

# The Diffusion of Electronic Portfolios In Teacher Education: Next Steps And Recommendations From Accomplished Users

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## Abstract

*This is the second part of a two-part article on the diffusion of electronic portfolios in preservice teacher education. The first part addressed issues of adoption and implementation; this part documents “next steps” and key recommendations by informants from the six programs studied. Next steps included streamlining requirements, addressing reliability of technology and access, and planning for data aggregation and program evaluation. Key recommendations were to involve a broad base of participants in the planning process, clarify the purposes for electronic portfolios, move forward incrementally, and provide sufficient technology access, training, and support. The study concludes that a range of research is needed to inform future decisions pertaining to the large-scale implementation of electronic portfolios in teacher education.*

## INTRODUCTION

The first article of our two-part series on the diffusion of electronic portfolios in teacher education addressed the conditions that led to the initiation and implementation of this innovation (Strudler & Wetzel, 2005). Our focus was to examine mature, well-articulated efforts in programs in which faculty and students have used electronic portfolios program-wide for two or more years. Using the same theoretical framework on educational change (Fullan, 2001; Hall & Hord, 2001), the second part of this study documented the “next steps” planned and the recommendations of stakeholders at selected universities. Specifically, the study sought to answer the following two research questions:

1. What are the “next steps” envisioned for the electronic portfolio program?
2. What recommendations do experienced users of e-portfolios have for programs in earlier stages of adoption or implementation?

Sites were identified and visits were conducted by the research team during November and December 2004 for approximately two to three-days each. During that time, semi-structured interviews were conducted with teacher education faculty, university administrators, teacher candidates, recent graduates, and technology support providers. It was our intent to interview a cross section of informants that reflects a range of perspectives and participation in the process. Subsequently, all interviews were transcribed and then analyzed using the constant comparative method (Strauss, 1987). Interview data were triangulated

using field notes from observations and a review of available documents to confirm the trustworthiness (Lincoln & Guba, 1985) of the findings. Further details about the methods employed can be found in Strudler and Wetzel (2005).

## FINDINGS

### 1. What are the “next steps” envisioned for the electronic portfolio program?

Consistent with the notion that change is a complex, socio-cultural process that takes time (Fullan, 2001; Hall & Hord 2001), the universities selected for this study experienced many challenges as they planned and implemented complex electronic portfolio systems that served multiple purposes. Some of the challenges have been resolved, but for others, university personnel developed short- and long-term plans to address them. We asked stakeholders at each institution about the next steps that they envisioned for their electronic portfolio program. The responses fell into three categories: issues that related to the streamlining of their programs, issues of reliability and access, and the need for data aggregation and program review.

#### Streamlining Programs

*Faculty Time Issue/Checkpoints.* Several of the sites assessed student progress toward the standards and benchmarks at periodic checkpoints. The nature of the checkpoints and the timing of the checkpoints differed, but they all had certain due dates, for example, before student teaching, when at least one faculty member examined a student’s portfolio and evaluated his/her progress toward the teaching standards.

In each of these cases, faculty and administrators commented on the amount of time required to implement the checkpoint procedures. We illustrate this challenge by focusing on California Lutheran University. Here there were three checkpoints after students were admitted to their teacher education program, called CLUES B, C, and D. Each involved a face-to-face meeting with each student by one or more faculty members, and depending on the checkpoint, a student teaching supervisor. Students would prepare their portfolios and present oral defenses of their progress and their professional development plans.

A director explained that these checkpoints have been increasingly difficult to perform:

Until recently, each of the checkpoints—CLUES B, C, and D—was evaluated by a team consisting of faculty members and supervisors. With increased student enrollment and change in the state standards (new standards were added) it has been difficult to ask faculty members and supervisors to read and evaluate each part of the student’s portfolio.

A chair explained the demands on faculty and possible modifications at California Lutheran:

I liked the interview. However, first of all, they were all during exam week or previous to that, and we didn’t have time. It was a terrible load on professors. Some people did it, some people chose not to. Also,

some faculty members felt that it was a little too labor-intensive— [more] than it needed to be.

