

Using ePortfolio™ for the Assessment and Professional Development of Newly Hired Teachers

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In an effort to accommodate mandated standards-based assessment for measuring pre-service teacher quality, the Teacher Education Program at The University of Iowa has used for the last decade a web-based electronic portfolio system – ePortfolio™ (The University of Iowa, 2007) – to help pre-service teachers document fulfillment of professional teaching standards throughout their course of studies. In 2002, the State of Iowa introduced a policy mandating that first and second year teachers, like pre-service teachers, must demonstrate mastery of professional standards through a comprehensive sample of artifacts and performances. A collaborative effort involving a school district, a teachers' union, and a university customized the ePortfolio™ framework for use by early-career teachers.

The goal of the Iowa ePortfolio™ project for early-career teachers was to support the statewide implementation of the Iowa Teacher Quality Standards Act. During a grant-funded three-year period, over 300 Iowa teachers received training to develop their professional electronic portfolio based on the Iowa teaching standards. This study reports the findings of this project by addressing the teachers' and administrators' perceptions of using ePortfolio™ for teacher evaluation and the role ePortfolio™ played in helping early-career teachers understand teaching standards and organize teaching materials around those standards.

School administrators were trained to evaluate teachers with the ePortfolio™ system, and new teachers collected relevant samples of their work for review. Two fairly serious issues emerged as districts moved toward the implementation of the mandate. First, the collection, organization, and storage of teacher work were becoming serious challenges for many districts, especially those with a large number of first and second year teachers. The second and more substantial concern was that the physical nature of these artifacts meant that they must be carried away for review or reviewed in a central area and that revisions or additions to the teachers' samples had to be scheduled at times convenient to several parties. The

formative evaluation of work-in-progress that this new mandate promised, including professional and reflective dialogues between new teachers and their administrators, could be hampered by the logistics of managing large paper-based samples of teacher work.

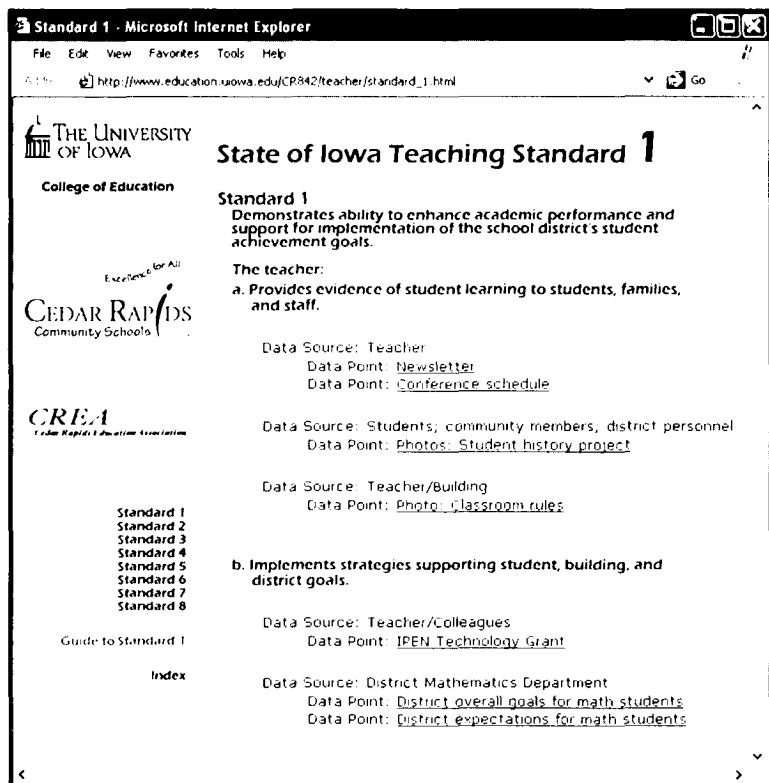
Anticipating these challenges, The University of Iowa College of Education teamed with the Cedar Rapids School District and the Cedar Rapids Education Association to adapt ePortfolio™ to contain teaching artifacts and summative evaluations required by the State Department of Education. The ePortfolio™ framework allows new teachers to upload their professional work easily and it allows administrators to review that work at any time simply by linking to the teacher's web address. The evaluator may also write commentary on the teacher's work and send that commentary confidentially to the teacher for reflection and possible revision of the work samples.

