IMPROVING THE ATTITUDES AND THE SKILLS OF THE EDUCATIONAL TECHNOLOGY STUDENTS/TEACHERS THROUGH CHANGING THE METHODOLOGY OF THREE SUSTAINABILITY-BASED COURSES

Hussein Abdelfatah*

* Faculty of Education, Suez Canal University, Egypt.

Abstract

The present study describes a suggested learning context of three courses for educational technology students/teachers at the Faculty of Education, Suez Canal University, Ismailia, Egypt. Traditionally, courses of educational technology, in the Faculty of Education, were developed in a pure abstracted method despite of its practical nature. Consequently, the present study aims to encouraging the concepts and values of sustainable development in three courses, which are: Photographing; Multimedia Authoring; and Projection Devices. The researcher used the project-based methodology instead of the traditional way of teaching. In the Photographing course, in addition to mastering photographing skills, students were asked to design a booklet based on photos that represent relevant phenomena to agricultural and environmental issues. Similarly, in the Multimedia Authoring course, they produced multimedia presentations of sustainable development values. Furthermore, in the Projection Devices course, students designed economical alternatives for educational technologies in the light of recycling concept. Some indications showed significant changes in the students’ attitudes towards the three courses. However, there is a need for more implementation to achieve further improvement of students/teachers’ skills in multimedia authoring and their knowledge about sustainable development aspects.

Introduction

Education Technology curricula are usually presented in faculties of education in isolation from students’ daily life, needs, and surrounding environment. It also lacks sometimes the practical applications that serve them in university and the broader context outside the university, despite the fact that many curricula have special characteristics such as photography and multimedia authoring. Moreover, topics in such subjects are dealing with associated concepts in an abstract manner, which hinders learning retention and continuity as a practical experience in career situations afterwards. Also, there are some curricula that contain obsolete information in a subject such as projection devices of which most educational institutions are trying to get rid by retirement.

In light of the above, this study aims at activating the Education for Sustainable Development...
(ESD) concepts and associated processes. The concept of Sustainable Development (SD) is particularly associated with recycling which is consistent with one of the most important e-Learning and instructional design criteria: Recycling and Reuse. Further, transforming such curricula into method of project-based learning and collaboration in this way make learning outcomes sustainable pedagogically and preserves learner’s understanding and memorization of information for a longer term after taking final exams. This will eventually benefit the learners, their university community and future work places and also in applying this concept in their practical life with their families.

Fischer, G. (2013: p16) showed that the culture of participation and collaboration are overcoming major problems of societies in the twenty-first century and making learning a part of students’ lives including: 1) problems revolving in meaningful activities in which students customize their own learning, choose what they need and what they want to learn; 2) problems of a prominence which is difficult to handle outside large teams to solve; 3) problems of a systemic structure requiring the collaboration of many various disciplines; and 4) problems requiring partnership of stakeholders and their owners, because the lack of understanding and defining.

The use of “sustainable development” was greatly apparent in contemporary development. Sustainability is a development type characterized by rationality and deals with life activities aiming at achieving economical growth on one hand and with environment and natural resources preservation on the other. In the Decade of Education for Sustainable Development (DESD), the world has become aware of the fact that sustainable development is the only way to guarantee the fundamentals of life solutions at present and in the future (Sachs, J. D. 2012) (Pearce, D., et al. 2013) (Karatzoglou, B. 2013).

Makrakis and Kostoulas-Makrakis (2012) stated the major challenges that need to addressed when attempting to integrate instructional technologies and ESD in the following:

Education sectors are lagging behind to capitalise on ICTs potential in promoting ESD.

ICTs can empower and help to facilitate greater access to ESD learning by disadvantaged people, marginalised groups and communities. However, the ‘digital divide’ still remains a major challenge.

ESD planning with new pedagogy is an essential part of building a whole school approach to ICT-enabled ESD.

Dissemination and communication of information on innovative ICT-enabled ESD examples and practices may provide opportunities for embedding ESD in the curriculum supported by ICTs.

A vision that facilitates an education model responsive to the development of ICT-enabled ESD is often missing among education planners and policy makers. (Makrakis, V.; Kostoulas-Makrakis, N. 2012)

According to related literature, the use of ICTs and particularly web applications associated with collaborative learning context, such as wiki-based collaborative learning projects, could activate students’ interaction and skills formation (Prokofieva, M. 2013). Therefore, there are some important factors to consider: 1) prior IT skills and experience which required for students-content interaction and student-student interaction, 2) assignment tasks can affect student collaboration, 3) working on shared wiki pages may encourage student-student interaction, but it requires additional work on organising collaboration in groups, and 4) the teacher’s attitudes are important for encouraging student-student interaction and consequential their attitudes toward content and the learning environment.

