then compared their ideas to form a conclusion. The table below indicates the frequency of learners who understood the overall purpose of standards in a teacher education program.

Table 1. Student teachers' perception of the purpose of standards in their teacher education program

Program of Study	Clear evidence they understood the purpose of standards	They had a close understanding of the purpose of standards	No evidence they understood the purpose of standards
Early Childhood (K-5) N= 28	4	4	20
Middle Grades (5 – 8) N = 5	1	2	2
Secondary Education (6 – 12) N = 6	5	1	0
Total	10 (26%)	7 (18%)	22 (56%)

A majority of the student teachers appeared surprised when asked to describe the purpose of standards, and admitted they had never thought about it beyond what the faculty told them. Student teachers were aware of the relationship of the standards to accreditation of the education programs, and believed the purpose for creating an ePortfolio was to demonstrate mastery of standards to the Professional Standards Commission. For the most part, they did not address the benefit of the standards or the ePortfolio to their own learning in responding to the first interview question. Two learners provided insight worthy of noting:

... is a plan that describes what your goals are as a department and gives a guideline as to what the overall message is that needs to be given to students.

This student teacher saw the purpose of standards to be the guidelines established by the education faculty to represent the qualities, practices and procedures they believed were essential for a person to be an effective teacher.

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Just like the frame of a picture, if any piece is not properly secured or is missing, a picture won't hang on the wall. Such is the case with the educational conceptual framework. If any component is missing or weak, your approach to teaching a student is weak. Every piece must be strong and intact in order for student learning and success to be achieved.

The faculty of this College of Education established nine standards for the teacher education program that served as the guiding force in course development and assessment. These nine standards provided the structure for the ePortfolio. This student teacher expressed how the different standards were interrelated, and how essential it was to master all nine of them.

That 74% of the student teachers did not have a sense of the purpose of standards in their program was an indication that ongoing emersion for students needed to take place in every course throughout their program, including an orientation at the beginning of their teacher education program.

*Interview Question 2: Describe the conceptual framework for the Division of Education.*

The same procedure was followed for assessing this interview question, and a larger percentage of learners were able to discuss specific standards as they related to their program of studies. Twenty-eight percent were able to explain what the different standards meant in the program, 28% chose to list them without further explanation, and 44% failed to discuss the standards of the program.

Table 2. Student teachers' comprehension of the specific standards of their teacher education program

Program of Study	Could explain the standards of the CF	Listed the different standards of the CF	Could not list or explain the standards
Early Childhood (K-5) N= 28	5	10	13
Middle Grades (5 – 8) N = 5	2	0	3
Secondary Education (6 – 12) N = 6	4	1	1
Total	11 (28%)	11 (28%)	17 (44%)

When learners were asked to discuss the specific standards of their program, they were more comfortable and able to address them, applying the standards to learning and the skills required to become a teacher. None of the learners mentioned accreditation. These responses were more detailed and longer.

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Although I am unfamiliar with the conceptual framework at other institutions within the state, the conceptual framework for ... is extremely comprehensive. It encompasses all areas of education from learning to management to performance to professionalism. It makes students really gage why they want to be teachers and what methods and techniques they will use to become better teachers throughout the years.

One middle grades student teacher indicated that students could personalize the standards to their own needs, and that the faculty seemed to interpret the standards differently depending on their content areas.

... Everyone's concept on the specific strands is different. However, they have the same goal in mind--moving our students forward.

Student teachers visualized the graphic that demonstrated the standards, and were able to expound on each of the different standards. One indicated that without a visual, she probably wouldn't remember the standards. This division of education has a picture of a tree with nine branches representing each standard. The tree was painted in the entry of the Division of Education, and was put on its stationery, syllabi, and hung in each classroom.

The Conceptual Framework... can be described as a tree (teacher) in full bloom (full development). Each branch represents an area of teacher training...

...incorporates everything that you have learned and incorporates it into one puzzle. Each branch of the CF is like a puzzle piece. You must have all of the pieces in order to put it together...

Building an ePortfolio was an effective tool for 44% of the learners to understand the purpose of standards in teacher education, and for 56% of the learners in helping to understand the specific standards of their program. The other student teachers successfully completed their EPortfolios without being able to discuss what a standard is, or what the specific standards of their program are, in spite of the fact that the standards were used to organize the ePortfolio.

Research Question 2: What is the best way to assess learner progress on program standards for a teacher education program?

