The ePortfolio Process: Implementation and Practice

Marco Antonio Mendoza Calderón
Consultoría en métodos de aprendizaje corporativo
Draco Wiki Estudio
México
marco@blogfolios.com

FACILITATING REFLECTION THROUGH EPORTFOLIO AT TECNOLÓGICO DE MONTERREY.

ABSTRACT

The chapter describes the Tecnológico de Monterrey implementation of an original ePortfolio model in the Mexico City Campus. This model is grounded on student's reflections in three broad areas of student's lives designed by Jesus Meza, Ph.D. The implementation was launched in August 2002, with 60 students studying two different majors. By January 2005, the number of student portfolios had grown to 5000, covering 18 different majors. According to the mission of the Tecnológico de Monterrey for the year 2015, the authors consider that the ePortfolio model will evolve into a comprehensive communication tool reflecting the personal, academic and professional achievements of the community at the Tecnológico de Monterrey.

INTRODUCTION

According to the report to UNESCO of the International Commission on Education for the Twenty-first Century (1998), the main objective of **academic education** is to develop the potential of each student in order that they can be mentally independent and socially compromised, and that they are equipped with the knowledge, capabilities, values and attitudes that will help them to have a full life and perform a positive role in their communities.

In order to achieve this, our educative institutions face a challenge in the form of changes in our educative models, and also the integration of **holistic concept of education** with its benefits, comprehending the development of the person and the integration of basic elements in the social culture, inside the frame of institutional culture. Other authors, such as Mónica Porres, Ph.D., in

her chapter La Construcción de un Modelo Educativo at the book Aprendizaje Basado en Problemas, mentions the unquestionable use of new educative models which attend the conformation of new social models that help to answer the 21st century problems

According to this, in 1997 the Tecnológico de Monterrey undertook an important change in its educative model (MET) that gave insight to the Proyecto Portafolio Electrónico (**Electronic Portfolio** Project) released in 2002. This project arises as an initiative of Jesus Meza, Ph.D., academic member of the Research and Innovation in Education Center (CIIE), who was in charge of the project until the midterm of second stage (January 2004). Meza received others assignments so the Office for Academic Development (DDA) decided to expand the project and bring together the authors of this chapter. The first assignment was constructing a conceptual frame and assures the continuity of ePortfolio at the Tecnológico de Monterrey.

CONCEPTUAL FRAME OF THE EPORTFOLIO PROJECT AT THE TECNOLOGICO DE MONTERREY

To establish the purpose for the ePortfolio, we adopted the constructivist approach to teaching-learning processes, the postulates of significant learning and those of knowledge management. This postulates as we understand them are the following:

The Constructivist Frame

There is certain consensus about the role of education to promote the **integral development** of people and the learning of some cultural contents so that they may become members of the sociocultural reference frame. Yet, some discrepancies occur when one tries to explain what is understood as development and learning, and what the relationships are between those processes

are. The development can be understood as a process whereby people acquire the social group culture in which they are submerged, through the structures available at each moment. Even though people development has internal dynamics, according to Piaget, this is possible due to the social interactions between the individual and the many agents acting as mediators of culture, parents and teachers, according to Vigotsky's postulates.

In this development conception, learning is understood as an individual building process to make a personal and unique interpretation of such culture. From this perspective the learning processes are not a mere association between stimuli and responses, or a knowledge accumulation, but qualitative changes in the existent structures and schemas of increasing complexity. Learning is not just a copy or internal reproduction of reality or external information. This makes the learning process unique and unrepeatable each time. Individual construction is not opposed to social interaction; on the contrary, they complement each other. The same as development, learning is an internal process: nobody can learn for us, but we learn due to the social interaction process with other people acting as mediators of culture's contents. In the educative environment students learn culture's contents established in the **real curriculum**, thanks to the processes of interaction and communication with their professors and classmates.

The Postulates of Significant Learning

The constructivist conception, having as an explicative frame the teaching and learning process, is nurtured by many theories, Ausubel's "Significant Learning" being the most useful, since it was formulated inside the classroom and for the classroom. Ausubel (1990) thinks there are many kinds of learning, but it must tend to promote significant learning, comprehensive and related by definition. From this point of view, the act of learning entails a change in previous conceptions

and the understanding that such learning is useful to keep on learning. Conditions that make it possible are related to the person and the material. In this case the student assumes an active role in knowledge building and rebuilding.

The integral development of the student must take into account the four learning pillars proposed in the report to UNESCO of the International Commission on Education for the XXI Century (1998), presided by Jacques Delors. These pillars are the following:

- "learn to know"
- "learn to do"
- "learn to be"
- "learn to live together"

Knowledge processes are inseparable from teaching processes; moreover, they are interdependent. Our teaching plan approach is decisive, because it can help us (or not) to accomplish that the students build significant learning. From the constructivist conception, teaching does not mean to transmit finished knowledge to the students; it must also provide the required aid to the students so that they can build the basic knowledge mandated by the formal curriculum.