The chair also explained the plan to reduce the demands on faculty time:

So this time . . . we're going to divide up the people and each professor will be assigned three or four people to read. But it would be one full faculty professor analyzing the benchmark. There would not be a team. Not with a face-to-face meeting. Now part of the thinking here is that [students are] interacting with professors on a weekly basis. So they were being monitored all the way through the process by the individual instructors.

At this time, the fourth checkpoint—the exit interview—would continue to include the oral presentation to the raters and peers. However, changes regarding the fourth checkpoint were also being discussed.

Eastern Kentucky also employed similarly timed checkpoints to evaluate student progress toward state standards. Elementary and middle school education faculty members were responsible for evaluating the electronic portfolios of students at certain checkpoints. Faculty members reported that it was difficult to conduct a substantive evaluation of each student's portfolio at the checkpoints. Some faculty members have a 10-minute interview with each student and others have an interview only with students who are experiencing difficulties. Checklists are used to determine if the necessary artifacts and reflections are present. A senior faculty member explained the time constraints:

I have nearly 100 portfolios and we are just desperately trying to get the student to get them done so we can evaluate them. To stop them and say "whoops" you really need to stop and spend a little more time on reflection [is not possible] when in fact students are scrambling just to get them done. So I think there hasn't been an emphasis on reflection.

In both of the above cases, faculty time to complete checkpoints was an issue. The core of this next step is consistent with the observation of Shulman (1998) that

Portfolios done seriously take a long time. They are hard to do. Teaching is a job that occupies every waking and nonwaking moment of a good teacher. Given such demands, the question is: Is it worth it? And if it is, is there any chance of reorganizing the life of teachers so they can do this hard work without killing themselves? (p. 35)

The comments of the stakeholders at these institutions indicated they took seriously the demands on faculty time and were contemplating strategies that would lead to streamlined procedures without losing the benefits of their checkpoints.

*Efficient Use of Student Time/Addressing Requirements.* The programs also recognized challenges regarding efficient use of students' time to complete the electronic portfolio. University of Iowa and Johns Hopkins provide particularly apt examples. A University of Iowa faculty member stated that the student time required should be re-considered:

And we've worked with the teachers of those courses to try to create a more realistic amount of stuff that the students would have to upload, that would still be enough to try to demonstrate that they know what they're doing as teachers, but not so much that it begins to seem like busy work to them.

A Johns Hopkins faculty member in the MAT program explained a new pilot study to determine if new procedures streamline the electronic portfolio requirements for students and the review process for faculty:

[In regard to INTASC principle one, two, and three], you identify the things that you have done that meets those particular INTASC principles. [In each of those categories] there are what we call required elements that need to go in the certain sections. We are toying with having one artifact address multiple INTASC principles to bring more synthesis and reflection to it. So instead of saying okay you have to have three things in for INTASC principle number 1, and two things in principle number two, show us in three maybe four big artifacts that you have developed, how you have met a variety of the principles. Because if you are using a unit plan you should be able to demonstrate within that unit how you addressed maybe nine or ten [of the INTASC principles not just one].

. . . my group again is going to be piloting these new versions of it in May so that we can see the changes in the amount of time it takes students and amount of time it takes faculty in the review process, whether or not it is really easier to score and get a painted picture of who these folks are as teachers.

### **Reliability and Access**

Informants also raised concerns related to technical issues. Although University of Rhode Island stakeholders addressed issues related to the server and technical support and Eastern Kentucky raised issues related to the tool students use to create their electronic portfolios, both cases illustrate next steps related to technology.

Originally, University of Rhode Island created an electronic portfolio system that was difficult to maintain and support. An administrator explained one part of the main problem, the server:

...if that goes down at the end of the semester on a weekend and you have a major crisis with students and their confidence in the system and their ability to move forward with their lives and upload things, and you know, you have them trying 20 times in the weekend to see if the thing's up, that's a problem.

Their next step was to select a new electronic portfolio system that is robust and supported by the university, not just by the college. The same administrator explained:

...what I'm trying to do, is get the University commitment to a system here on campus and provide resources for that system and support for that system.