*Interview Question 3: How useful was this ePortfolio in helping pull the elements of your program together for you?* Surprisingly, 100% of the student teachers expressed that the

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ePortfolio was beneficial in assessing their teacher education program and in helping them pull the standards of the program together during student teaching, even though 23% of the learners thought it was a stressful task.

*Truthfully, it was an arduous task that I did not enjoy. Now that it is completed and I look at the finished product, I am proud of it. It brings much of my work into one document. It really looks polished.*

*I was always taught that at the end of a sequential lesson, there needed to be a culminating activity to pull it all together. This is just what an efolio is. It pulls together everything we have learned, and shows ourselves and others just how much we learned, and how prepared we are to teach. I enjoyed the final result of the efolio. I will be proud to show it to future employers.*

Learners expressed that the process of writing the ePortfolio helped them develop as teachers, pulled the program together, and helped organize their ideas about the program. In developing the ePortfolio, their program became more than a collection of courses, and became a unified whole. Specific references to the standards were made by 28% of the student teachers. Because the students put so much effort into their ePortfolios, they wanted them to be graded assignments in each course.

*The only suggestion I would have is for the professors to stress to the students the importance of the CF, because each branch of the tree was completed in each class that I took...*

*...I do not feel the efolios were done for the sole benefit of the students but as a way to show case the education program to the PSC. I also do not understand why it is not graded but is a requirement for graduation.*

Practical considerations as employment following graduation were mentioned by 21% of the student teachers. One student felt having a digital presentation of their work would help them obtain a position in another state without having to travel.

*If I were applying for a position out of state this would be useful to help them to meet me without meeting me.*

Technological considerations were also important to three students (8%). This university used ePortfolios in middle grades and secondary programs for eight years, and in early childhood for 4

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years using FrontPage®. Learners expressed that they were glad to know how to use the technology, but doubted they would ever create a web page in their classrooms. New technologies like wikis would be more beneficial because of their ease of use, cost, and accessibility.

*It eliminated a lot of paper work, and put everything in a nice and orderly fashion.*

*As for becoming a teacher, I think we should know how to make web pages, but the possibility of creating one for the classroom is slim.*

Comments by 21% of the student teachers directly addressed the usefulness of ePortfolios as reflective tools. The student teachers said they reflected on what it meant to be a teacher, on the teaching process, on what they believed, and on what they had to offer teaching. While 36% mentioned the ePortfolio was a collection of their work, having 21% go beyond the collection of material to reflection was encouraging. The progression of learning from a collection of materials, to seeing the program as an integrated whole, to the reflective process can be seen in these three quotes.

*To actually see my work in progress and see how much I have learned over the past two years filled my spirit with joy. [collection of work]*

*When I finished my efolio, I was amazed how everything fit right together and I knew that there was a purpose for completing the efolio. [integrated whole]*

*The process of building my efolio was a great experience for me. Although stressful at times, it was a great assignment for reflection. In my mind, I knew what I thought.... I have grown as a teacher! I loved looking back on past lessons and saying to myself "What were you thinking?" It allowed me to see just how far I have come thanks to the influence of great professors and wonderful experiences.*

Student teachers considered the use of ePortfolios to be an overwhelming success in helping them understand the interrelationship of the parts of their program to meet the standards.

*Interview Question 4: If ePortfolios were not used as an assessment tool, and you had to come up with one project that would best demonstrate that you had met the branches of your CF (standards), what would it be?* Student teachers came up with a variety of assessments in lieu of an ePortfolio, although they were unanimous that the ePortfolio was best. Twelve indicated that

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they couldn't think of any other assessment that would be as effective as an efolio, and offered no suggestions.

A portfolio, but I must say I would much rather use an e-folio now that I have one.

Twenty-seven students suggested the following: 3-ring binder portfolios (15), scrapbooks (3), oral presentations to the faculty and learner teachers (3), learner teaching evaluations (2), PowerPoint® presentation (2), field journals (1), thematic teaching unit that meets all the standards (1), writing an essay on each standard (1), exit interview (1) and Live Text ePortfolio (1).

A few comments bring the power of the ePortfolio to life.

I believe the efolio should be accompanied with a presentation where all education professors are in attendance.

Students expressed pride in their final ePortfolios, and wanted to share them with other students and faculty. They wished they had been able to see examples as they were developing their own, and felt students that were beginning the program could benefit from seeing the final products of student teachers. They also believed the faculty would do a better job of integrating ePortfolios into their own classes if the faculty assessed the work of all the students.