Knowledge Management

The knowledge management movement was born in the mid 90s. Its main mission is to create an environment in which knowledge and information available in an enterprise are easily accessible to stimulate innovation and improve decision-making. In a more personal aspect, a new concept

named Personal Knowledge Management (PKM) was formed, combining Knowledge Management and Personal Information Management.

Davenport and Prusak (1998) conceive Personal Knowledge Management as a set of processes to organize and integrate the information that individuals consider important, and then one can make it part of one's personal knowledge database. They also mention that it is mandatory that workers in the **Age of Knowledge** have tools to transform random pieces information into something systematically applicable and capable to increase their personal knowledge.

The **new knowledge-based economy** and the changes emanating therefrom, have demonstrated to us the fact that, to be a competitive individual or community, one cannot apply a set of identical recipes to every situation; on the contrary, we need activities and dynamic solutions with many factors included, and that prevents us from forecasting what will happen in the future. This situation compels professionals and their communities to review and constantly reflect upon their practices to identify the factors and strategies they will use to promote competitiveness in their regions. In other words, they will build knowledge through the significance of their professional acts.

The understanding of global processes by the students and future graduates requires a deep knowledge about thought, language, intelligence and the activities and mental processes of attention, perception, memory, representation, reasoning, decision-making, problem-solving, and so on. Besides these aspects, it is very relevant to know the affective and emotional aspects, given their great influence in the processes of student learning and people well-being. These skills are essential in a world gradually more changing and uncertain, where the individual uses some

information-demanding capabilities, related to the improving of their processing capabilities and the use of thinking strategies that maximize the learning ability to build knowledge.

THE EPORTFOLIO PROJECT

The portfolio model in education was born in the beginning of the 90s, as evidenced by the Paulson and Paulson and Meyer publications. These writings emphasized the documental compilation for its later evaluation. The portfolios were defined as a documental compilation made by the student, according to an evaluation purpose which enables the identification of student's learning of concepts, procedures and efforts. These paper or traditional portfolios acquired new validity with the writings of Helen Barrett, Ph.D., a researcher at the University of Anchorage, Alaska. In 2000, Barrett proposed a new portfolio model with an electronic (online) foundation, whose axis is the reflection and not an accumulative work gathering.

Besides Barrett's works, Levin and Camp's writings influenced the creation of a unique electronic portfolio's model for the Tecnológico de Monterrey. Levin and Camp established that professionals who do not reflect upon their work are inefficient to link theory with practice. With this vision in mind, in August 2002, Jesus Meza, Ph.D., presented his preliminary idea for the Tecnológico de Monterrey's electronic portfolios model.

Meza's eportfolio model is grounded on student's reflections in three broad areas of student's lives. The first being personal reflection including student's values, feelings, attitudes. The second is the academic area, where students reflect about their life plan and goals in relationship to their major. The last area deals with reflection about the way students construct their

competencies for their future careers. Taking as a starting point the statement of Tecnológico de Monterrey's Mission toward 2005, the eportfolio project is an endeavor to give the students the ability to be educated while they reflect upon the contents that they regard as significant and important in their professional studies. The main purpose is that the students focus themselves on learning, not on their grades. By these means are conformed student records and profiles about their pass through the university, the academic and extracurricular activities that contribute to the students' personal and professional formation in a holistic manner.

STAGES OF THE PROJECT

First stage (August 2002 - August 2003):

In its beginnings, the project was proposed as a tool to close the deal in a recruitment process, in the same way as some European and US universities did. The portfolios were pages created in a crafty way: the students received a basic HTML programming course, and each page was the result of the skills and knowledge of each student. The result was a great variety in design along with the frustration of people lacking technical skills.

To begin this stage, we performed a test with two groups of 30 people. The students were supposed to integrate all their portfolios, starting with the first semester, paying special attention to the personal part. Nevertheless, experience showed us that in order that the students achieve this objective, the project must be explained in different subjects to develop simultaneously the academic growth of the student, and also to seek for subjects adequate to the contents they were asked to create. Sixty portfolios were made in this stage with only two assigned professors in two majors.

Second stage (August 2003 - November 2004):

To help students with technical difficulties, we designed HTML templates with the main sections and links. This reduced the design difficulties, but there were still some problems to upload the Web page to the server and then publish it. Some sort of standard was achieved, but some students still had problems. The sites were stalled and there was no information backup. Each student was responsible for his/her site, and that caused information lost and the lack of updates for future semesters. 2500 portfolios were made in this stage with the incorporations of 8 professors in 8 majors.

