

Webfolios: A Meaningful Framework for Developing Instructional Technology Skill and Subject-area Knowledge Simultaneously

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The Practice

Pre-service teachers work in groups twice per week to create individual webfolios--portfolios of linked webpages that demonstrate their knowledge of specific education topics and of instructional technology, as well as demonstrating their ability to use the technology effectively. Students form teams and work together on a topic commonly considered in a public school subject area. They use technology to design resource web pages on the topic, to create a desktop published brochure on their topic and to prepare a class presentation integrating video, web pages and/or presentation software. The webfolio and related classroom activities provide authentic opportunities for pre-service teachers to integrate technology into their own instruction and to learn basic skills for technology use. The evolving webfolios are stored in a shared drive so that all sixty students have access to each other's files. This sharing of information is essential for collaborating on projects and engaging with the thoughts of classmates.

The students are provided with a [description of required webpages](#) for their completed webfolios. The requirements fall into five categories which are also major divisions for instruction within the course:

1. The provincial views of technology use in education.
2. Resources on the Internet that are specific to the particular subject area chosen.
3. An instructional plan for integrating technology into a classroom, and a design of a classroom layout for technology integration.
4. The use of technology to meet students' diverse learning needs.
5. Ethical issues of technology.

The webfolio and the classroom activities that support its preparation provide a meaningful context for learning about instructional technology in the sense that the preservice teachers find the results of their work immediately useful in their own teaching. Examples of the technology skills learned in the context of various activities leading up to the webfolio can be seen in the following chart:

Process/Activity	Skill
Investigating the technology policy of provincial education departments	Internet searching, web page creation
Creating brochures for subject-area topics taught in public schools	Word processing, desktop publishing, scanning, graphic images, digital camera
Generating a bibliography of appropriate internet sites for a particular subject area	Internet searching, web page creation, word processing, graphic images
Preparing a classroom design for integrating technology	Scanner, digital camera
Preparing a lesson or unit plan that would integrate technology into the lesson and presenting the plan to the class	Presentation software, video production, desktop publishing, digital camera, scanner, web page publishing, Internet searching
Developing a policy for ethical and equitable use of technology	Internet searching, web page design

Guiding Principles Behind the Practice

1. The webfolio project is based on the premise that a focus on technical skills independent of a meaningful context will not be effective (Handler & Pigott, 1994; Wetzal, 1993 cited in Vannatta, 2000).
2. Students working in collaborative teams on authentic tasks, integrating technology into meaningful contexts is an effective way to develop basic skills for using technology while keeping the focus on its use to enhance learning.

Sources of Inspiration or Influence for the Practice

Constructivist pedagogy based on my understanding of John Dewey (1938) and, later, Jerome Bruner (1966) serves as a frame of reference for the development of this course. Similar ideals held by those focussed on technology (Papert, 1980), (Collins, Brown And Newmann, 1989) helped support my belief in the value of experiential learning. Most recently *Computers in the classroom: mindtools for critical thinking* by David Jonassen (1996) has focussed me on the support of learning through technology. As Xerox Parc alumnus, Mark Weiser (1994) says of the computer, in particular, "you focus on the task not the tool." Working toward this end in collaborative teams is an offshoot of the constructivist pedagogy. Having experienced working as part of a collaborative teaching team (Aquinas: Truth in Society) I have learned the value of sharing and learning from one's colleagues and students. Pre-service teachers, through collaborative work, have benefited from this same experience.

A third element that I integrated into the course was the electronic portfolio. Portfolios of student work are used in one form or another from kindergarten to graduate school. Wolf (1996) defines a teacher portfolio as "a collection of information about a teacher's practice. It can include a variety of information, such as lesson plans, students' assignments, teachers' written descriptions of their instruction and formal evaluations." Doolittle (1994) sees the portfolio's function as to demonstrate knowledge and skills in teaching -- to show the teacher's talents. The webfolios prepared in this course have aspects of both student and teacher portfolios. Previous offerings of the course had included elements of constructivism and collaboration, but the technology portfolio had always been on paper. The addition of the webfolio was inspired by the requirement of the Western Carolina University teacher-education programme that students prepare a technology portfolio and by the suggestion that it be web based.

Frequently Asked Questions About the Practice and Responses

1. Do students with no computer experience in web page creation become anxious when they realize they have to create an electronic web portfolio?

There usually is some initial anxiety among students without technical experience but they very quickly become involved with their peer group and learn with and from them. Guided assistance is also offered through tutorials. Usually students only require one session and often it is these students who, by the end of the course, are the strongest advocates for the integration of technology into teaching.

