

# Developing a Large-Scale, Web-Based, Professional Electronic Portfolio System: The Purdue Electronic Portfolio (PEP) System

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**Abstract:** Electronic portfolios offer a powerful tool for students to demonstrate mastery of performance-based standards. Purdue's School of Education developed a large-scale, web-based, electronic portfolio system, which relies on a web-based interface to a database in Microsoft's SQL Server hosted on a large server. The system allows students to store files and create artifacts, which are coherent collections of files coupled to reflective narratives that address specific standards. The system provides templates, which give users flexibility while providing ease-of-use and web pages as artifacts. The system will be demonstrated while technical and developmental issues, the results of pilot testing and current implementation, and implications for professional portfolios in other fields will be discussed.

## Description

The national movement toward performance-based standards for teacher education has prompted considerable interest in the use of portfolios by pre-service teachers to document their knowledge and teaching performance (Barrett, 1999; NCATE, 2000; Read & Cafolla, 1999). Portfolios are purposeful collections of student work that demonstrate effort, progress, and/or achievement (Barrett, 1999; Russell & Butcher, 1999). They are relevant to the student, individualistic, and can show growth and development over time. They provide an opportunity for the pre-service teacher to demonstrate and organize his/her understanding of teaching and learning. They provide a richer picture of that understanding than can be achieved through more traditional, objective measures. Of course, they also provide one means by which pre-service teachers can be assessed.

With the powerful personal computer systems now available, much of the interest in portfolio development is now focused on the use of electronic portfolios (Barrett, 1999, 2000, 2001; Read & Cafolla, 1999). Electronic portfolios offer several advantages compared to their paper-based analogs, including: reduced storage demands, ease of back-up, portability, ability to create links, and development of students' own technology skills (Barrett, 2001). In the context of developing pre-service teachers' own technology skills, electronic portfolios have the potential to help address the shortcomings of teacher preparation with regard to the use of technology that have been noted in a number of national reports (e.g., Moursand & Bielefeldt, 1999; Office of Technology Assessment, 1995).

After five years of reform planning by its faculty and administration, the School of Education at Purdue University is now engaged in the implementation of completely restructured elementary and secondary teacher education programs. These new programs, which were launched with students entering teacher preparation programs in the fall of 1999 and will be fully implemented during the spring of 2002, feature a cohesive set of courses and practical experiences that are anchored by four strands – technology, diversity, field experience, and portfolio assessment.

A Preparing Tomorrow's Teachers to use Technology (PT3) implementation grant, entitled P3T3: Purdue Program for Preparing Tomorrow's Teachers to use Technology, is helping to support the implementation of these new programs. The overall goals of the P3T3 project are to (1) prepare pre-service teachers to demonstrate fundamental

technology competencies, using technology as a tool for teaching/learning, personal productivity, communication, and reflection on their teaching, and (2) prepare teacher education faculty in Education as well as colleagues in Science and Liberal Arts, to teach pre-service teachers in technology-rich environments, modeling approaches that future teachers should use themselves.

The project is meeting its goals via several complementary components: (a) a faculty development program leading to increased technology integration into teacher education courses; (b) the use of technology-enabled field experiences to link pre-service teachers to diverse and technology-using classrooms; and (c) development of a dynamic assessment system that provides pre-service teachers the tools and opportunities to select multiple ways of viewing their evolving teaching practice, reflect on that practice, and use digital representations to meet performance-based assessments. The latter is the focus of this paper.

Electronic portfolios can be created using generic off-the-shelf tools or through a customized system (Barrett, 2001). Each approach has advantages. The use of generic tools has a low infrastructure cost but a high cost in training users. Such systems really encourage students to develop their own technology skills and provide considerable flexibility. On the other hand, a customized system, such as one based on a centralized database of student records, is likely to have higher infrastructure costs but lower training costs. Such a system may limit flexibility and students' skill development.

Purdue University, as part of its P3T3 initiative, is developing a large-scale customized electronic portfolio system. The rationale for this approach lies primarily in numbers. There are about 2300 pre-service teachers at Purdue. In order to accommodate this volume of students, and provide for reasonable consistency in how students and faculty deal with portfolios, a large-scale system with a consistent interface is necessary. However, the e-portfolio system that is being constructed is also designed to help overcome some of the shortcomings of customized portfolio systems, such as limited flexibility. Features being designed into the system provide users with options, while maintaining a consistent look and mechanisms for access.

The Purdue Electronic Portfolio (PEP) system consists of a database developed using Microsoft's SQL Server, a popular web-based database engine. Access to the database is provided through web pages that use Microsoft's Active Server Pages (ASP) technology. This allows for dynamic interaction with the database through a simple-to-use web front end that is familiar to users. The entire system is hosted on an in-house IBM server with nearly two terabytes of storage space. This is adequate to give each user the equivalent of a CD-ROM's worth of personal storage.

Students log in to the PEP system using their standard campus login names and passwords. Once in the system, they can manage their own account information, upload files, perform various other tasks, and create artifacts. The latter is the heart of the system. In our parlance, an artifact is a collection of files that the student assembles in the e-portfolio system to address one or more standards. Students may classify artifacts according to three broad themes, developed by Purdue's Portfolio Task Force, and according to the ten INTASC principles that undergird many teacher preparation standards.

To display the artifact, the PEP system features a set of templates from which students can choose. These templates allow students to integrate a reflective narrative with links to various files that relate to the specific artifact (e.g., a written lesson plan, guidelines from the course in which the lesson plan was created, a digital photo or even video of the lesson being taught). The templates provide flexibility in determining how the artifact will look, while providing consistency and ease-of-use. Once completed, the artifact is "published" as a web page with links to the integrated files. Student who are knowledgeable about web page development can bypass the templates altogether to create their own artifact designs.

Pilot testing of the PEP system was conducted in the 2001-2002 academic year with students in Block I and Block II of the teacher preparation programs, a total of about 800. Full implementation is currently in effect as of Fall 2002.

The presentation will demonstrate the PEP system and share data gathered from the pilot testing during the 2001-2002 academic year. In addition, technical and developmental issues, issues related to the current implementation which is required of all new teacher education students, and implications for development and adaptation of professional portfolios to other fields will be discussed.

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