ePortfolio™ links samples to standards, evaluations

The University of Iowa ePortfolio™ project has demonstrated that electronic portfolios do far more than provide a convenient means of storing information. As teachers compose their web sites, the act of composition itself encourages multidimensional thinking by connecting the evidences of their performance to the established standards (Banister, Vannatta, & Ross, 2006; MacDonald, Liu, & Lowell, 2004). One of the primary benefits of developing any portfolio – digital or paper-based – could be the depth of an individuals' involvement in selection of contents (Wiedmer, 1998) and a considerable amount of thinking that they apply to the contents (Holt, McAllister, & Ingram, 2001). Unlike the linear path of paper portfolios, the interconnectivity of artifacts across pages in an electronic portfolio can promote a deeper understanding of the relationship between standards and performance, promoting a sense of professional efficacy (Holt, et al., 2001; Pecheone, Pigg, Chung, & Souviney, 2005; Tucker, Stronge, & Gareis, 2003).

According to Gibson and Barrett (2003), there are two approaches in electronic portfolio development. One uses generic productivity tool software (GT), such as word processing, web editors and other commonly used multi-

Portfolio assessment needs to be supported by a precise and clear evaluation rubric, a descriptive evaluation guide and criteria, well-constructed examples or indicators of competencies, and reflections (Lynch & Purnawarman, 2004). The Iowa ePortfolio™ framework offers those supportive components essential to portfolio assessment: templates pre-linked around eight standards and 42 criteria, evaluation guides and criteria, a comprehensive sample site, and a summative evaluation notebook. Each standards page is linked to a corresponding evaluation guide page that identifies appropriate examples of performance criteria, teacher behavior, and artifacts (Figure 1).



Evaluation Guide directly linked to an ePortfolio™ sample site

Figure 1. Relationship between evaluation guides and a standards page

media authoring tools. The other approach uses customized information technology systems (CS) that require specialized web servers, programming, and database capabilities. The primary distinction between these two approaches is a) the amount of learner autonomy needed to create and control aspects of the electronic portfolio and b) the degree to which specialized technologies are used to manage the aspects of the portfolio. Utilizing strengths and benefits of each approach, the ePortfolio™ framework developed at The University of Iowa is a hybrid because it utilizes templates for a unified look and consistent organizational scheme. At the same time the templates can be edited using generic production software such as word processing and web editors. The Iowa ePortfolio™ consists of a series of templates designed to accommodate eight Iowa standards and 42 criteria. All files that make up the ePortfolio™ are web pages or word documents. The design of the templates allows for flexibility and utilization of various tools to produce, distribute, and assess the teacher's ePortfolio™.

Methods

Project participants and selection procedures

Invitations to training sessions on developing and using an ePortfolio™ for teacher evaluation were sent to all administrators across the State of Iowa. Administrators nominated their early-career teachers for this training opportunity. Selection criteria stated that teachers must be:

1. classified as an early-career teacher in the State of Iowa (first or second year of teaching),
2. employed by an Iowa school,
3. willing to participate in a variety of assessment surveys,
4. willing to return to district or building to share ePortfolio™ materials and skills, and
5. willing to keep administrator and mentor informed about the process.

During the three-year project period, 301 early-career teachers were trained to use the ePortfolio™ framework. About 42% of the participants were elementary teachers, 24% were middle/junior high school teachers, and 33% were high school teachers. Reaching 60% of Iowa counties (59 counties), the early-career teachers in this study taught in diverse school settings from rural districts (61%) with a total school population of 249 students to urban districts (6%) with over 36,000 students. Outreach to a broad range of districts across all of Iowa – particularly rural districts – was a critical need area recognized by the project team.

Data sources and analysis

The data for the study were gathered from two independent sources: the teachers who participated in the training and the teachers' administrators. Every teacher who participated in this project completed a pre-training survey to assess their general technology skills and their understanding of the Iowa Teaching

Quality standards. Following the training, they completed an anonymous post-training survey to evaluate the quality and clarity of the training they received. A follow-up survey was conducted one year after the participating teachers returned to their schools, inviting them to report how their *ePortfolio*[™] had developed over the course of the year. During their evaluation process with administrators and mentors, 25 randomly-selected teachers provided an in-depth reflection journal on their use of *ePortfolio*[™].

An email-based survey was distributed to the administrators who were charged with evaluating the teachers participating in this project. The results of these surveys were compared with the surveys of teachers to locate points of agreement and disagreement. Response rates to the various assessment surveys ranged from 23% for the administrator survey to 75% for pre- and post-training survey and one-year follow-up survey by teachers. Samples for data analysis included 150 early-career teachers and 45 administrators of participating teachers. The early-career teachers (about 100) who participated in 2006, the third year, were not included in this study because they had not yet submitted their one-year follow-up survey. Descriptive statistics were used to analyze survey items with a five point Likert scale ranging from a low of one (Strongly Disagree) to a high of five (Strongly Agree). Data analysis included frequencies of each survey item, mean scores (*M*), and standard deviations (*SD*). Common tendencies and themes were also collated from open-ended question responses and reflection journals.