A University of Rhode Island faculty member explained the differences between the previous and new systems:

Differences will be that there is going to be 24/7 support that's out-sourced; there will be someone else—at least initially—maintaining the hardware side of it; and there will be an increased ability—as I perceive it and I think this is one of the main reasons we want to go outside of what we're doing now, aside from the lower cost—to get our data back out in a way that we want.

Eastern Kentucky stakeholders explained the impact of students' backgrounds and their access to software to build electronic portfolios. Eastern Kentucky has the lowest tuition of any public institution of higher education in Kentucky and many students come from lower income families. The challenge and next step for Eastern Kentucky reflects this circumstance. Many of the stakeholders at Eastern Kentucky noted access issues affected by several factors. Students reported that they could not work on their electronic portfolios at home because they did not have Microsoft Front Page, the necessary software. Consequently, they were required to do their electronic portfolio work at the labs on campus. In addition, some students were completing course work at satellite campuses and at student teaching assignments some distance from campus. These students would save their electronic portfolio work until the end of the semester and attempt to make one trip to campus to complete it. The labs would be swamped with students late in the semester. As described in our prior article, the Eastern Kentucky electronic portfolio program was based on templates with links that students modify using Microsoft's Front Page, an HTML editor. An administrator explained a possible solution to this challenge:

The reason why we're doing some rethinking now is because while we had Front Page available here and the students have it, many schools don't. For a while Front Page was something you could get free. Now it's part of the Office package but many people use other products than Office. You have to buy Office with Front Page. We're experimenting. My guess is that the folks who are working on it will come up with new and creative ways to do it for less of a cost to the student and allow them to maintain it through more commonly used programs.

We found that technical issues such as server reliability and software accessibility affected time requirements for faculty and students and motivated faculty members and administrators to address them.

In summary, these universities were examining the amount of work that their electronic portfolio programs required for students and faculty and were re-considering the number of artifacts, the type of artifacts, and the depth of reflection needed for students to demonstrate mastery of a standard. Further, they were

considering strategies enabling students to use one assignment to meet multiple standards. Finally, they were addressing technical concerns that would make their electronic portfolio systems more user-friendly for faculty and students and sustainable by the school or college.

### **Data Aggregation and Program Review**

All of the programs were planning to gather data from their analysis of student portfolios to use for program review and accreditation purposes. Once again they were in different stages of preparation to mine the data from the scoring of entries in the electronic portfolios. Three cases, Johns Hopkins, IUP, and University of Iowa will be used to illustrate next steps in data aggregation.

Johns Hopkins was constructing a tool to help colleges of education capture key data and analyze it. A Johns Hopkins chair explained their purpose and their data analysis need:

It is an exit requirement that becomes driven by needs of accountability and accreditation. When you are up against NCATE standards and specialty organization standards and how do you show evidence of this and this? You can point to some of it from observations in classrooms, but a fair amount of it can be hinged on their portfolios.

The comments of the two IUP administrators are particularly illustrative of their future plans. IUP has immediate and longer-range goals for the use of the electronic portfolio system for program review and accreditation. The first administrator explained the plans they were beginning to implement including the database they were constructing to help them prepare for their NCATE review:

We have seven different gates for our initial and advanced programs, and one of the databases, which we'll begin using at the end of this semester, is related to the course assessments. So as faculty at the end of the semester begin using this key assessment system, they will go into Banner [the campus student information system] just as if they were entering final or midterm grades, and then instead of selecting the link to final grades, they have another link to access the key assessment component. And then, depending on whether or not the course has one, two, or three key assessments identified, there will be one, two, or three key assessment evaluation columns displayed by each student's name. Once again, the drop-down menus provide opportunity for entering unacceptable, acceptable, or target performance. Now that's the collection mechanism for the data.