Third stage (December 2004 - November 2005):

In this stage the system was developed to create and manage eportfolios, which generates the portfolio with PHP programming and the information was saved in a database. The procedure to generate an eportfolio is similar to the process to obtain a **Blog**.

These circumstances allowed tracing the Web pages, saving them in a database and offering personal services to the students through their eportfolios, as direct communication, diagnostic applications, among others.

The necessity to have teachers giving the class is reduced, since this system gives to students the necessary options to solve the process by just having a basic knowledge of the Internet. As a result there are just two teachers attending all the groups.

There is no individualization in the pages design, as they use the same standard design. There are about 1500 students and therefore the same number of portfolios each semester. In this stage 5.000 portfolios were made in 18 majors with only 2 professors.

Fourth stage (August 2005 -)

Now, in 2005, we can observe a revamping of the MET (Tecnológico de Monterrey's Educative Model) as one of the strategies to comply with the new mission of Tecnologico de Monterrey towards year 2015. In this new mission one can identify a deeper attention to the formation of the student within a humanistic and integral educative model.

"Tecnologico de Monterrey's mission is to educate upright and ethical persons with a humanistic vision, competitive in the international environment of their professional field, and also citizens committed with the economical, political, social and cultural development of their community, in addition to the sustained use of natural resources."

Because of this change at the MET, the future we foresee for the electronic portfolio system includes the convergence in a system provider of different communication services between students and the academic and extracurricular areas of the Institute. In this way we will achieve an integration of student information in different areas; also this will expedite the students' management and development by their **Career Director** and other areas related with the student development. That enables the creation of a Virtual Community, a non-academic space that eases the communication among users, students and professors outside the strictly academic environment. The community allows keeping their members informed about recent studies, job offers, articles, interesting pages, resources and/or services on the Web, in a prompt and

convenient way. The system's name is Sistema Electrónico de Apoyo al Desarrollo Integral (SEADI).

FUTURE TRENDS

Sistema Electrónico de Apoyo al Desarrollo Integral: SEADI (Electronic System to Support Integral Development)

Nevertheless, how can we use information technologies for the benefit of educative managers? How do we trace our students' development through an electronic solution? Until now the Learning Management System (LMS) solutions have brought educative managers closer to the classes, with the purpose to trace students. However, these tools do not bestow the option to trace what students learn or their integral education (that is to say, their academic and extracurricular education). Not only records are important, but also students' learning and development as integral persons.

In the light of these new proposals and the emphasis posed on integral education, the Electronic Portfolio project is now repurposed as a Content Management System (CMS), named SEADI. In this new proposal, SEADI will be more than a proof of the students' efforts in an institution: now it will be an authentic space for the individual virtual reflection and for collaborative tracing, and will serve as a tool to create a virtual learning community with inherent benefits supporting the Tecnológico de Monterrey's new mission.

Emergent technologies opened the possibilities for the learning of communities increasingly diverse and not necessarily concurrent in time and space, what is experimented in the Tecnologico de Monterrey's Educative Model (2002). These technologies are support tools for

new methods in teaching, learning, research, creation and assessment. Its integration makes necessary to conceive the design of learning environments including various activities, in addition to virtual education experiences linked to the rest of the world.

According to Levin and Camp (2002), this linkage will be achieved through the reflective and critical awareness that allows understanding and transforming the educative experience into responsible actions of personal, professional and social nature.

The ePortfolio (now SEADI) proved to be an effective tool to promote a systematic reflection of the significant learning and the transforming action in the students, but also to record these reflections in a virtual public space able to develop the students' responsibility and awareness.

In the SEADI our students will have a tool to reflect upon their learning and self assessment, and they will have also virtual spaces of expression and non-academic linkage with the Tecnológico de Monterrey's community. These reflection spaces will let the students to recognize their significant learning, go deeper into their beliefs and practices and value them, with the intention to validate them and confirm them, or to repurpose, enrich and transform them. To achieve these goals, the SEADI works as a tool that eases the reflection in action and the transformation of our students. Also, the SEADI allows us to identify and relate the student in a space outside the formal curriculum, with the different academic and non-academic areas congruently with the Tecnológico de Monterrey's educative model.

Each student in these reflection spaces builds new knowledge and is receptive to the transcendence of this way of thinking, creating a linkage between technology and practice in their

formation. The SEADI gives our students the opportunity to interpret their formative experiences, be they personal, academic or professional. By these means the students are trained to get involved in the **Knowledge Society**, since they assess their own knowledge building.

The SEADI is part of an intensive effort to innovate and change our Institution. Hence, it has the potential to transcend the curriculum, the technological integration level and the learning process through reflection, as well as the administrative decision-making related with the program assessment.

Purposes and Reach

An electronic portfolio shows a thorough compilation of exemplar evidence that lets the student to demonstrate his/her knowledge, capabilities and dispositions through his/her work and the evolution of the latter. Use of technology makes this process easier to be systematic, perdurable and practical. Some benefits obtained by using SEADI are:

•   Stimulates expression. It allows the students to explore multiple individual forms of their expressive ability.

