Alternative Assessment: Electronic Portfolio

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Abstract
This paper presents the development of students' electronic portfolios. Electronic Portfolios are incorporated into the course curriculum at the Department of Technological Studies at Ohio Northern University as both alternative assessment tool and as a hybrid assessment tool. Students document their course work using software applications such as MS PowerPoint, and Hypertext Markup Language. They utilize digital media such as scanner, digital camera, microphone, and other means to assist them in preparing the documentation of electronic portfolio. Students are often required to conduct self-assessment by adding descriptions on what they have accomplished through out the course. The final product can be presented in various formats such as a CD-ROM, or online. This product can be used as an evidence of students' work and in turn can be linked to course outcomes and to program objectives for assessment. As a result, professors perform minimal work to tie students' work to the departmental metrics.

Introduction
Educational assessment has experienced a tremendous change. In comparison to traditional assessment such as objective test, alternative assessments are often suggested to educators for better evaluating students' performance. Various alternative formats such as peer/self evaluation, rubrics, laboratory-based practical evaluation, projects, and portfolios are often used as a mean for alternative assessment. Portfolio, a systematic and organized collection of students' work over time, is a powerful method for educators to evaluate learner's performance in a given subject. Shackelford [6] defined that "a student portfolio is a purposeful collection of materials capable of communicating student interest, abilities, progress and accomplishments in a given area."

Electronic portfolio provides the same advantages of regular portfolio. Electronic portfolio is defined as the container which allows learners to collect their work using various types of media such as audio, video, graphics, and text, and using hypertext links to organize the materials to demonstrate the evidence of learning outcome. Electronic portfolio allows educators the opportunity to evaluate the process of portfolio development and end product using hypertext and electronic media [3]. Mason, Pegler and Weller [7] reported that e-portfolios have several advantages for each of the developmental stages: collection, selection, reflection, projection, and presentation. The advantages are identified as:

- It is easier for learners to reorganize or reorder the content.
- The process of gathering materials for e-portfolio helps learners' knowledge through making sense of concrete learning.
- E-portfolio helps learners in particular during the developing process where collaboration with peers and teachers occurs.
- E-portfolio offers multimedia presentation possibilities including graphics, video files, audio files, and references to external sources.

- Less physical space is required in comparison to the traditional portfolios.

Tillema [4] identified three types of portfolios: the performance dossier portfolios, reflective learning portfolios, and course-related learning portfolio. Shackelford [6] identified four types of portfolios: Showcase, descriptive, evaluative, and composite portfolios. Tillema [4] reported in his study that reflective portfolio is an especially effective assessment tool, and many had reported positive effect of using such alternative assessment. No matter what type of portfolio educators decide to incorporate into the course for assessment, they need to identify the purpose of such assessment. Hebert [1] discussed the purpose of portfolio and pointed out the difference between the use of portfolio as assessment of learning and the use of portfolio as assessment for learning.

This paper presented the development of electronic portfolio. Two levels of development are described, one at course level which created by students enrolled in that course, and another at program level created by senior level students which are the collection of the work throughout the program. Assessment implementation followed. Finally, students' comments on electronic portfolios are presented.

Development of Electronic Portfolio - Course Level

Electronic portfolio was incorporated in all core courses at The Department of Technological Studies at Ohio Northern University. Students are required to create their e-portfolios during or at the end of the course. Electronic portfolio serves as a formative evaluation during its process of development. Students gather materials through the use of scanner, digital camera, audio recording, and video recording. Learners then compile the materials using hypertext. Using Tech 342 Electronic Media Design and Development as an example, formative evaluation was used to assess students' skills in XHTML unit. Students are required to submit a CD-R which contains all files created in and out side of class time for evaluation. Such portfolio is used for assessment during the academic quarter. Students receive feedback from the instructor and modify their portfolios according to the suggestions for continuous improvement. A project outline is shown in Figure 1.