The same administrator also explained the plan to use data for the NCATE review:

Behind that we have built mapping tables, and the mapping tables were determined by taking the individual key assessment matrices that were identified within each course. We've compiled those into program

matrices, and the program matrices show whether or not we do have full coverage, over 10 to 12 courses that make up a particular program, of the program standards, as well as the unit standards. Now, we'll be using the information from that course—in effect course-evaluation system—as one piece of the evidence that will be provided back to NCATE relative to the student's accomplishment of...well, standard number one—the content standard, standard number two—the use of the unit assessment system. The way that we've designed the system too, we're providing drill-down capabilities for the board of examiners. So we start off by providing a global view of student performance in the entire unit relative to the accomplishment of the standards and the individual descriptors of the standards. And then within each of those, we're providing additional linking capabilities to go to the program level, and then also to the course level.

In addition to these technical issues regarding tools and procedures, the bigger questions that need to be addressed are: What is good teaching? What is the domain to be measured? How valid are the artifacts and judgments? The second IUP administrator explained their long-range plan for the use of the electronic portfolio system for assessment:

So I think that the issue for us here is that, probably over the next four or five years, we'll see another level of development of these portfolios . . . I think questions about what do those artifacts tell you about the ability of our students to teach those children or youth, that one, I think, is still very open. I know NCATE's ambition here was to have us know by now very precisely [and be] able to define what that meant: what is the specific set of competencies that causes a new teacher to be able to get students to learn. I have to tell you that I think we're still working on that, and we will be for a while.

A major purpose of the electronic portfolio system at Iowa was program evaluation and accreditation. Faculty teams determined the artifacts from each course that would show evidence that the student was meeting each standard. However, an administrator discussed moving from an initial step—aligning artifacts with each standard to the next step—determining the degree to which all of the artifacts aligned with the standard demonstrate that the student has achieved the performance. An administrator explained the first stage of their data collection and recommended a next step:

We do now have artifacts that are associated with standards, but the next step is to have some shared understanding of what quality looks like when you're looking at a particular standard.... “Okay let's take a look at assessment, let's take a look at planning, and let's see what the students have uploaded, and let's see if we can come to a consensus to which of these is really good.” But it's above the artifact level, the important thing is the preponderance of evidence within a standard.

Although all of the programs were in different stages of development in their use of electronic portfolio data for program review and accreditation, they clearly were planning to continue to improve the processes for mining data.

## **2. What recommendations do experienced users of e-portfolios have for programs in earlier stages of adoption or implementation?**

In answer to this question, many of the informants presented recommendations that related to leadership and fostering faculty support for the electronic portfolios. In addition, it was recommended that the proponents of electronic portfolios need to be clear about the purposes for using them and they need to plan for the necessary training, support, and technology infrastructure.

### **Leadership to Involve Others**

In the first section of the paper, we reported that sites in this study had strong dean-level support for the initiation of their electronic portfolio programs. However, informants also recommended that a broad spectrum of stakeholders be involved in the decision making and planning processes. This recommendation is consistent with the literature that encourages a combination of top-down and bottom-up planning as the optimal approach for effective implementation (Fullan, 2001; Hall & Hord, 2001). An IUP faculty member suggested that this involvement is necessary to build support for electronic portfolios:

You need to figure out a way to be subversive and get it going from the grassroots so it's their idea. That ownership is crucial, and if there's no ownership there—true ownership, not forced, not placed on them, not “it's yours, now take it from here”—if we could figure out a way to do the true ownership, that's what I'm seeking. And I don't know how you do that...

Another IUP faculty member argued that there should be broad participation in planning including students, technology persons, and K–12 personnel:

I'd change the constituency of the people who are in the planning phase. I'd make sure that they were administrators, I'd make sure that they were technology persons, I'd make sure that they were students, and I'd make sure that there were public school personnel who ostensibly will be using these materials for hiring or assessment.

A Rhode Island faculty member provided advice on how to obtain buy-in from potential resisters:

Keep an open mind. Be flexible. Speak up if something isn't working. Have help groups or support groups. Meet separately with groups who don't want to use the system at all and show them how it can benefit down the line and now. Talk about some of the areas that sound like they're not going to work or could work more effectively—the inability to get in and actually write in to students' documents, the fact that we have to correct things twice, address those things when they come up. And I guess, most of all, be accessible to them.

