AN APPLICATION OF ENVIRONMENTAL EDUCATION IN NATIONAL TAIWAN UNIVERSITY OF ARTS E-LEARNING PLATFORM

Sheng-Feng Lin
National University of Arts
E-Mail: linsf@mail.taivs.tp.edu.tw

Huey-Shyh Tan
National University of Arts
E-Mail: hueyshyh@hotmail.com

ABSTRACT

This article analyses the development of the course “Education for Environmental Sustainability” by using the Learning Content Management System (LCMS) in National Taiwan University of Arts (NTUA) E-learning platform. There are three segments for this article. First, it discusses the characteristics of the NTUA E-learning platform, which is based on the theory of E-learning, and to discern the differential function of authorization between teachers and students. Second, it analyzes how the E-learning version of “Education for Environmental Sustainability” course is planned and developed. This course is an outgrowth of Blending Learning, which is the integration of Classroom Learning and Electronic Learning. The course development theory is based on the process of five stages: A (Analysis), D (Design), D (Development), I (Implement) and E (Evaluation). Third, it concerns the usage of, and the suggestion for, the platform. With students as the end users, it should be designed in a student-oriented way, especially when the learning achievement of NTUA students originated mainly from presenting their individual talent (i.e., their artwork pictures or performance videos). Hence, the students’ performance talent and comments will be significant references for future development of e-contents, e-services, and e-technical in art universities.
Keywords: E-learning, Blending Learning, LCMS, Environmental Education, Development Sustainability

INTRODUCTION

Background

The National Taiwan University of Arts (NTUA) developed the NTUA E-learning platform system in 2008 and application of the platform gave many benefits for both teachers and students. For example: (1) increased teachers’ efficiency of teaching and analyzing data, and (2) increased students’ interest and efficiency of learning. Therefore, instructors practiced and applied the NTUA E-learning platform in the “Education for Environmental Sustainability” course. The NTUA E-learning platform is a Learning Content Management System (LCMS). The display on the front page showed that the system is a student-oriented platform. Analyzing the functional aspect of LCMS, it consists of six sections: platform entrance service, student data management, e-content management, course management, academic achievement management and assignment management.

Purpose

According to the background, the purposes of this research are as follow:
1. Teaching requirement: to find out whether the NTUA E-learning platform is in accordance with the instructor’s teaching requirement.
2. Learning requirement: to find out whether the NTUA E-learning platform is in accordance with the student’s learning requirement.
3. Interaction requirement: to find out whether the NTUA E-learning platform is in accordance with the interaction requirement of the instructor and the students.
4. Learning Achievement requirement: to find out whether the NTUA E-learning platform is in accordance with the students required learning achievement.

Design

The course development theory was based on The Systematic Design of Instruction, the five-stage procedure of this theory as the following: A (Analysis), D (Design), D (Development), I (Implement) and E (Evaluation) (Dick & Carey, 1996). We also applied the “Blending Learning”, which was the integration of the Classroom Learning and the
Electronic Learning.

**Method**

Qualitative research was applied in this article. According to the Document Analysis method, we designed the learning feedback sheet for each topic and completed by students in 19 weeks. After that, the learning feedback sheets would be scanned and uploaded to the Teaching Blog. The data then were been interpreted and analyzed. Reasonable conclusions and suggestions were proposed based on the research results.

**RESEARCH PROCEDURE OF COURSE DEVELOPMENT**

**Procedure of Course Development**

Alajmi (2009) indicated the significance of E-learning and came up with a method to raise the standard of E-learning. First is to design a content which meet the needs and expectations of students. It is also important to inspire students with the “constructivism” of E-learning mode which leads them to recognize acknowledge of the construction through the E-learning course program. Secondly, it applies an appropriate design principle so that to avoid duplicating the conventional electronic educating format. Finally, it is about searching for a compatible instructional design to ensure that the E-learning works effectively.

Procedures of course development are as follows:

1. **Analysis stage**

   During the analysis stage, we identify the students’ existing knowledge and abilities.

   a. Identifying the teaching objective: The EE course provides students with basis knowledge of Environmental Education (EE) in order to offer them applicable knowledge in the specialized field. For example, the Fine Art students are able to create the logo related to EE, i.e. the Performing Art students are able to perform with the elements of EE. Moreover, students enable to use the concept of EE in daily life.

   b. Analysis of the students’ background: NTUA’s students have various kind of specialties, such as music, fine art, dancing, drawing, graphic communication, visual communication, drama, and others humanities and social related courses. Thus, the EE course should be directed towards the nature conservation and
humanistic concern to fulfill the requirement of all the students.

c. Analysis of the course requirement: Due to the drastic change in the environment, the course promotes the importance of sustainability development leading students to become the best endorsers of the environment protection and energy saving for the future.

d. Analysis of the lecture materials: There are many textbooks of “Education for Environmental Sustainability”, but none of these is specific for Arts School students. Therefore, these materials used in this course require the instructors’ reorganization and integration, then revise the relevant materials thematically, enable to suits for Arts students.