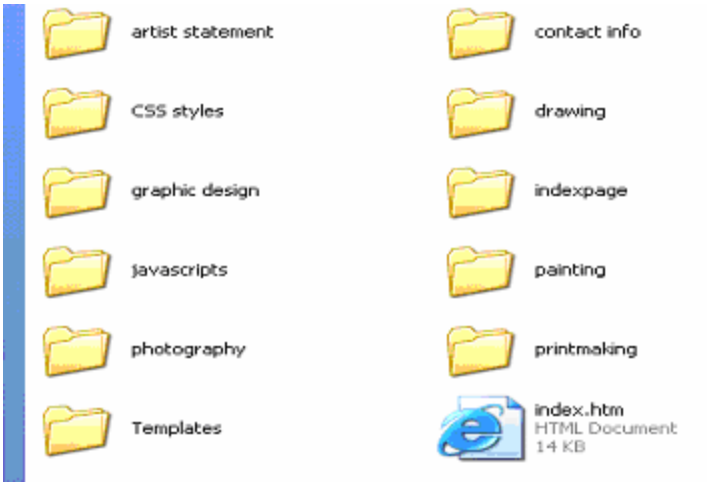

Figure 1 Project Outline Sample

Another example is electronic portfolio created in TECH 139 Introduction to Information Systems. Summative evaluation is conducted using descriptive e-portfolio to gather materials for assessment. Using MS PowerPoint, learners follow the criteria as shown in Figure 2. This portfolio documents learners' course work throughout the quarter. Documentation includes hyperlinks to assignment files, exam files, screen shots of sample works …etc.

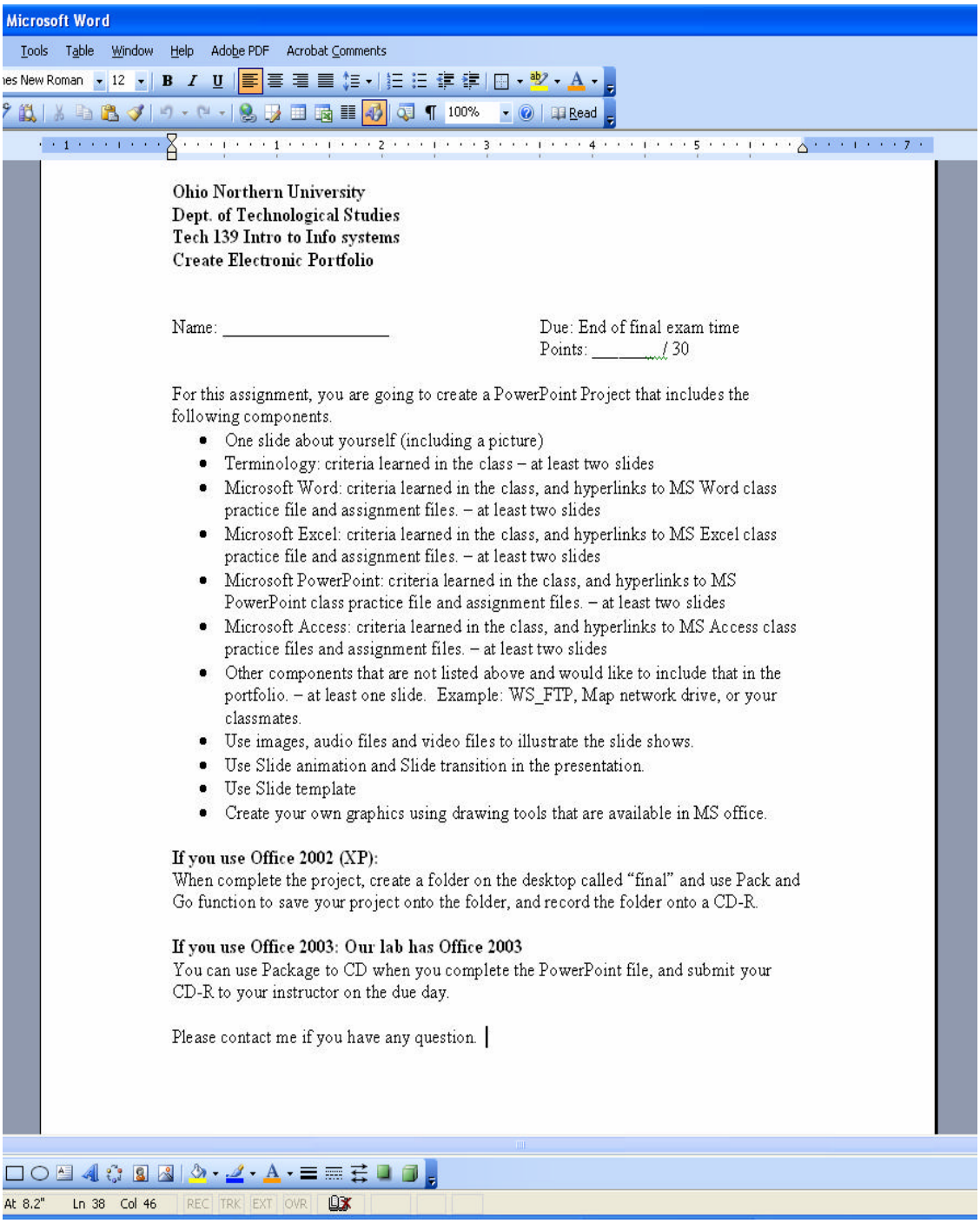

Figure 2 Course Assignment Sample

Using the descriptive portfolio approach, unintended learning outcomes are often found in the electronic portfolio. As shown in Figure 3, a student had described what he had learned in MS Excel unit based on his perceptions. The items documented in the portfolio differ from one student to another although the course objectives are the same.