...It surely wouldn't be as good as it is now! I think we can fake being a good teacher when our professors come to observe us. I think we can write good lesson plans and not implement them. But the efolio incorporates who we are, what we do, and how we do it. You can't fake student learning and success, and the efolio makes use of all these things. I don't think there is a better tool to use to assess our performance as learner teachers.

## **Recommendations**

Student teachers supported strongly the use of ePortfolios as their capstone experience to demonstrate their meeting program standards. The following recommendations came from their reflections on the process of developing the ePortfolio.

### **Recommendations for the Professional Unit**

Program outcomes/standards based on sound theory and research should be developed with input from all faculty in the program.

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Based on a review of the ePortfolios, the program unit should review the standards annually to determine if they are still relevant or if modifications, deletions, and additions should be made.

The professional unit should select an active technology like wikis or commercial software for students to use to develop their ePortfolio. This will increase collaboration with peers and faculty, and provide for faculty interaction and feedback on a regular basis. Using Web2.0 tools enables the electronic portfolios to become a more useful and ongoing assessment of learning. Using tools that encourage collaboration would make this a stronger learning experience, rather than just a collection of artifacts for each standard.

An orientation should be held each fall to orient the students to the ePortfolio and to the program standards.

The program should have a graphic portrayal of the standards to make them easier to remember.

Faculty should be trained to develop ePortfolios so every faculty member is engaged in the process and can facilitate learning in their classes.

Developing the ePortfolio and collaborating with peers should be a part of every field experience

A one-credit course each quarter to work on ePortfolio would be useful.

### **Recommendations for Faculty**

Faculty should use program standards in building their courses, syllabi, and course projects.

Faculty should reference the standards as appropriate throughout each course

Faculty should teach students how to write reflective statements.

ePortfolios should be graded.

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Assignments for the ePortfolio should be included and graded in each course.

### **Recommendations for Students**

Students should meet the outcomes for each course, build projects that demonstrate the standards, and post to their ePortfolio each term.

Students should reflect on their growth related to the standards from one term to the next to demonstrate how they are building these skills and knowledge.

Students should provide sound evidence to support their selection of work samples to demonstrate their learning.

Students should collect work samples from the beginning of the program, save them digitally, and backup work samples so they are not lost if a computer crashes.

### **Theoretical Model of ePortfolios for Standards Assessment**

From the insights of these students, a model of ePortfolio development for standards assessment was developed. The unit has the responsibility to establish program standards based on sound research and theory, educate faculty to use them, introduce students to the standards, and provide software and training in the development of the ePortfolio.

Faculty have the responsibility of working with students to help them learn to reflect on their growth and learning. Faculty should not assume that students know how to reflect, so providing instruction and feedback on an ongoing basis is essential. If the standards are a critical component of each class, then they will become a part of discussions, assignments, and assessments.