•   Promotes technological competence. It offers the students opportunities to develop technological competencies in the use of information and new technologies.

•   Motivates cooperation. Students shall invite professors and their mates to appraise their portfolios in the SEADI and ask them for opinion. This action encourages collaboration in the virtual learning community.

•   Eases communication. It provides a space for collaboration and electronic feedback hardly ever achieved by paper portfolios, due to the promptness in communication. As a consequence,

the communication is faster between professor-student, student-student and student-academic administrator.

How SEADI works

SEADI is based on the system designed to create and manage ePortfolios implemented in stage three. This system generates the portfolio as a dynamic Web page with PHP programming (a free and open source technology), using and storing the information in a MySQL database (free and open source technology).

The procedure to generate an eportfolio is similar to the process to acquire a Web-based e-mail address or **Web log**, and therefore the students do not need to have advanced skills in computing, HTML programming or Web page edition. This ease of use has increased the acceptance by students, especially in careers traditionally resistant to technology, such as Law or Psychology students. SEADI works in modules and nowadays it has an information edition area named work portfolio, which serves as an interface for students, and an open area named public portfolio.

See Figures 1 and 2

The Work Portfolio

The work portfolio is the place where students find access to electronic resources offered by the Tecnológico de Monterrey, Mexico City Campus. This is the case of courses in the Blackboard platform, the Campus' Digital Library, the Virtual Center of Attention and Service to Students, and the Student Portal.

See Figure 3

In the left navigation bar are the sections to edit their public portfolio or to modify their account data.

The most important information in the portfolios are the compilation of evidence from the most transcendental and representative knowledge of their careers. They demonstrate the efforts, progress and achievements of our future graduates, what is useful in the moment and retrospectively because they turn into a reminder of the goals previously set up; that allows repurposing the personal and professional course of the student and the professional guiding them. **See Figure 4**

CONCLUSIONS

Our experience with the students let us observe that the process to develop an ePortfolio helps the students to set themselves challenging but realistic goals, and to achieve them gradually and in an organized way. The students get accustomed to having a register of their advancements and have the ability to recognize their deficiencies in the future. In this way the project has contributed to the registration of the professional profile of the student given the expertise and the results of the former students in job interviews.

The use of technology of dynamic pages with databases lets us have a better management of human resources for training, and also saves time devoted to update the students' profiles. As a result, the students accept better the instrumentation of the electronic portfolio.

We are convinced that the electronic portfolio is more effective when it is supported and integrated in a system of electronic communication and registration, one that facilitates the

tracing of the academic performance. This system will ease the tracing of portfolios and go further, for it uses databases to create dynamic Web pages, which creates an opportunity to add interaction and offer personal services as direct communication, diagnostic applications, or group management. That generates something bigger than a space for virtual reflection and gives birth to a virtual and non-academic community.

This virtual community is a non-academic space that enables easy the communication among users, students, and teachers outside the strictly academic environment. This will keep informed the members of the university community about recent studies, job offers, articles, interesting pages, resources and/or services in the net, in a prompt and convenient way.

References

Barrett, Helen C. (2000). Create Your Own Electronic Portfolio (using off-the-shelf software). April issue of Learning and Leading with Technology.

Meza Lueza, Jesús (2001). Global public relations on the Web: an exploration of projection of corporate identity online, its effects on public perceptions, and its potential for two-way communication.

Levin, B., & Camp, J. (2002). Reflection as the Foundation for E-Portfolios. Society for Information Technology and Teacher Education International Conference, Volume 2002, Issue 1, march 2002

Meza Lueza, Jesús (2002). Marco Conceptual del proyecto portafolio electrónico en el Tecnológico de Monterrey. (e-Portafolio)

Ramírez Buentello, Joaquín, & Mendoza Calderón, Marco Antonio (2005). e-Portafolio un espacio de desarrollo en la Web. Virtual Educa 2005 - Encuentro Internacional de Educación Superior UNAM (Cd. de México - México).

Ramírez Buentello, Joaquín, & Mendoza Calderón, Marco Antonio (2004). Nuevo marco conceptual del proyecto portafolio electrónico con enfoque en la misión al 2015 del Tecnológico de Monterrey (SEADI). Retrieved September 22, 2004, from http://www.ccm.itesm.mx/dda/eportafolio

Mendoza Calderón, Marco Antonio, & Ramírez Buentello, Joaquín (2006). Facilitating Reflection Through ePortfolio at Tecnológico de Monterrey. Book chapter in Handbook of Reasearch on ePortfolios, Ali Jafari (Ed.) (pp. 484-493). Idea Group Publishing, Hershey, PA.