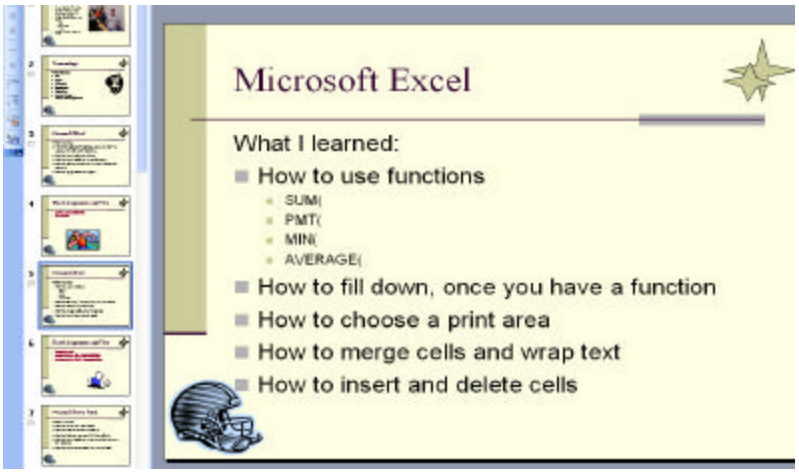

Figure 3 Student Self Assessment of Course Objectives

Development of Electronic Portfolio – Program Level

Students in the department documented their course work electronically for all courses. During the senior year, they have the opportunity to compile all the electronic portfolios into one. Templates are created by the author, and made available at the university network drive where students have access to view the sample files. They authorized with the privilege to copy and to customize the templates to their own need. Figure 4 shows one of the accessible templates on the university network for students to fill based on course level; Freshman, Sophomore, Junior and Senior.

Figure 4 On-Line Template Sample

Students can customize their portfolios into various ways through the use of the template. A senior student, Josh Prowant, had modified the categories from year level to skill areas such as Business Administration, Construction Technology, Information Technology to name a few. This is shown in Figure 5. Each course title is also a hyperlink which is linked to the course electronic portfolio that he had created.

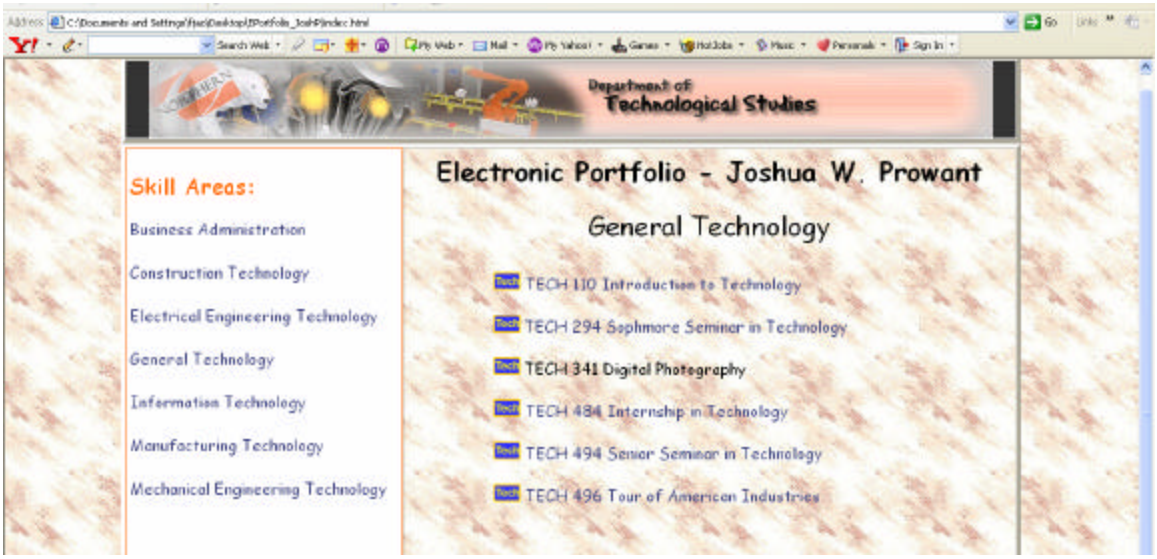

Figure 5 Sample of a Student Customized Template

Erik Nufer, another senior student who prefers to use the template just as a guideline. He created his e-portfolio using MS PowerPoint. A sample slide is shown in Figure 6. Erik listed several main areas of his work, and created links to the electronic portfolios for each area. For instance, when clicking on the hyperlink "Product Manufacturing", it takes the viewer to another PowerPoint file which shows sample works of the related subject as shown in Figure 7.