It was emphasized that broad participation is the key if the electronic portfolio is going to be implemented program-wide. An EKU administrator pointed out:

I think you also have to make sure that it is part of your whole program and not just, “Oh you do the portfolio in these classes and the rest of the time you don’t have to worry about it.” That’s what we’re going toward, trying to make sure it’s part of our complete program at the elementary and middle, and to some degree the secondary, although we have less control of that. People have to see it as part of what they do also. It’s not just somebody else’s thing, it’s everybody’s.

### Clarity of Purpose

One of the strongest recommendations was that adopters be able to articulate a clear purpose for the electronic portfolios for all stakeholders. The advice regarding clarity of purpose is a recurrent theme across sites and informants.

An IUP faculty member discussed the effect of a perceived change of purpose:

I think you need to focus on what the purpose or purposes of these portfolios are going to be. And I don’t think we did that. As we said repeatedly, we saw it as an electronic briefcase, a collection of your work and nothing more, when in reality we knew we wanted it to be above that. And it was going to involve artifacts from courses. So get your objectives out there, your purposes: are we going to have this as a view through the checklist vehicle? Good, that’s one thing, but ... what will the unit get out of it? In terms of the data collection? The accreditation information? What will the programs get out of it?

Open communication among stakeholders regarding purpose is a recurrent theme. A Rhode Island faculty member explained that the purpose should be clear and connected to the program’s curriculum before beginning the electronic version of the portfolio:

You have to develop a portfolio system that you would continue using if all the technology disappeared tomorrow and you had to do it on paper and pencil. We really saved ourselves a lot of pain—it wasn’t intentional, but it worked out well for us—because we had done it on paper before we did it electronically. And that’s not to say there hasn’t been pain or that we’re not changing it as we go along, but I think, if you are developing an e-folio system, it’s really easy to get caught up in the “sexiness” of it, for lack of a better term: everybody’s doing it, it’s powerful ... but there’s no reason to go and do it simply because it’s technological.

The same faculty member articulated the need for faculty to develop a clear understanding of purpose:

The first thing that you need to do—because if you don’t do it at the beginning, you’ll have to stop somewhere along the way to do it—is to

sit down with everybody who's involved in using this portfolio—and I'm speaking of faculty, not students—and work out, put it down on paper concretely, why are you using portfolio assessment. What is the philosophy out of which this is coming? Now if it's because you have to do accreditation, and this is the best way to do it, I don't think that's problematic—that was a big guiding force for us—but we took the time to really talk about “why would we do this?”

Finally, a Rhode Island administrator explained the complexity and the balancing act involved in achieving clarity of purpose because the college has multiple and competing demands for both human and financial resources. The portfolios function is to further departmental goals, not to subsume them.

I mean, I want to produce data that enables us to strengthen our programs, but I also want it to be streamlined and functioning in a way that allows us to do other things. We have scholarship to accomplish, we have grants to get, we have outreach to communities and schools, and we have teaching to do. We can't spend all our time nurturing a folio system, and we need to have a place for it, it needs to function well for us in that regard, so that we can do other things. And faculty have time to do other things, even within their classes.

### **Providing Sufficient Access, Training and Support**

A major role of a leader is to provide access to technology, training and support for faculty and students to use the electronic portfolio system. However, this is not as easy to manage as it might seem because administrators must achieve a balance in providing resources for electronic portfolios with other college needs. In addition, training and support are ongoing tasks, not one-time events. A Rhode Island administrator articulated the difficulty:

You need to look at the resources you have available to do this. ...I mean, do you hire that language arts person, or do you bring in the person who's going to work with your databases and enable you to communicate between PeopleSoft [their university information system provider] and whatever folio system you use? Well, those are tough decisions and you'd better think about them up front.

A prerequisite for implementing an electronic portfolio program was sufficient access to technology, an adequate campus technology infrastructure, and continual support. A California Lutheran administrator explained:

My advice would be to make sure that everyone has computer capabilities that are going to make the use of the Web folio as easy as possible for both faculty and students [so they] can upload them at the university easily.

A Rhode Island technical support person concurred:

I think it's important to make sure you have the right technologies in place, and make sure they're working. You know, scanners, digital cameras, and digital video.