Results and Discussion

Teachers' and administrators' attitudes towards ePortfolio[™]

As shown in Table 1, both participating teachers and their administrators were enthusiastic about the use of *ePortfolio*[™] in their evaluation process. Over 90% of teachers indicated that they shared their *ePortfolios* with their mentors and colleagues and would recommend that other early-career teachers use the *ePortfolio*[™] to demonstrate fulfillment of teaching standards. About 76% of participating teachers reported their administrators supported their use of *ePortfolio*[™] to demonstrate their performance tied to standards. Interestingly, despite the time commitment necessary to thoroughly review *ePortfolios* or portfolios in general, over 90% of the administrators in this study indicated that they would encourage

teachers in their district to build and maintain an *ePortfolio*[™] for licensure purposes and/or the five-year review process. Further, 72% of administrators showed their interest in using the *ePortfolio*[™] framework to build an administrative portfolio based on the six standards for school leaders developed by the Interstate School Leaders Licensure Consortium.

Benefits of ePortfolio[™] for assessment

The Iowa *ePortfolio*[™] framework facilitates easy and frequent updates of teachers' *ePortfolios* – up to and even while – administrators are reviewing work. This constant access to work samples and prompt feedback are essential to the formative evaluation process in promoting and capturing on-going reflection of teachers' professional development and overall growth (Pecheone, et al., 2005; Wetzel & Strudler, 2006; Wiedmer, 1998). In the present study, 70% of the participating teachers confirmed the benefit of the *ePortfolio*[™] for easy access and updates as they made revisions or additions to their portfolio during review.

Besides the easy access and updates, past studies also cite the advantages of electronic portfolios including easy transfer of materials among portfolio creators and reviewers, flexible storage and organization, increased technology skills, and easy display of multiple data points using text, images, and video (Ahn, 2004; Bartlett, 2002; Tucker, et al., 2002; Wetzel & Strudler, 2006). Supporting the findings of previous research, the teachers in this study also confirmed these benefits of an *ePortfolio*[™] such as ample storage space, an efficient organizational scheme, portability, interactive presentation capability, and multiple linkage opportunities. For example, 78% of teachers and 90% of administrators who participated in this project reported easier communication about materials collected for the performance review. Administrators especially expressed more positive attitudes about the *ePortfolio*[™] as a communication tool in teacher evaluation than participating teachers (see Table 1, teachers *M*=4.06, administrators *M*=4.47).

Regarding ample file storage and portability of portfolios, one participating teacher stated:

I can transport my entire portfolio on a string around my neck, on a CD in my purse, or on the waves of the Internet. I never have to worry about one person, such as an administrator, possessing my only copy of my teaching portfolio. My administrator can keep a copy of my portfolio for weeks or months without worrying about when I need it back to work on it or share it with a colleague.

The advantage was also confirmed by her

Survey Questions	Mean	SD
Administrators' overall perception/personal value about ePortfolio™ (N=45)		
I would recommend to the early-career teachers in my district that they use the ePortfolio™ to demonstrate fulfillment of Iowa's Teacher Quality Standards.	4.44	.76
I would encourage teachers to build and maintain an ePortfolio™ for licensure purposes and/or the five-year review process.	4.40	.75
I would be interested in using the ePortfolio™ framework to build an administrative portfolio based on the six standards for school leaders developed by the Interstate School Leaders Licensure Consortium.	4.00	.98
Administrator's Perception about using ePortfolio™ enhancing the evaluation process (N=45)		
I have reviewed ePortfolios™ developed by the teacher(s) who participated in the Carver teacher workshop.	4.58	.75
I have found it easy to communicate with the teacher and mentor about the materials collected for the ePortfolio™.	4.47	.66
The teacher has made decisions about and sometimes made changes in the ePortfolio™ based on conversations with me regarding performance.	3.71	.92
Teachers' overall perception/personal value about ePortfolio™ (N=150)		
I would recommend to the early-career teachers in my district that they use the ePortfolio™ to demonstrate fulfillment of Iowa's Teacher Quality Standards.	4.45	.74
I have spoken to colleagues about my use of the ePortfolio™.	4.39	.68
Teachers' Perception about using ePortfolio™ enhancing the evaluation process (N=150)		
My administrators have been supportive and helpful in my use of the ePortfolio™ to demonstrate my fulfillment of Iowa's Teacher Quality Standards.	4.09	.93
I have communicated with the administrator(s) evaluating my teaching performance about the materials collected on my ePortfolio™.	3.96	1.01
I have found it easy to communicate with administrators and mentors about the materials I have collected on my ePortfolio™.	4.06	.81
I have made decisions about and sometimes made changes in the materials I have collected on my ePortfolio™ based on conversations with administrators and mentors.	3.58	.98
I have placed materials in my ePortfolio™ under new or different standards based on conversations with administrators or mentors.	3.40	1.06
Teacher's perception about technology support level in developing ePortfolio™ (N=150)		
I have been able to find technology support if I had questions about the use of the ePortfolio™ in my home district.	3.44	1.08
The computer technology available in my district is sufficient for my use of the ePortfolio™.	3.59	1.20
Administrator's perception about technology support level in developing ePortfolio™ (N=45)		
My teacher has access to technology support.	4.73	.50
The computer technology available in my district is sufficient for developing the ePortfolio™.	4.60	.65