Figure 6 Sample of a PowerPoint E-Portfolio

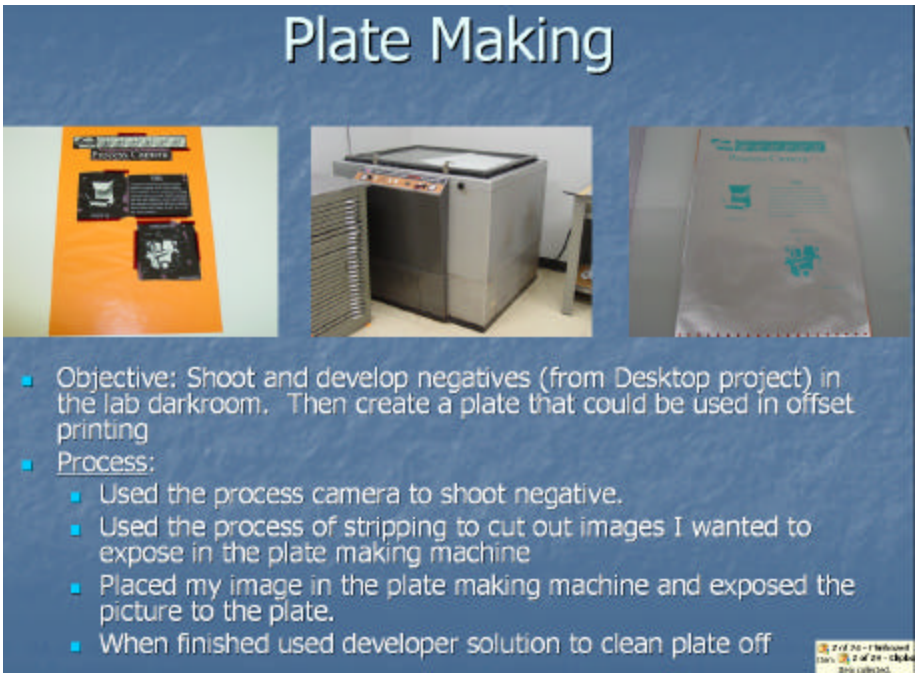

Figure 7 Student Sample Work in a Course

In addition to assessment purposes, using materials gathered for their electronic portfolios, students can create showcase portfolio for targeted employers. Showcase portfolio as described by Shackelford [6], contains the best projects from all the sample works. The developing process of electronic portfolio in students' college years helps them not only with continuous improvement but also becoming ready for the preparation of showcase projects to prospective employers.

Assessment Implementation

The Department of Technological Studies at Ohio Northern University is accredited by the National Association of Industrial Technology (NAIT). The NAIT accreditation process is similar to ABET's. Program objectives should be established, course outcomes that support the program objectives must be clear. The department developed metrics to assess the program objectives and which course supports which objective.

A hyperlink to the list of program objective is provided in the self study report. As an example suppose that there are a total of six objectives. These six objectives are listed and as an example one objective stated as "ability to utilize appropriate technology and use modern tools for a given situation." The viewer clicks on its hyperlink, it will take him to the related metrics. Each metric is hyperlinked to the courses that support it. In the course, students' works are presented from their portfolios. Doing this through students will engage them in the assessment process and show them that their works are very important not only for grade purposes but also for the department as a whole.

Conclusion

Electronic version of portfolio in particular serves not only for assessment purposes but also for presentation of achievement purposes. This alternative assessment method provides an excellent factor for educators to assess skills which are hard to measure; Moreover, the process of developing it provides students with a significant learning experience through collaboration and self-evaluation. As commented from one of the senior students, Adam Miller:

> *"It is a great way for viewers to see what I did in my classes. Personally I like to create them, because I feel they are a good way to wrap up all of the work that I put into a class. I think that electronic portfolios are a great idea because they are a summative assignment that doesn't require a lot of extra work."*

Although the process and development of electronic portfolio are considered an excellent alternative assessment, it is suggested to investigate learners' perceptions toward this method of assessment and modify course curriculum to best serve the need of our learners.

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Author Biography

Dr. Feng Jao obtained her PhD from the University of Toledo in the field of Educational Technology in 2001. Currently she is an assistant professor in the Department of Technological Studies at Ohio Northern University. Her professional interests include integration of instructional technology across curriculum, software training, digital media, and web-based instructional material design and development. Dr. Jao holds several certifications including Microsoft Office XP Word 2002 Expert, Office XP Excel 2002 Expert, Office XP PowerPoint 2002 Comprehensive, Office XP Access 2002 Core, Office XP Outlook 2002 Core and WebCT. She is an active member in AECT and ITEA professional organizations. Dr. Jao is listed in the International Who's Who of Professional Management.