Pickens (2005) went beyond the simple view of attitudes and clarified that attitudes might help us to define how students can see the different situations, and how they behave in these situations and reflect their feelings, thoughts and actions. So, attitudes provide a view about the structure of the internal beliefs, thoughts and how these two components affect students’ behavior.
in the different situations. Di Martino and Zan (2003) agree with this “multicomponent” definition, which included both the affective and the cognitive components and the behavioral tendency.

Zan and Di Martino (2008) came up with further explanations and stated that in most questionnaires of attitudes, an answer can be characterized as a positive answer and that might refer to different meanings. These meanings varied depending on what the word positive referred to: emotions, beliefs or behaviors. So, when the word positive refers to emotions such as feeling anxious in learning situations, it is seen as negative. In contrast to that, pleasure will be seen as positive. When the word positive refers to beliefs, it generally deals with shared meanings and ideas. The successes in learning contexts that are usually identified with high achievement reflect the meaning of the word positive when these refer to positive behavior.

Gómez-Chacón and Haines (2008) have clarified the meaning of positive or negative attitude according to the relationship between the previous components, so the attitude of one student who likes learning topics is defined as “negative”, if the positive “emotions” are associated with false beliefs about such topics, for example as a set of procedures to be memorized.

The present study highlights some of the possible benefits of integrating ESD in our curricula concluded from reviewing related literature which could evolve students’ skills and improve their attitudes in the following:

A. Enhancing student’s awareness of existing environment problems: The aim is to enhance their responsibility of such problems and to urge them to actively participate to find the suitable solutions for such problems through participating in preparing, implementing, following up, and presenting sustainable development programs and projects (Ramadoss, A.; Poyyamoli, G. 2011).

B. Respect natural environment: This will be achieved through underscoring the importance of relations between students and environment and dealing with human-based natural resources and their content (Lowe, S. E. 2012).

C. Rational manipulation of resources: Development deals with resources as being limited resources to avoid depleting them and to use such resources rationally (Gober, P. et al. 2009).

D. Associating modern technology with community objectives: Sustainable development aims at employing modern technology to serve community objectives (Pearce, M.; Mushtaq, U. 2009), by developing student’s awareness of different technologies importance in development field, how to use the available and updated technologies to improve the community quality of life (Maliene, V.; Malys, N. 2009) and achieving its desired objectives without leaving negative side effects, or making such effects permanent i.e., finding suitable solutions for them.

In addition to the previous, associating instructional technology with ESD is greatly apparent in reducing dependence on papers, home assignments and exams in their paper form and transforming to electronic content and its management in teaching, evaluating, and giving assignments; as well as encouraging student to project-based learning in finding untraditional usages to old devices instead of getting rid of them by retirement, which could lead to environment pollution and wasting its natural and economic resources. This activate the principles of Sharable Content Object Reference Model (SCORM) and particularly the reuse of resources (Del Blanco, Á. et al. 2013), which might be coincided with recycling concept (Yuan, X.; Zuo, J 2013), one of the most common ways of activating SD concepts.

The most important organizations that work on the development of the e-Learning’s standards: 1) The Institute of training by the computer, 2) The Institute of Electrical Engineers and limited Electronics, 3) IMS Global Learning consortium, and 4) Advanced Distributed Learning have stated a set of standards and specifications which include the definition of the communication between the content from the learner's side and
the system that is called the operating environment. The objective of the SCORM's model is summarized in providing general means for an educational content that can be re-used, the model also includes a guide to determine and collect the resources then converting it into an educational content. It refers to a set of standards that achieve the following objectives: (Bohl, O. et al. 2002) (Lin, Y. J. et al. 2005) (Zhu, F. et al. 2007) (Chang, W. C. et al. 2007) (Hsu, Y. C. et al. 2010)

1- Accessibility: determine the location and access the educational content in any place and at any time.

2- Adaptability: the ability to increase productivity and efficiency by reducing time and cost of education's delivery.

3- Durability: using the content even if the used technology is changed such as updating the operating systems.

4- Interoperability: the communication between the operating platforms and the different tools and working together efficiently.

5- Reusability: editing the content easily and using it several times.

6- Affordability: increasing learning efficiency and productivity while reducing time and costs.

It is obvious that the fifth standard is consistent with the recycling concept, which is one of the sustainable development principles. That shows the rationality of the present study.

**Significance of the study:**

1- Re-organizing the content of three courses: photography, multimedia design, and projectors (presentation devices), and to include the concepts of sustainable development into them.

2- Changing the teaching ways of the three subjects to be depending on projects and problems' solutions instead of the traditional ways.

3- Developing the students' practical skills and converting the learning's results into tangible results in the output of each project.

4- Developing the student's attitudes toward collaborative work in groups and achieving the specific objectives.