2. **What software applications do your students have available to create their portfolios? Have you found some applications better than others for your purposes?**

The students have access to the university computer lab which is reserved during class time. The lab is also reserved for an additional hour each week. The university provides Corel Suite (WordPerfect, Corel Presentations, Quatro Pro) so students use only those tools and Netscape editor. I have chosen an HTML based portfolio because of its ease of use, the ability to update files on students home computers and its transferability to other systems.

3. **Is collaboration an essential feature of webfolios?**

No, the students could create and benefit from the experience as individuals. Students could create the webfolio, as is done in Western Carolina University, as a self-paced-activity. One valuable feature of the collaboration is the shared knowledge of technical skills as well as the opportunity to be involved in authentic learning activities such as the class presentation and design of lesson plans as a team.

4. **Do you take any particular steps to insure that workloads or contributions are fairly equal among group members? What if the group-based process doesn't seem to be working for a particular group?**

The groups are formal learning groups (the same group working over the term on a project) and the students self-select their teammates. Membership of a group may range from two to five students. This flexibility in the creation of groups tends to avoid difficulties with the group-based process. The education programme at St. Thomas University is very collaborative so students in this course also work in groups in most of their other classes. They know which students they work best with by the time they choose their team. The group project develops sequentially over the term with deadlines along the way. This process seems to keep groups from floundering and keeps the workloads balanced. Time is provided in class for groups to meet, organize and discuss their progress and any issues that arise. Students are accountable for their own individual portfolios, and most see the group as a great way to learn and develop technical skills. Johnson, Johnson & Smith (1998) consider the success of Formal Learning Groups to rely on five significant factors, which include interdependence of members and individual accountability.

5. **How are the webfolios evaluated?**

The assessment of the webfolios, as in most of our core courses in the education programme, is on a pass/fail basis. Students are expected to meet a minimum criteria and they must meet the criteria before completing the course. Progress of the group project and individual webfolio entries is tracked at certain points through the completion of the class project. The group presentations are evaluated using a simple rubric. The evaluation of the worth or merit of the projects is done by both instructor and peers.

For More Information (References and Links)

1. Bruner, J. (1966). *Toward a theory of instruction*. Cambridge, MA: Harvard University Press.
2. Collins, A., Brown, J.S., and Newman, S.E. (1989). [Cognitive apprenticeship: Teaching the crafts of reading, writing, and mathematics](#). In L. Resnick (Ed.). *Knowing, learning, and instruction: Essays in honour of Robert Glaser* (pp. 453- 495). Hillsdale, NJ: Lawrence Erlbaum Associates.
3. Dewey, J. (1997). *Experience and education*. New York: Simon & Schuster/Touchstone. (Originally published in 1938).
4. Doolittle, Peter, (1994). [Teacher Portfolio Assessment](#). *Practical Assessment, Research & Evaluation* [On-line], 4(1).
5. Johnson, D.W., Johnson, R.T. & Smith, K.A. (1998) [Active learning: Co-operation in the College Classroom](#). Edina, MN: Interaction Book Company.
6. Jonassen, D. H. (1996). [Computers in the classroom. Mindtools for critical thinking](#). Englewood Cliffs, NJ: Merrill.
7. Vannatta, R. A., Beyerbach, B. (2000). [Facilitating a constructivist vision of technology integration among education faculty and preservice teachers](#). *Journal of Research on Computing in Education*, 33 (2), 132-148.
8. Weiser, M. (1994). [The world is not a desktop](#). *interactions*, 1 (1), 7-8.

9. Wolf, K. (1996). [Developing an Effective Teaching Portfolio](#). *Educational Leadership*, 53, 34-37.

My source for the idea of a portfolio of technology projects can be found on this [Western Carolina University](#) web page.

For a look at the course outline and the criteria for the webfolios and collaborative activities see my [course web page](#).

Examples of completed portfolios are available at the following links. [Shannon Mullin's](#) personal portfolio includes a project on cave art for elementary students completed with her partner, Michelle Sharp. [David Meagher's](#) personal portfolio includes the project he worked on with Carrie Hunter-Cruz which is about the Internment Camp Museum in Minto, New Brunswick. [Christa Manuel's](#) personal portfolio includes the social studies project on Egypt which she completed with Lisa Sheppard and Nicole Doucet. [Brent Jewett](#) completed a portfolio and a project on Water Treatment with partners Amy Cook and Heather Sisk.

For my experience as part of a collaborative team see the 1995 course site for Aquinas section of [Truth in Society](#).

For further information on group process see the [web pages on group work](#) from Teaching and Learning Services, Lincoln University, Canterbury, New Zealand.

[Discussion of the works of Jerome Bruner](#) as they relate to constructivist pedagogy.

[Synopsis of the cited book by John Dewey](#).