Rating Scale: 1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, and 5=Strongly Agree

Table 1: One-year follow-up survey responses

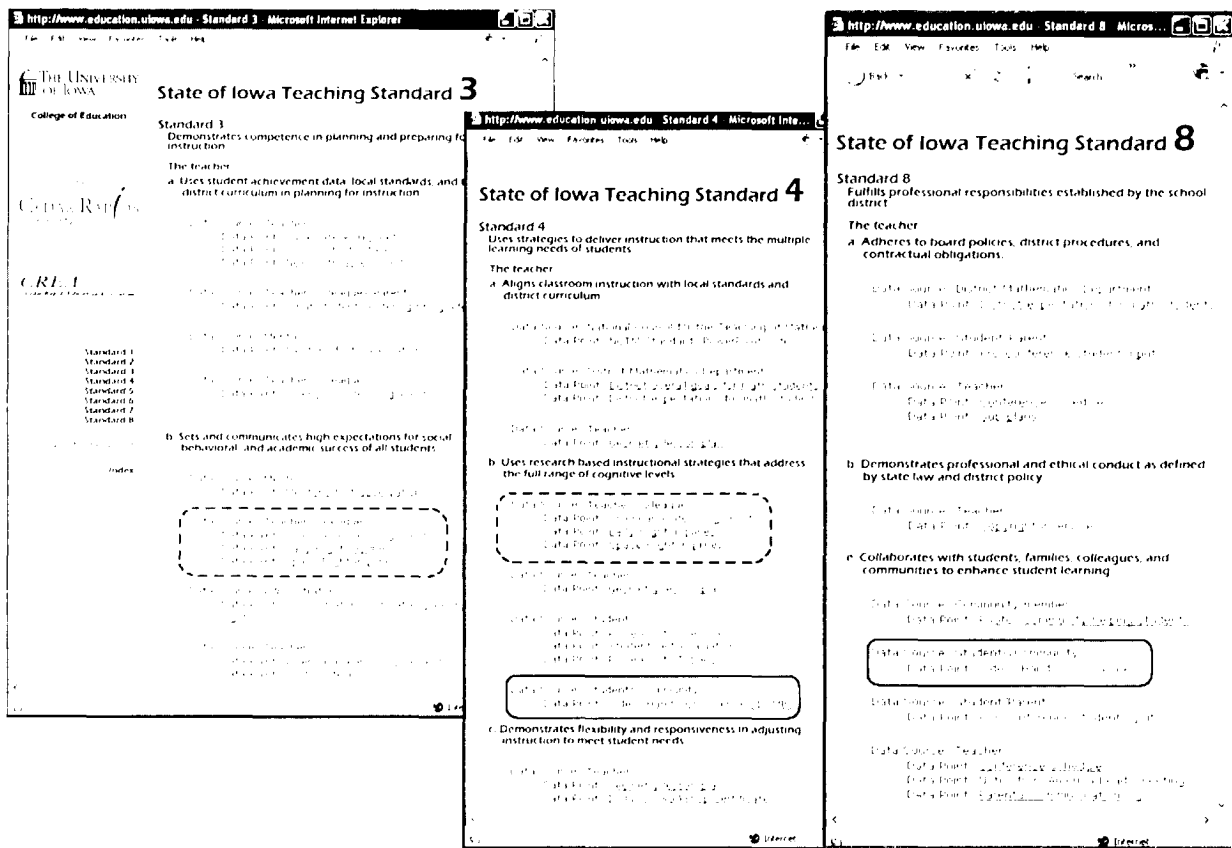


Figure 2. Multiple links indicating multiple paths of relationship among artifacts

evaluator: “My evaluator stated that it was much easier for her to manage and browse than a paper portfolio.”

