

# **Designing an electronic portfolio system for a large research university in Asia.**

**Ivy Tan**  
**National University of Singapore**  
**Center for Instructional Technology**  
**cittani@nus.edu.sg**

## **Abstract**

The National University of Singapore implemented an e-portfolio system in February 2003. This presentation will discuss design and deployment issues for e-portfolios in a large Asian research university. Each university has its unique culture, constraints, and needs. Culture, university enrollment, and priorities affect the design and application of e-portfolios.

## **1. Electronic Portfolios and its place in higher education.**

The use of e-portfolios is quickly gaining momentum in many universities. The e-portfolio focus session of Educause's National Learning Infrastructure Initiative in October 2002 revealed that many vendors such as Blackboard, Webct and McGraw Hill either have e-portfolios or are in the process of developing one. Educators in the Pacific Northwest, through the Northwest Evaluation Association (1990), developed the following definition of a portfolio: "A portfolio is a purposeful collection of student work that exhibits the student's efforts, progress, and achievements in one or more areas. The collection must include student participation in selecting content, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection."

Gibson and Barrett (2002) identified two approaches to developing e-portfolios. The first, they call generic tools approach or GT and the second they call the customized systems approach or CS. The GT approach uses tools such as word processors, portable document format (PDF), HTML editors and authoring tools to create an electronic portfolio stored in electronic media such as CDROMs, diskettes, videos tapes or DVDs. The CS approach is an information system that allows students to create and display a portfolio online. Information is stored in databases. This paper focuses on the customized systems approach to building e-portfolios.

## **2. Why build our own e-portfolio system**

### **2.1. The Centre for Instructional Technology.**

The Centre for Instructional Technology (CIT) at National University of Singapore (NUS) was set up in 1998 with a mission to research, design, develop, support, promote and demonstrate the use of cutting edge technology in teaching and learning.

### **2.2. The existing Learning Management System.**

The CIT developed its own learning management system (LMS) known as the Integrated Virtual Learning Environment (IVLE). This LMS has sophisticated tools for student assessment as well as peer to peer evaluation. The IVLE is the main focus of the CIT and it contains a grade book which lecturers use to enter final and continual assessment marks. There is also a mechanism for tracking of student progress in the IVLE. CIT felt that the e-portfolio system should be integrated with the LMS. There is no need to duplicate existing LMS features. Moreover, the user and graphical interface of the e-portfolio must be

consistent with that of the LMS. The CIT has for the past five years worked very hard to encourage faculty use of the LMS. To date, more than 95% of all course modules are on the LMS. The e-portfolio will be launched through the LMS. Eventually, the e-portfolio must be seamlessly integrated with the e-learning infrastructure of the university.

### 2.3. Database Integration.

Users of the e-portfolio should not enter data that is already available on student databases. Back end integration of databases will not be easy and the process might be on going for a few years. The CIT was concerned with the cost of integration and maintenance if we had bought an existing system either from another university or from a commercial vendor.

### 2.4. Uncertainties.

At the time when research started on e-portfolios, the CIT was not sure of the future directions of e-portfolios. There were concerns that if we were to jointly develop a system with a group of American or European universities, the group might decide to develop a system that would not fit into the Asian context. We were mindful of implementation challenges from the start.

## **3. Designing an e-portfolio system for a Large Research University in Asia.**

### 3.1. Mission statement of SELF.

The main objective of the SELF is to allow students to collect samples of their work which indicate learning. Over time, these artifacts become their portfolio. Students are able to publish these artifacts in their electronic resume when they graduate. It is hoped that the process of self reflection and portfolio building will make students become aware of their own progress towards goals. They will learn how to take charge of their own learning, set goals and work towards them.

### 3.2. The design: Concerns and solutions in the Asian context.

The National University of Singapore is a research university with more than 30,000 students and about 1800 faculty members. Students come from various parts of Asia. Students are tech savvy. Little training was required for students to use the LMS. Other software launches had been successful without extensive training. Faculty members come from all over the world, most of whom obtained their doctoral degrees in Western countries. Extensive workshops have been conducted to train faculty members in the use of the LMS.