2. Design stage

In the design stage, we obtain the analysis stage’s information to set the specific teaching goal with consideration of environment and others restrictions. This makes the teaching goal to be practicable and feasible.

Most of the students in the course has artistic appreciation characteristic, instructors develop a set of related topics and explains the concept in a simply way to inspire these students.

Instructor also uses the multimedia teaching and the “Learning Feedback Sheet” to comprehend students’ studying achievement. In addition, the NTUA E-learning platform provides the supplementary information for students to performance. By viewing their peers’ works, students are able to develop their critical analysis capability from peer assessment. The “Blending teaching” then had achieved its goal.

3. Development stage

Based on the Design stage, instructor has developing the instructional strategies, manufacturing the actual lecture materials and establishing the learning evaluation implement. The development of this E-learning course material mainly divided into three parts. First is the application of multimedia teaching materials in classroom-learning. This provides the revision to students who are not fully understands their lesson in classroom. Second, supplement of relevant teaching materials. Third, the show case of the students’ works enable students to learn from other’s work.
4. Implementation stage

In this stage, the teaching programs that had planned in the previous stage are established and put into practice. For establishment, it is meant to build up the multimedia teaching materials of EE, the NTUA E-learning platform courses, students’ submission platform, and to set up the relevant topics of discussion. The multimedia teaching contents will be the topic of discussion in the lesson. After the lesson, students are required to complete the “Learning Feedback Sheet”. Then, it is uploads to the NTUA E-learning platform. Students are able to share their thoughts by having discussion at the platform in order to enhance and to reinforce their learning.

5. Evaluation stage

This stage operates the evaluation of overall teaching design system. This evaluation is evaluates the efficiency of the entire teaching program. The evaluation is based on mid-term and final examination score.

**THE DEVELOPMENT OF ENVIRONMENTAL EDUCATION**

According to the procedure of course development, table 1 has been scheduled.

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
<th>Discussion Area</th>
</tr>
</thead>
</table>
| 1     | Environmental Sustainability (A) | 1. Atmosphere  
2. Water Resources  
3. Land Resources |
| 2     | Environmental Sustainability (B) | 1. Protect the Oceans  
2. Protect Biodiversity  
3. Environmental Management |
| 3     | Society Sustainability (A) | 1. Population and health  
2. Living environment  
3. Social Welfare |
| 4     | Society Sustainability (B) | 1. Cultural assets  
2. Cultural and Creative Industries |
| 5     | Economic Sustainability (A) | 1. Economic Development  
2. Industries Development  
3. Public Transport Development |
| 6     | Economic Sustainability (B) | 1. Energy Strategies  
2. Resources Reuse |
| 7     | Sustainability Development Motivation | 1. Educational Development  
2. Science Research and Development  
3. Informational Society |
Table 1 Topic for 19 weeks (a semester) of EE course (Cont.)

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Topic</th>
<th>Discussion Area</th>
</tr>
</thead>
</table>
| 8     | Mechanism for Sustainability Promote | 1. Public Participation  
                                  | 2. Reinventing by Government  
                                  | 3. International Cooperation |
| 9     | Green Building                     | 1. Setting and Structure Design Efficiency  
                                  | 2. Energy Efficiency  
                                  | 3. Water Efficiency  
                                  | 4. Materials Efficiency |
| 10    | Sustainability Campus              | 1. Sustainability Campus Plan  
                                  | 2. Campus Landscaping of building and facilities  
                                  | 3. Green Mark Certification |
| 11    | Eco-Community                      | 1. Build a safe, healthy and local characteristics of the community  
                                  | 2. Implementation of 3R Policies: Repress, Reuse, Recycle |
| 12    | Sustainability Campus              | 1. Sustainability Campus Plan  
                                  | 2. Green Mark Certification Plan  
                                  | 3. Application of recyclable building material |
| 13    | Energy Saving & Carbon Reducing    | 1. Energy Saving  
                                  | 2. Greenhouse Effect  
                                  | 3. Energy Reuse Technology |
| 14    | Green Map Design                   | 1. Green Map Concept  
                                  | 2. Green Map Making  
                                  | 3. Presentation of Green Map |
| 15    | Cultural & Creative Industries     | 1. Cultural & Creative Industries and Sustainability Development  
                                  | 2. Creative Life and Sustainability Development |
| 16    | Green Campus                       | 1. The Quality of Campus Environment  
                                  | 2. The Management of Campus  
                                  | 3. EE of the Campus |
| 17    | Green Industries                   | 1. Green OA Office Products  
                                  | 2. Green Cleaning Products  
                                  | 3. Green Information Appliance Products |
| 18    | Eco-Leisure Industries             | 1. Eco-Leisure Concept  
                                  | 2. Eco-Leisure Industries Market  
                                  | 3. Eco-Leisure Industries Categories |
| 19    | LOHAS lifestyle                    | 1. LOHAS  
                                  | 2. LOHAS value  
                                  | 3. LOHAS Consuming Model  
                                  | 4. LOHAS cultural |