**Study Procedures**

The purpose of this study is reorienting three educational technology courses toward sustainable development and project-based learning. The three courses was Photographing, Projection Devices and Multimedia-Authoring. The targeted skills were investigated with students through their projects in several sessions during the first semester. The researcher’s role was essential for enabling students to move from one phase in every project to another in the three reoriented courses toward ESD. So, the whole process should be activated by:

A. Posing every project objectives in the context of every course to students.

B. Sharing discussions and launching points with the students.

C. Encouraging students to suggest ideas or posing community problems which need to handle within a project in photographing, multimedia authoring or projection devices course.

D. Helping students to Construct the required procedures for every project.

E. Giving students feedback on their participation inside university or on the learning wiki-platform in an attempt to unify their ideas.

F. Managing the discussions among students and encouraging them to pose relevant questions to every session topic.

G. Directing the students’ attention to obtain solutions for every problem they face during every project face-to-face or online sessions.

H. Encouraging students to give reports and explanations for their activities.

I. Supporting students in organising a gallery for their photographing project and a students’ conference to demonstrate their
In Ismailia, Egypt. At the educational technology branch, faculty of education, Suez Canal University, the researcher has divided 74 students into three groups, with three projects, as the members of the first group have participated in the project of the civilized model for the Egyptian city between reality and what is required, using in this survey what they have learned about the art of photography for taking photos for the environmental problems in the city. Then suggesting available solutions by processing and editing the photos that represent uncivilized model or accumulated waste and garbage, using Adobe Photoshops for photo processing and making a comparison between what is already existed in the real life and what should be in an album designed by them.

The students also have organized a gallery for their photos; with considering the standards of high quality photographing. The second group has designed a multimedia presentation using Adobe Program for educating their colleagues, which is a necessary to keep the public places as well as the gardens of their university clean regarding the design standards of the multimedia programs. The third group has carried out a project for reutilization of the damaged devices, instead of scraping them off, and they created untraditional uses and solutions for them according to the content of projection devices’ subjects.

Then, the students have presented their projects in a Student Conference attended by 350 participants from inside and outside the university. In the following are some examples from the working sessions and the results of the student’s projects in the three reoriented educational technology courses, which is Photographing, Multimedia authoring, and Projection devices.

In the following are some examples of the targeted skills in photographing and image processing course:

  To increase zoom range and setup a tripod.

  To backup images while traveling.

To adjust the ISO and sensitivity settings of the digital camera.

To set the camera to series exposure, rather than single one.

To use the adobe RGB as the default settings for the camera.

To focus on a specific part of the subject.

To refine the exposure technique.

To decide when and how to use the zoom.

To avoid using the digital zoom whenever possible.

To know how to fill the frame.

To keep moving while searching for viewpoints.

To use framing devices/objects such as doorways.

To enclose the main subject in a frame.

To decide how to freeze a moment of time.

To use flash in the very bright condition to reduce shadows.

To use modern software to reproduce images. (Ang, T. 2009) (Moss, L. 2010)
Fig. 1. A photo captured and reproduced using Adobe Photoshop.

Fig. 2. The students collaborated in implementing the suggested treatments.

Fig. 3. A garden gallery organized by the students for their captured photos.
Results and Discussion
The results showed the learning tangible outputs in the three projects which reflected the improvement of students’ skills in addition to the skills of working in projects. The results also showed the students' positive attitudes toward linking the three subjects with their experience and daily environmental problems which are related to the concept of sustainable development, and this appears in the following table of the significant responses on a questionnaire about the attitudes toward the learning situations of the education technology skills and knowledge, and using them for the sustainable development for their society and environment. The most significant indications and meaning parts of the questionnaire was the students' responses to the following items between agree and strongly agree:

This was obvious from the examples of what the students achieved in the three subjects that were reoriented towards sustainable development. Through reviewing students' results in the exams of the three subjects and also conducting questionnaire about their attitude towards these subjects, it was clear that their understanding of the concepts of the three subjects was improved and their skills in projects were enhanced. Results also showed a positive change in their attitude towards subject matters and awareness of associating such subjects with sustainable development concepts.

The Study Recommendations:
1- The need to reorienting courses in educational technology branch to include the ESD concepts.
2- Carrying out studies for developing educational technology courses.
3- Focus on making the learning objectives and its results tangible and resolving environmental and social problems.
Table 1. Students responses on the most significant items of the questionnaire.

<table>
<thead>
<tr>
<th>Items</th>
<th>Of 74 students</th>
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<tr>
<td>It gave me a lot pleasure to participate in the projects with my colleagues</td>
<td>71 (96%)</td>
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<td>I have never forget the information that I gained during every project any more</td>
<td>68 (92%)</td>
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<tr>
<td>I have collaborated with my colleagues in achieving the project's objectives</td>
<td>73 (99%)</td>
</tr>
<tr>
<td>I have gained more confidence in my ability to gain information</td>
<td>70 (95%)</td>
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<tr>
<td>I felt the importance of what I have learned in my daily life.</td>
<td>73 (99%)</td>
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<td>My learning motivations have been increased due to the existence of a tangible goal at the end of every project.</td>
<td>67 (91%)</td>
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References