The SELF is integrated with student databases across campus and the LMS. In SELF, students write reflections, collect work samples (artifacts) and record special awards in the following areas: Academic Courses, Exchange Programs, Special Projects, Co-Curricular Activities, Industrial Attachments, Part Time Employment, Full Time Employment, Community Service, National Service, Previous Schools and Personal Information. The detailed data fields or information captured in the SELF was guided by: 1.) IMS learner information package, version 1.0, information model specification. 2.) Vital information that is required to demonstrate the skills, knowledge and abilities of our students. 3.) Information captured by other similar programs in other universities.

In the design process, several worries plagued the mind of the designer. The first major concern was the concept of "Reflections". What are reflections? What is being reflected? Who writes reflections? Who reads them and how are they useful in the learning process? Singaporean students have no experience in writing reflections. If lecturers can read these reflections and respond to them, students will write positive reflections. The Asian student will not write critical comments unless lecturers specifically encourage students to do so. Although this is increasingly being practiced, students will hesitate to write true remarks. If reflections do not contribute to improving grades, students will not be motivated to spend time reflecting. Students believe that writing reflections that are not in line with the professor's views and

believes can be risky. In view of these factors, the team will not make reflections the center piece in the e-portfolio. However, the design team is very keen to make the e-portfolio a tool for reflections and will develop a plan to educate students and lecturers on the writing of reflections and its value. This process will take many years.

Another major concern was the collection of artifacts. In the SELF, all artifacts relating to academic modules or courses must have been graded by a lecturer before it is uploaded as part of the student's portfolio. Students need to write a summary of the assignment and explain why they consider the work to be exemplary of their achievement. In Asian society, students may not feel comfortable with this because professors can view and write comments on these self proclaimed achievements. Asian students tend to be very modest with their strengths. Students have no experience in self evaluation of their own learning, they have been assessed by teachers throughout their student career. With the exception of some students in certain fields of studies, most students have not been taught how to collect artifacts.

To encourage the collection of artifacts, artifacts are named "Assignments. Projects. Artifacts" in sections related to academic studies. The term "Achievement" is used in sections not related to official academic studies. Help screens denoted by a question mark are placed in various sections of the SELF to explain the rationale of collecting artifacts. The CIT will promote the practice of collecting artifacts and building a portfolio because this is important to students, staff and the public. In our social and economic context, evidences of achievement and skills are important.

The term "Resume" was also a cause for concern during the design phase. The resume builder allows students to publish their portfolio in the form of an online resume along with artifacts and lecturer's comments. While students know what an electronic resume is, most do not yet understand the concept and purpose of an e-portfolio. There is a danger that students might use the SELF as another resume builder. The CIT understands that what matters to students is the ability to display their work and create a nice resume. This will encourage students to use the new system. The CIT would allow students to use the SELF as a resume builder for a start. The design team has created attractive online Flash multimedia user guides to explain the concept of e-portfolios. These user guides is complete with audio and animations and they are prominently placed in the SELF where students can access.

The Learning Path in SELF enables students to set career goals, read their reflections, read lecturer's comments and manage uploaded artifacts. Students are required to think about their actions and decisions. They become responsible for their own future. However, creating this culture will not be an easy. The school system "tells" students what to do and what not to do. Career paths and lives are pre-planned by parents, teachers, society expectations and life circumstances.

### 3.3 Online assessment and evaluation: A paradigm shift.

Through the SELF, lecturers have access to information of students enrolled in their classes for the current semester. They have access to all artifacts uploaded by their students. They can read reflections and respond to them. The SELF is being integrated to the assessment features of the LMS.

Assessing and evaluating individual students online is uncommon in a traditional research university. The student assessment features in the LMS are not widely used although they have been available for at least three years and extensive workshops have been conducted to encourage their usage. In a research university, faculty members have research duties in addition to teaching. A professor can have as many as 400 students in a class. The participation of lecturers must be strictly voluntary. Online assessment methods require a huge paradigm shift.