THE RESULT OF LEARNING ACHIEVEMENT

The Academic Records

Instructor is notified by the students’ learning time and the times of their participation in discussions after they signed in the webpage of the NTUA E-learning platform. There were 70% of students using this platform; the average time is 4 hours per student per week. 【Website: http://elearning.ntua.edu.tw/teach/index.php】
The Learning Feedback Sheet

In the “Education for Environmental Sustainability” course, the “Learning Feedback Sheet” was designed with reference to the discuss topic weekly. Students integrate the teaching content with the creative thinking by complete the Learning Feedback Sheet in class. Hence, this Sheet is a record of the students’ learning achievement in qualitative analysis. Moreover, the masterpiece (the Learning Feedback Sheet) would be digitalizing by scanning and uploading to the NTUA E-learning platform to serve the purpose of sharing among the community.

Table 2 shows the amount of student attend EE course and their satisfaction, the data showed in E-portfolio [http://elearning.ntua.edu.tw/~003321/eportfolio] for each year form 2006-2010. There are 14,973 browsers visit the e-portfolio blog until now.

<table>
<thead>
<tr>
<th>Students/ (Satisfy)</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>36 (86.61%)</td>
<td>14 (78.79%)</td>
<td>33 (88.12%)</td>
<td>35 (87.35%)</td>
<td>37 (86.25%)</td>
</tr>
<tr>
<td>Class 2</td>
<td>24 (84.08%)</td>
<td>15 (92.08%)</td>
<td>30 (84.43%)</td>
<td>20 (89.20%)</td>
<td>14 (92.98%)</td>
</tr>
<tr>
<td>Class 3</td>
<td>35 (89.63%)</td>
<td>14 (78.79%)</td>
<td>39 (88.75%)</td>
<td>41 (90.91%)</td>
<td>N/A</td>
</tr>
<tr>
<td>Total (Ave sat)</td>
<td>95 (86.11%)</td>
<td>43 (83.22%)</td>
<td>102 (87.10%)</td>
<td>96 (89.15%)</td>
<td>51 (89.62%)</td>
</tr>
<tr>
<td>Web browsers</td>
<td>N/A</td>
<td>N/A</td>
<td>13,260</td>
<td>37,259</td>
<td>78,564</td>
</tr>
</tbody>
</table>

Source: http://uaap1.ntua.edu.tw/ntua/f_index.html

CONCLUSION AND RECOMENDATIONS

After the integration of the “Education for Environmental Sustainability” course with NTUA E-learning platform for teaching, students experienced the Blending Learning way (i.e. Classroom learning and E-learning). There were many advantages for the students and instructor in teaching. The followings benefits conclude this research:

1. E-learning was the solution for searching information.
   a. Since there are lots of Environmental topics and information of this course, the use of E-learning platform will help to update anytime.
   b. There were only 36 hours of class time for a semester. Therefore, using the E-learning platform will makeup whenever students out of school for show case.
2. E-learning provided the records of e-study.
   a. We have 955 of learning feedback sheets and 14,973 browsers until now. The total amount has proved that the students interested in browsing image from internet.
   b. E-learning platform could be divided into two smaller platforms, which are internal platform and external platform. Internal platform is used for saving and protecting teachers’ intellectual property. External platform is used for sharing the students’ learning feedback sheet, which could promote the students’ talents. Teachers need to announce students that it is free to upload his/her project.

3. E-learning provided the opportunities of peer-assessment.
   a. The learning achievement of the students was uploaded on the “image part” of the webpage to perform. Students would be curious about the comments of the masterpiece’s owner as well as their peers’ works.
   b. Teachers could motivate students by using the learning feedback sheet instead of paper work. This is because the students prefer presenting their work by images and it also interest browsers to read.

REFERENCES