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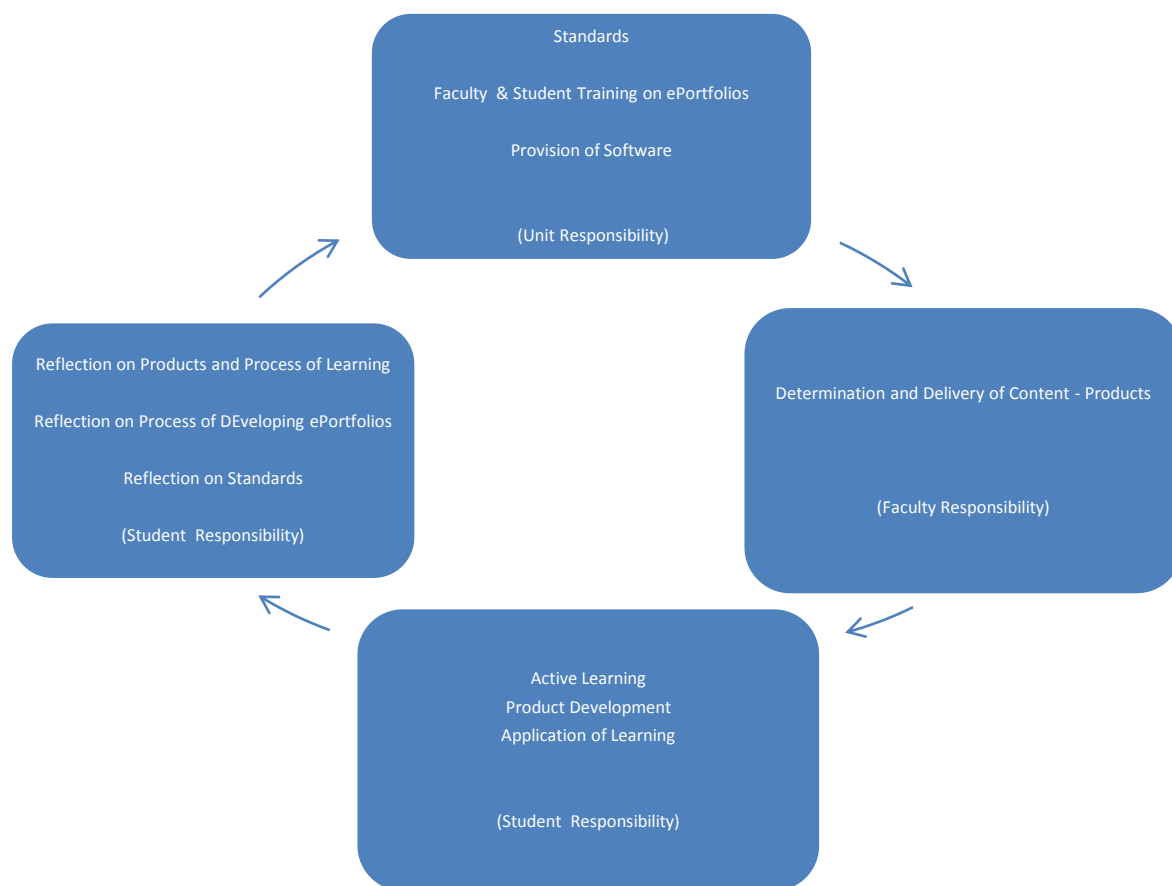


Figure 1. Electronic Portfolios for Assessment of Program Standards in Teacher

Students have a two-pronged responsibility for their learning. Traditionally, student responsibility for learning was to create the products required by faculty, and this is still a requirement of student teachers. In this program, students were required to provide three samples of evidence to demonstrate each standard, along with two work samples from students/lessons in field experiences.

ePortfolios add a dimension that requires reflection about the learning that is taking place related to the program standards. For each work sample, students were required to write three paragraphs: (a) describing how they had grown in terms of the standard, (b) how the work sample represented the standard, and (c) how they had demonstrated that standard when working with students in their field experiences. This meant that students had to demonstrate they had acquired the skill/knowledge, that they could develop projects and teaching materials that

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demonstrated the skill/knowledge, and that they could teach that skill/knowledge to students in the field.

At this point, the student reflections and work samples should be assessed by the professional unit to determine if the program standards are still relevant or if they should be modified. As the unit evaluates the ePortfolios, decisions can be made about course revisions, and other unit changes that need to be made based on student input. EPortfolios become a tool for both student and program assessment, requiring reflection by both the learners and the faculty.

### **Further Research**

A qualitative study should be conducted to determine how best to get students to buy into the ePortfolio and standards assessment in teacher education. How do you help students envision the ePortfolio as a learning experience?

An analysis of work samples and reflective paragraphs included in the ePortfolios would provide better evidence of how well learners met the program standards. This data could be compared with the interview data to see how well the verbal comments of learners were reflected in the ePortfolios.

### **Educational Relevance for Social Change**

Many State Departments of Education are requiring teacher education departments to use ePortfolios to demonstrate that student teachers meet program standards (e.g. Georgia), along with standardized tests. Teacher education faculty must find ways to engage student teachers in collaborative and reflective work about their programs standards. Web2.0 and social networking software provide technology that substantially improves the successful uses of ePortfolios for student reflection and learning, making them an ongoing part of the educational process. This research provides insight into the use of ePortfolios in teacher education programs that will help bridge the gap to new technologies, providing a tool for powerful assessment of program standards and student learning.

This research provides a four step circular and ongoing model for effectively using ePortfolios to assess standards in teacher education programs, including the roles of the teaching unit, faculty, and students. When any element of this model is omitted, ePortfolios are not likely to be successful for program revision or student learning. This study will improve practice in teacher education programs when all four process elements are implemented as an ongoing component of program evaluation.

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