A California Lutheran administrator recommended providing sufficient support and training:

And one of the things you need is lots and lots of training. And you have to keep the training up, not just for the first six months or year, but it has to be part of an ongoing set of meetings and activities where people get together and share experiences and get training from outsiders.

### **Planning, Incremental Steps, and Pilot Programs**

All of the informants discussed electronic portfolio plans that started with smaller steps that provided the foundation for larger steps. An Iowa administrator explained the development process:

And you can't just impose it; you have to start building it. And we did the pilot study. I think [you'd need to show] some success before you went in and did it, for a large program in particular. I think if you can show success with a smaller group first, it might be very helpful because then people can see the potential...

An IUP faculty member explained the need for planning and gradually implementing:

First of all, it's just like anything else: plan it in advance. Set a time in the future to implement it; don't implement it on the run. And that would probably be the biggest key. And any project that requires change you do this: you spend time winning people over, you spend time training people, you spend time setting up your systems, and then you implement it. You don't implement it and then try to do everything on the run.

A California Lutheran support person recommended implementing in stages beginning with the early courses and continuing step by step through student teaching:

Start them out with the simpler levels and then work them up to the student teaching and the field placement. The people out in the field doing their student teaching in the field placement are so overwhelmed as it is and that was the problem we had when we started. They were just overwhelmed the first, probably four years. Then when we started getting the people that were doing the foundations in then they would come up to methods and then go to student teaching and then into their masters courses and now our program is starting to use it. I think it worked a lot better after that first year. I would say ease [it] in rather than throwing everybody into it.

## Time Required for Change

Consistent with the literature, the informants in this study stressed the need for time to implement electronic portfolio programs. The comments of a California Lutheran leader illustrated the sentiments of informants across colleges:

I know an institution is not going to get there in a semester, or a year. Maybe two or three if they're real smart about their strategies and the buy-in from faculty, but the buy-in from faculty is real critical at that stage 3. And if you don't have that, they're just not going to move on. And even in our little journey with this, we knew that we would have to address why, what folios? And we did that in the beginning. And the third year into our grant, we thought, okay, we're past that. Oh no. You get this backlash from faculty again and we had to back and revisit it again. I'm afraid I wasn't very good at that. I can see the vision, I can see what this can do, and for me to go back and talk with my colleagues about why we should be doing this, that they can't see it. I bit my tongue and we went through it again. And sure enough, there was buy-in.

## DISCUSSION

Our analysis of next steps and recommendations provide us with a virtual glimpse into the future. Although next steps inform us of the various directions in which the respective programs intend to go, the recommendations were intended to guide others' future adoption and implementation decisions. In analyzing themes across both, several key ideas emerge. First, findings of the study document the enormity of the change involved in implementing electronic portfolios on a large scale. As Fullan (2001) and Hall and Hord (2001) reinforce, change initiatives of this nature are complex socio-cultural processes that take time, perhaps as long as five to 10 years. As might be expected, recommendations include clarifying the purposes for electronic portfolios, involving a broad base of participants in the planning process, and moving forward incrementally from initiation and implementation to institutionalization. It is interesting to note that recommendations for others support Hall and Hord's notion that most change efforts overly emphasize development at the expense of implementation. The recommendations given by informants in this study almost exclusively address implementation issues rather than logistics for development, seemingly sage advice.

The next steps discussed reflect the respective program's efforts to assure sustainable change that meets the needs of the various stakeholders. From an administrative perspective, an important next step was to move forward with efforts to aggregate data, both for accreditation purposes and for program review and improvement. From the faculty and student perspective, important next steps were to streamline the process, making it more "do-able" and sustainable. Although there is much passion about the ideals of portfolios in teacher education, if the demands of the process are not reasonable and cannot be managed over time, then large-scale implementation of electronic portfolios will not likely be sustained.

Overall, even though this study provides us with a glimpse into future directions for the implementation of electronic portfolios, much research is still warranted. We need a range of studies that inform whether the large-scale implementation of electronic portfolios in teacher education is ultimately a good idea that should be pursued and sustained in the coming years.

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