The use of ePortfolio™ for professional development

Our own work on campus with teacher education students has demonstrated that electronic portfolios do far more than provide a convenient means of storing information (Achrazoglou, Anthony, Jun, Marshall, & Roe, 2002). A review of the participating teachers’ ePortfolios revealed that some artifacts were listed across different standards and multiple paths of relationship (Figure 2). Rather than moving from one standard to another on a strictly linear path, such flexibility is evidence of the teachers’ problem-solving and critical thinking skills in selecting and linking their performances to appropriate standard(s) (Bartlett, 2002; Holt, et al., 2001; Read & Cafolla, 1999; Ring & Foti, 2003).

As reported in Wiedmer (1998), teachers in this study who reviewed professional accomplishments using their ePortfolio™ also cited an increased confidence in their professional practice and an overall improved sense of

personal empowerment. One participating teacher commented on the role of ePortfolio™ as an integral and reflective means to enhance her professional growth:

Because of the ePortfolio™, I reflect upon everything I do in the classroom. I frequently go in and change, update and add better examples. It makes me a better teacher. My mentor is now starting to collect items for an ePortfolio™. I can see through my mentoring logs how much we talk about new materials and strategies and how these tie to standards and, of course, how students learn. It adds to my professionalism as a teacher.

ePortfolio™ templates help teachers organize teaching materials

While paper portfolios allow demonstration of materials on a strictly linear path, the hypertext properties of electronic portfolios provide multiple points of connection across standards, thus showing the interconnectivity of work. One teacher in this study stated this multiple-connectivity as the greatest benefit of using the ePortfolio™ to demonstrate her successful teaching:

The templates provided by the University of Iowa’s ePortfolio™ team have helped me assem-

ble my teaching portfolio in an organized and efficient manner. One of the greatest benefits of the ePortfolio™ is the ability to link an artifact to several of the forty-two criteria. One artifact that supports successful teaching can be used as evidence supporting several of our state's forty-two criteria.

Read and Cafolla claim that creating professional portfolios requires pre-service teachers to "engage in self-reflection as they select performance items for their portfolios" (1999, p. 99, quoted in Holt, McAllister, & Ingram, 2001). When a portfolio framework is aligned with state or national standards, it becomes an efficient tool for teachers to identify and organize evidence that they have met those standards (Holt, et al., 2001). Furthermore, when the portfolio framework is designed to help teachers identify the interconnectivity of teaching performances in a variety of classroom situations, it also fosters a deeper understanding of teaching standards and their competency as a successful teacher. About 90% of teachers in this study reported that their understanding and knowledge of the standards increased after the ePortfolio™ training.

Conclusion

As there is a rational connection between school improvement and teacher performance, policy makers and educational stakeholders have been searching for a systematic way of teacher evaluation that leads to teacher improvement and eventually to high teacher quality (Stronge, 1997). The findings of this study support that the ePortfolio™ framework promoted a meaningful conversation between teachers and administrators during formative and summative evaluations.

Despite the technical challenges and the time necessary to make an ePortfolio™, a majority of teachers and administrators in this study indicated that creating an ePortfolio™ was both a positive and productive experience in their evaluation process. Many administrators have readily embraced the use of a standards-based

ePortfolio™ as a means to evaluate early-career teachers as required by legislation. However, little research has been reported about administrators' experiences and responses to the use of electronic portfolios compared to paper portfolios during the evaluation of early-career teachers. There is a need to investigate the differences between paper and electronic portfolio usability, perception, and composition to see how these areas affect the evaluation process. Additionally, the unique characteristics of electronic portfolios, such as the ability to create multiple links between documents, the ability to incorporate various media formats including audio and video, and the ability to conduct synchronous evaluation and document editing should all be brought to bear on the conversation of ePortfolios in the evaluation process.

The extent to which an ePortfolio™ will have a positive impact on teacher quality depends on both the teacher and administrator involved in the evaluation process. The teacher demonstrates best practices by the selection of and reflection on the ePortfolio™ artifacts. The administrator then gives meaning to the ePortfolio™ embedded in the broader context of teacher professional growth by offering critical analysis and feedback to the emerging teacher.

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