# A Study of Mobile E-learning-Portfolios

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*Abstract:* - Based on the applications of e-portfolios, a mobile system infrastructure was designed with the discussion of information flow scenarios. This study intended to figure out the impacts that mobile technology has exerted on the educational system through the portfolio. To fully understand the potential impact of the mobile electronic learning portfolio system on education, institutions need to take into account the current environment within higher education. Evaluating student performances always has been an important issue for academia. This study proposed a four-step-model of mobile e-learning-portfolios. Those are steps of accumulating, revealing, proposing and publishing.

Key-Words: - Mobile learning, E-learning-Portfolio

# **1** Introduction

In this modern world where mobile technology dominates and all things communicate without hindrance, it is important that we determine what precisely we are trying to say. A mobile identity system is designed to present a specific image that is tailored to form a lasting impression on a large group of viewers. Identity systems provide guidelines and recommendations on the use of logos, word indexes[1, 6], colors, and catch phrases to users and promoters of a product or idea.

As use of the Mobile E-Learning Portfolio (MELP) increases, it is important to show a unified representation of the system across all types of media that carry the name of Mobile E-Learning Portfolio. Over time, this system will associate an image of professionalism and quality with the name of E-Learning Portfolio. This study intended to provide

the design principles with which the possible image for the MELP can be created.[2]

# 2 Conceptual Framework

An e-learning portfolio is a collection of personal information about a learner that represents accomplishments, goals, experiences, and other personalized records that a learner can present to schools, employers, or other entities. Typical uses of e-learning portfolio go beyond the traditional concept of a transcript to include self-constructed learning, applying for jobs, designing personalized learning, and tracking career planning. In this mobile age, portability and communicating are both essential ingredients of e-learning portfolios[1, 3, 7-9].



Figure 1 Conceptual Frame of Mobile Electronic learning Portfolios

In Figure 1, a mobile electronic learning portfolio is an mobile information system for cummunating information related to learning process.

# **3** Usage Scenarios

# **3.1 Personal learning story**

This is why a portfolio is important and this is what keeps it popular. A portfolio is its owner's tangible record of accomplishments, a collection of products, which tells who she/he is, and over time, becomes a record of how he/she comes to be there.

It strongly communicates what is important to a person. The mobile characteristics of being accessible anytime and anywhere become a significant value in the portfolio.

The story, namely, the portfolio, is not a fad and it cannot go out of fashion because it is always evolving with the person, at her/his pace, in her/his style. In this way, a portfolio is like skin; it always fits you and is not interchangeable with anyone else's.

We can look in a closet or a refrigerator and gather some impressions about a person, but they will be superficial. When we look into the portfolio, we gain insight about intellectual growth, mastery of skills and concepts, extent of knowledge, and strength of thinking skills. A single portfolio may show varied talents, struggle, wit, effort, and other, perhaps heretofore hidden, qualities. It is for sure that reading a portfolio is not as good as spending time getting to know someone, how he/she thinks, and what he/she can do. But the portfolio is a much richer representation of a person than just grade A, B+ or 650 Verbal, 540 Math, or the short prose of a curriculum vita, or a quick conversational sketch: he's an A+ student; she's a librarian; they live in Taipei; he went to USA.

# **3.2 Processes-Oriented**

In our experience, this is the process of a sentient being's ongoing, adapting involvement with the world, a lifelong learning process. It goes on and on in circles. Teachers call it the learning cycle; writing teachers call it the writing process; planners call it the planning cycle; marketers call it the product cycle; programmers call it the development cycle. Every discipline seems to have its own variation and vocabulary. It always involves

- Performance (trying, doing)
- Reflection (What worked well? What

flopped? How will I improve next time?)

• Adjustment (making changes and trying again). The adjustment will

range from a few tweaks, to serious

revision, to starting over

They all have the goal of moving closer to getting it right.

# **3.3 Learner Scenarios**

This scenario illustrates the very plausible story of a mobile learner who may transfer to another institution before completing her/his undergraduate education, who may continue education in graduate schools, and who, after entering the job market, may make career moves every few years. The learners are those who could access or alter information anytime and anywhere by using mobile devices.

# 3.3.1 Beginners

During the new student orientation program, beginners receive information sheets outlining campus mobile portfolio services and their accounts. They could use that information to access their courses, e-mail account, and even campus portal.

# **3.3.2 Setting up personal portfolio pages**

The portfolios management system offered by a learning institution automatically and dynamically creates and maintains a personal portfolio site for each member of the university based on the student's ID. Public information, including e-mail addresses, majors, links to one's department, etc., is available to the public.

# 3.3.3 Learning about campus principles

The learning institution recently developed and adopted some principles of undergraduate learning with the goal of enabling each student to demonstrate mobile learning outcomes with proficiency in these adopted principles of learning core communication and quantitative skills; critical thinking; integration and application of knowledge; intellectual depth, breadth, and amativeness; understanding of mobile society and culture; and values and ethics. These are presented in learners' mobile portfolio as the learning matrix, which represents how their courses, projects, and experiences are related to the principles of learning.