### 3.4. Challenges in a large, traditional research university.

In addition to teaching, faculty members in a research university are required to focus on research and publications for promotion and tenure. The use of teaching technology cannot add to the workload of faculty members. Classes in the NUS can have as many as 400 students. It is very difficult for lecturers with large classes to give personal attention to students in the classroom. It is unrealistic to expect lecturers

to use the e-portfolio for student assessment and individual course advice. The implementation of the SELF must be student driven. The design of the lecturer's interface must be simple and very user friendly. At the same time, it must not appear to be very different from the LMS because all faculty members are accustomed to that interface.

#### **4. Student comments**

Ten students were involved in the pilot testing of SELF in January and February of 2003. Four of the students were from the faculty of Arts and Social Sciences, three from the school of computing, one from the school of business, one from the faculty of law and one from the faculty of engineering. Students were required to use the system to upload artifacts, write reflections and publish resumes. They had to test the system for programming errors and they each sat for a one hour interview with the evaluator. The list of questions asked in the interview is available in Appendix A of this paper. In summary, students were asked for their understanding of the term "reflections", what they think is the main objective of SELF and which feature in SELF mattered most to them. The main objectives of this study were: 1. Find out what students think is the main objective of SELF 2. How SELF should be "marketed" to students across campus so as to encourage usage. 3. What matters most to students in SELF. 5. Student's perception of writing reflections.

Students defined "reflections" as their opinion of a course or activity, their feelings towards a course or if the course met their expectations. They did not see the need to write reflections although all admitted to reflecting in their minds. They felt that reflections are important in helping to decide which modules they should sign up in the following semester and which activities to get involved in so as to achieve their goal. However, they admit that they will not write honest reflections if lecturers can read and respond to them. One student said he would phrase criticism in a constructive and formal manner so as not to offend the lecturer. He said he will not do that if lecturers did not have access to the information. Students are afraid the writing will affect their grades. They insisted on writing reflections only after the release of grades. They insist that students must be informed that lecturers have access to the information. They did not understand why lecturers should read their reflections when lecturers are not involved in career counseling or the course selection process. Two students strongly felt that the diary is more useful for reflections because it is not accessible to lecturers. One student aptly said that student-lecturer trust cannot be bridged without a paradigm shift.

Students gave valuable feedback as to how they think SELF can be implemented campus wide. Suggestions include publicity flyers, conducting courses for new students, reward for the best resume created, integrating SELF with the learning management system, making it compulsory for students to build a portfolio and using the "Reflections" feature in SELF as the official avenue where students write course feedback at the end of each semester. The current university practice requires each student to complete a course survey before sitting for the final exams. If this is done through SELF, students are able to keep a copy of their own feedback. A collection of these feedback forms are good for long term reflections and self assessment. The student who made this suggestion laments that at the moment, he is not able to keep his feedback forms.

Another student said that SELF has to be marketed to students so that students see the benefits of using the system when they are in first year. Most students create resumes only in their final year of study. The SELF requires a systematic collection of artifacts over time. This has to be communicated to the new students through courses, workshops and distributing promotional CDROMs. He said that resumes change over time and an undergraduate's needs may be very different from that of the Alumni. Templates must be flexible and the resume builder must be constantly changed to reflect current trends and resume design. Students should be encouraged to contribute to the design of templates. If the system allows students to upload their own resumes, the developers can take note of outstanding resumes and model the templates based on those actual student uploads. His rationale was that a good resume builder will encourage usage.

What matters most to students? All students (without exception) said that “modules taken” section mattered most to them because they can see at a glance, the various modules taken in the course of their study at the university. They are enrolled in the university to pursue an academic degree and decision as to which modules to study matters most to them. All students indicated an interest in seeing their grades displayed along with the modules taken. This is currently not available. They thought that SELF is a planner and a place for them to write reflections and consolidate their learning. Two students thought that personal information section is important because they were concerned with the privacy of information. One student felt that if Alumni access is denied, the privacy and ownership rights of the student is being violated. All the students are dissatisfied with the resume builder but are optimistic that it will be improved over the next few versions. Students want to see more templates and greater flexibility in displaying information. They found the resume rigid and out of fashion with current trends. Students want to see more bright colors in SELF.

## **5. Implementation**

Students at NUS have been proven to be tech savvy. No training was required for students to use the LMS. The CIT had in the past conducted pilot testes on sophisticated computer mediated communications software and students required no training to start using these software. Publicity was also minimal. Students, especially those from the faculties of Engineering and Science were able to find their way to and around these new applications. They will on their own initiative use the tool and give feedback. If the application is useful, they will spread the news to their friends.