# **3.3.4 Dynamic collecting and reflecting on** learning accomplishments

As students write papers and develop projects, they save and store them in the electronic portfolio management system. As they save files, students elect to provide reflection notes to indicate what they have learned or how they have progressed by completing the assignments. Each paper or file becomes associated with meta-tag information, including student reflection, the data created, course association, project grade, course instructor, correlation between the principles of learning and learning outcomes. The portfolio management system dynamically imports major projects submitted and assessed through the course management system. Once such a document is automatically imported from the course management, it is locked and cannot be modified. This feature offers the certification and verification that the imported document is the one submitted by students to their professor.

#### 3.3.5 Students meeting academic advisors

Students would meet their academic advisor to review their coursework and make sure they are progressing effectively. During the meeting, the academic advisor could log into the electronic portfolio management system to authorize substitutions of courses in the learning matrix. The academic advisor is reviewing learners' outcomes to verify if their academic advancement is in accordance with the learning institution's principles.

#### 3.3.6 Part-time working resumes

Based on basic information, the mobile electronic portfolio offers the opportunity to create a resume. Students may want to look for a part-time job to help pay school expenses. They could create a resume and include links to relevant papers, projects and past work experiences. Potential employers can easily access student-workers' resumes and review examples of their work by visiting the personal portfolio.

# 3.3.7 Showcase pages

A multimedia format showcase page is possible for students to create. They could use this page for a more comprehensive content of most significant accomplishments in dynamic information. This might include streaming videos demonstrating class projects or PowerPoint presentations with short descriptions and personal reflections.

# **3.4 Faculty Member Scenarios**

Professors provide students with learning environments based on not only well structured lecturing, but also correct and timely feedback.

# 3.4.1 Professors investigate the effectiveness of pedagogy

At the end of the semester, professors may want to examine the effectiveness of teaching as well as students' learning processes. They had various kinds of materials and artifacts on course web-sites: syllabus, course materials, student work, online group discussions, etc. By using a electronic portfolio tool, professors could select some of the key materials and artifacts that helped them illustrate the key issues concerning teaching and learning in their courses. The mobile electronic portfolio enabled professors to annotate and index these materials and artifacts for later use.

# **3.4.2** Professors create teaching portfolios for peer review

In order to share findings and self-reflections with their faculty colleagues, professors could create an electronic portfolio. By selecting materials and artifacts onto the template, professors could post their teaching portfolios on their course web-site. The system automatically sent e-mail notification to some of their peers in a selected mailing list to solicit their comments on the portfolio.

# **4** System Infrastructure

From users' view, accumulating, revealing, proposing, and publishing are four major processes to form the mobile learning portfolio system infrastructure[4, 5]. Mobile access makes the whole system become effective because of full scope of using time and locality.

# 4.1 Accumulate

Each learner should be provided with a personal filing system of folders and sub-folders which could be used to accumulate and organize any digital items they choose no matter whether the information is static or dynamic. These items maybe files such as audios, videos, documents, and links to dynamic information acquisition devices, or they may be information web-based forms which they have completed within the portfolio system. Once items are stored in the system, the portfolio owner may access them from any place at any time within the system and refer to them in any number of activities.

# 4.2 Reveal

Often learners will reveal and reflect on various aspects of their raw information, thinking carefully about relationships between learning experiences. The system should support philosophically revealing activities throughout a learner's experience by providing tailored revealing forms and guided thinking activities that encourage and guide the learner through revealing activities. The system could virtually provide information for revealing activities even in a mobile communication status.

# 4.3 Propose

This process is the key activity for learners selecting from a diverse collection of items to propose certain themes. Through selecting and organizing, learners could propose their own thinking in many ways. The system should provide a rich set of tools that give learners creative freedom to propose their own thinking.

# 4.4 Publish

Portfolios may be published and shared with others in the following ways:

- Portfolios may be published and made available to other users of the same system.
- Portfolios may be published and made available to anyone by e-mail address.
- Portfolios may be published and made available to a publicly accessible URL that anyone can review.



Figure 2 Information flow of the mobile e-learning portfolio

# 4.5 Case Study 1. Pilot of "how I spend time on campus"

A prototype system to record student learning activity data, through the use of PDAs was developed using web based forms over 2 years ago for undergraduate at NKNU. This involved developing specific web page for students and staff to 'tick off' learning activities on campus.

PDAs were connected internet via a USB cradle with synchronization to a PC or via wireless wifi access point. The data submitted to the web server was stored to a MySQL database. The information input procedures were listed as follows:

- 1. Login to the web site.
- 2. Click on "What I learn Database"
- 3. Click on "New Entry"
- 4. Tick off events
- 5. Check the date
- 6. Choose ID via pull down menu
- 7. Save
- 8. Search & export

# 4.6 Case Study 2. Pilot of "How I did in my class?"

It was a prototype system to send students with their course notes from teachers. The itemized learning objects of each class were listed as a checklist for learner to evaluate their own learning. System scenarios In this case, there are two major roles in using this system: Teacher and student.

# 4.6.1 Accumulate

The system provided user to establish basic information about learning based upon formal courses schedule. Teaching schedule of each teacher and classes' schedule of each student were considered basic data of this platform. Syllabus of each courses were also included as basic information for the teacher to organize proper information for sending to students on certain time.

Table 1 Accumulating items of teachers and students

Role	Items
Teacher	Classes' objects
	Assignments
	Examinations
	Teaching materials
	Supporting information
	Learning response of students

Student Class schedule Learning objects Homework / Assignment of each class Teacher's advice

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Figure 3 Information input screens of mobile e- learning portfolio of case **"how I spend time on campus"** 

For teachers, they should prepare teaching plan with detail classes' objects, assignments, examinations, teaching materials, supporting information, and advices of learning. Students' responses of each class, teacher should record information of students' responses according to all learning activities.

For the students, they could get basic information according their formal registration-records, such as class schedule, learning objects of each class. They would get further information about their learning activity from their instructors. After each class or learning activity, students may store their own note of learning according to activities. In the table, the possible accumulated items were listed according to roles.

#### 4.6.2 Reveal

After accumulating students' response of learning activities, teachers could to evaluate how well students learned and make a diagnosis about certain learning difficulties. The system provides teachers with the comment check lists for recording their evaluation. The system also could be used to record learning difficulty of each student by their teachers.

Learners' could identify what happened to their learning by recording their reflection of learning. They may point out their learning progress, learning efficiency, and learning difficulties. The tasks of this procedure were to :

- 1. Identify how well learners had done
- 2. Evaluate learner's performance
- 3. Diagnose learner's difficulty
- 4. Identify what already learned.
- 5. Identify what not learned well.
- 6. Identify problems that would be brought into next class.
- 7. Identify what should do to overcome the problem.
- 8. Identify learning progress.

### 4.6.3 Propose and publish

Learners could play positive role to propose their ideas of maintaining progress or improving plan. They might call for more help or devote themselves to study. Several things could be proposed and be conducted as their actions. Whenever they feel confident with their learning outcomes, they could publish their artifacts and find out what others thinks about their learning outcomes. Through continuing communication with instructors and peers, students hold their own will and mind on active learning. Major activities were listed as follows.

- 1. Send instructor your after-class self-learningevaluation report
- 2. Send revised problems to your instructor before class.

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Figure 4 Information input screens of mobile e- learning portfolio of case "**How I did in my class**"

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Figure 5 four screens of mobile e- learning portfolio of case "How I did in my class"

# 5. Discussion & Conclusion

# 5.1 Discussion

A mobile electronic learning portfolio system was laid out and presented. On the other hand, reviewing and evaluating portfolios had become an extended problem. As a learner, there would be needs of calling for guidance.

To fully understand the potential impact of the mobile electronic learning portfolio system on education, institutions need to take into account the current environment within higher education. Evaluating student performances always has been an important issue for academia. Institutions have traditionally tried to address it through assessments and transcripts, but these methods are shallow and one-dimensional.

There is a wireless network in place that allows mobile portfolio creators to distribute their portfolios at no cost to other users for assessment and review. Portfolio creators can invite anyone to view and comment on their portfolios. The portfolio user simply needs to have access to the Internet, a URL and a password. That is the power of database-driven course management systems. These systems capture significant amounts of intra-course data and artifacts that can more easily be assembled and re-purposed for evaluation by instructors or potential employers.

# 5.2 Conclusion

Whenever students and faculty have become more comfortable with the mediated mobile learning environment, exciting pedagogical innovations have been introduced into course management systems such as mobile threaded discussions, mobile shared white boards, mobile collaborative workspaces and other educational strategies and tools. Thus, materials collected during a course usually contain not only a student's test scores and papers, but also a sense of the interactions that occurred between students and faculty. Integrating appropriate parts of this information into a mobile electronic portfolio should then be a simple matter of a few clicks.

The theory and value of portfolios has been more fully developed. Unlike paper-based portfolios or e-portfolios, mobile electronic portfolios can more effectively provide both an authentic assessment of learning as well as significantly more mobile information about the learning experience. The aim of the mobile electronic portfolio is to dynamically present and document the work and the process that the student and faculty member have used to get to a certain point. There is an ease of annotation that encourages dialogues. This evidence can then be captured, stored, and organized and reorganized to meet specific needs, such as relating the advising process to the student's strengths and weaknesses, in order to make future learning experiences more relevant. Significantly, this is of great benefit to the academic dialogue that goes on throughout the student's participation in academia. Mobile electronic portfolios also can make it possible to include information, artifacts and reflection on more than just the courses that a student takes. They can be used to capture learning experiences that usually fall between the cracks - that do not result from a specific class, but are gained from social interactions, extra-curricular activities, internships, things happened during traveling, thinking, and other less formal learning opportunities. The desired outcome is that when a student finally uses the portfolio as a tool to seek employment or advanced study opportunities, the whole will be superior to the sum of the parts.

Based upon reviewing cases of implementing e-learning portfolio, four-step-model was concluded. It is suggested that further study could be conducted to establish web-based server dedicated for mobile e-learning portfolio according to this four-step-model to explore learning contributions of each step..

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