Version 1 of SELF was launched on February 2003 in a quiet launch without publicity. The link to SELF was placed in the LMS. Students started to explore the e-portfolio and some gave their comments. In July 2003, version 2 of SELF was launched. Brochures were printed and workshops were organized for new students. The SELF was introduced in LMS workshops for staff. Usage of the SELF is student driven and no special incentives are given to students to use the system. Most faculty members are still not aware of the existence of the SELF. No press release was made on the SELF. Several meetings were held with campus administrators to showcase the SELF so as to ensure no duplication of service and to negotiate for access to data for the purpose of further database integration.

## **6. Usage Statistics**

Webtrends web traffic analysis suggests that student traffic to the SELF is very good. Students are trying the application. As of 3<sup>rd</sup> December 2003, 765 students have used the SELF. As expected, reflection and artifact entries are low: 216 reflection entries and 160 artifacts. Faculty of Engineering had the highest number of reflection entries followed by the School of Computing. Only 29 resumes were published and they did not include artifacts. 209 resumes were created but not published. As expected, no lecturers have used the system to write comments for students. There were 561 entries in the e-diary. The e-diary can only be accessed by the student and lecturers have no access to it.

These figures are a very promising start and students are writing to the development team with suggestions. There has been minimal publicity on the SELF. The team at CIT is excited with the number and quality of reflections written in the SELF. There is no portfolio culture in Singapore. Our students have never been taught the value of writing reflections, especially reflections that can be read by professors and which will not contribute to grades.

The CIT understands why students were not publishing their resumes, the original resume template was visually unattractive. The resume builder was not flexible. A new template is now in place and the new resume builder allows for more flexibility.

## **6. Future Directions**

Evidences from interviewing the ten students as well as the current usage statistics showed that students know the value of reflections. Some are uncomfortable because lecturers have access to their reflections. But meaningful reflections require active dialogue between teacher and student. A scenario where students reflect in “secret” can be unhealthy. Reflections should be honest, open, critical, constructive and in short professional. Although restricting lecturer access could increase usage of the SELF, the team at CIT will not be doing that.

While students are tech savvy and are able to navigate about the system, the concept or rationale of an e-portfolio must be taught to both students and staff. There will be more planned student workshops. The CIT will also start lecturer driven focus groups. These focus groups will make it compulsory for students to use the SELF. For any new learning system, the university is not able to do top down implementation if usage from lecturers and students are too low.

The development team will continue to integrate the SELF with student databases and with the LMS. Students’ continuous assessment and cap scores will be made available in the SELF. New security features such as https will be implemented. The engineering team can and will implement IMS e-portfolio standards when these become available. The team hopes to include a learning style inventory in the SELF but existing online questionnaires are costly for a large campus of 30,000 students.

The university administration is extremely concerned that certain information provided by students in e-portfolios cannot be verified. The crest of the university is not used in resume template and a disclaimer message is displayed on all portfolio resumes. The CIT will be monitoring international developments in this area. The university will allow the crest to be used on published portfolios only when universities in America and Europe allow for the use of their crests on e-portfolios.

## **Bibliography**

- American Association of Higher Education. (2003). Electronic Portfolios. Retrieved on 3<sup>rd</sup> December 2003 from <http://webcenter1.aahe.org/electronicportfolios/index.html>
- Batson, T. (2002) The Electronic Portfolio Boom: What's it All About? Syllabus magazine December 2002 Issue. Retrieved 3<sup>rd</sup> December 2003 from <http://www.syllabus.com/article.asp?id=6984>
- Barrett, H. (2003). Electronic Portfolio Development. Retrieved December 3<sup>rd</sup> 2003 from <http://electronicportfolios.com/>
- ePortConsortium.Org.(2003) Retrieved on 3<sup>rd</sup> December 2003 from <http://www.eportconsortium.org/DesktopDefault.aspx>
- Stanford Learning Laboratory. (2003) E-Folio. Retrieved on 3<sup>rd</sup> December 2003 from <http://sll.stanford.edu/consulting/tools/efolio/>