

WWW @ E-LEARNING AND HUMAN SUSTAINABILITY

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The improvement of a country's human resource capacity for productivity is a pre-requisite for social and economic development UNESCO's 1993 World Education Report shows that opportunities for higher (tertiary level) education vary greatly in Africa. They range from enrolments of 1698 per 100,000 inhabitants in Egypt to 16 per 100,000 in Mozambique. In the francophone countries, the range goes from 958 in Morocco to 50 per 100,000 in Rwanda. Not surprisingly, there is a clear correlation between economic development and the number of students enrolled in higher education. There are a number of countries where low levels of education are accompanied by per capita annual incomes of below US\$ 500. This includes much of Sub-Saharan Africa

Higher education in Africa is facing a critical challenge to meet new demands for the 21st century, with its ever increasing population growth. This means that those seeking access to education at all levels - primary, secondary, and tertiary - will increase. In spite of this fact, educational institutions in Africa are not expanding enough to accommodate the increasing number of students who'll be seeking access to higher education. Africa need an educational environment that would make it more responsive to challenges confronting the continent. Alternative ways of providing access to higher education via distance education need to be fully explored. Distance education makes it possible for students anywhere who have Internet and Web connections to enroll in online courses.

This article focuses on discusses the growing application of information communications technologies the main features, factors, roles, and characteristics that prompt effective web-based online courses delivery. The online environment offers unprecedented opportunities for people who would otherwise have limited access to education, as well as a new paradigm for educators in which dynamic courses of highest quality can be developed. It describes the virtual classroom, where "bricks and mortar are quickly being clicks and pointers", the virtual professor who becomes a "guide on the side", helping students to discover and synthesize the learning material, instead of just being a "sage on the stage". It also assumes that the successful online student must have an active role in the Virtual Classroom and understand the important characteristics necessary for him to succeed. It also focuses on the importance of collaborative learning activities in the web-based online education.

Keywords: *Web Technology, Web-Based Online education, Distant Learning, Virtual, Collaborative Learning.*

Why is the Web-Based Educational Technology?

The explosive growth of computers is not the only factor contributing to the increase in distance education via the Internet, but also it is due to the fact that the access to the Internet is now relatively inexpensive for many users and the software used to access information on the World Wide Web as well as to develop courses for delivery via the Internet can be obtained free or at a low cost. This easy inexpensive access for learners and educators makes the Internet one of the educators (McManus, 1 997). One of the goals of online learning is to mix between technology and pedagogy that suits a particular objective and preferred technology style.

There are many valid reasons why online web-based education programs are rapidly becoming a popular form of education. The web-based online education is a valuable tool to help students learn without being on campus. It is a formal educational process that breaks the mold of traditional classroom.

There are two main differences between traditional education and online web-based education. Online education adds flexibility and availability regardless of time, place, or pace of learning. An instructor teaches, and somewhere a student learns, regardless of barriers of time or place. Web-based online education makes education more attainable by more people. It provides educational opportunities for those who are unable to attend schools or colleges because of cultural, economic, traditional, religious, or geographical barriers, or due to personal challenges. It reaches out to non-traditional students who must or like to fit their studies around workplace and family responsibilities.

The students can be at satellite campuses, at the workplace, or at home. Instruction may take place in real time (synchronous) or on a time-delayed basis (asynchronous). Interactivity between students and instructor, as well as among students themselves, can be built into the program.

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Who Would Benefit From the Web-Based Online Education?

Web-based online education makes education more attainable by more people. It provides educational opportunities for those who are unable to attend schools or colleges because of cultural, economic, traditional, religious, or geographical barriers, or due to personal challenges. It reaches out to non-traditional students who must or like to fit their studies around workplace and family responsibilities. It also meets the interest for those who like to enroll in postgraduate studies without being physically in a campus. Postgraduates can also attend national, regional, and international conferences, meetings, seminars, round table discussions, or any similar activities, without leaving or traveling from their countries. The upgrading and development of education result in economic, industrial, social, and human sustainability

Both traditional and non-traditional students highly benefit from distance education. They benefit from the flexibility, interactivity, facilities, and technological enhancements that characterize the well designed and planned online web-based education courses. The most effective online education courses should possess special design features that take advantage of medium of distribution and the nature of subject taught. The most important part of the web-based education is to allow the interactivity between instructors and students and among students as a group. There are a number of support technologies that allow interactivity in the web-based online education, such as electronic bulletin board, Internet, chat groups, e-mail, and others. They allow and facilitate open discussions, questions and answers, group projects, homework assignments,

exams, and advising and consulting. Class notes and other course materials, as syllabi can be located on a web site.

Instructions are delivered using a number of technologies, depending on what is most appropriate for the subject and the targeted group of students.

Audio technologies such as telephone conference calls or radio allow synchronous delivery of instruction to all students.

Video technologies such as videotape, compressed digital video, cable, or satellite delivered programming add more flexibility and sophistication to instructional design.

Computer-based learning technologies such as CD-ROM, the Internet, and desktop videoconferencing make tailoring individual instruction efficient and effective. Support technologies such as e-mail, fax, telephone, and World Wide Web facilitate interactivity, even in totally asynchronous delivery systems.

What Makes Web-Based Online Education Successful?

Online curriculum

Online curriculum should focus on application of knowledge to the real world and foster critical thinking skills with opportunities for an interchange of ideas among students and with the facilitator

Collaborative Interaction

The most important element for a successful online education is the interaction among participants. The course design should be based on the principles of collaborative learning and active participation, as well as sharing of thoughts and problem solving.

It is the instructor's role, as a facilitator, to ensure that a high level interaction occurs in the online course.

The simplest technique is to have students complete regular assignments that consist of answers to problems or questions posted by the instructor. If these responses are posted publicly so that everyone in the class can read, this will provide a basis for sharing ideas and discussions among participants. Sharing of ideas is considered as one of the most powerful aspects of online education.

A more powerful form of interaction is group activity, in which students are divided into small groups, working together either for the full duration of the course, or they can be short-term for the completion of a particular assignment.

In a collaborative team project, participants will critique the appropriateness of specific technologies with respect to curriculum and course objectives in selected online courses.

The group will prepare a collaborative critique and submit it to the class discussion forum for review by other class members (collaborative assignment).

Online curriculum must reflect the use of dialogs among participants, in the form of written communication, and group interaction, and participation. Telecommunication is a potentially powerful tool to support such collaboration, since it allows participations to be creative thinkers, problem solvers, risk takers, and innovators.

The Collaborative Learning

Collaborative learning provides an environment to enliven and enrich the learning process.

The cooperative efforts of the participants create an enhanced combined effect compared to the sum of their individual effects, i.e., synergy is highly conducive to learning. In fact, the synergy of the discussion is one of the most important learning tools of online courses.

The synergy generated through the online dialog is the most important learning tools in the online environments and has an impact on defining the learning outcomes. It allows students to share and receive different views/opinions. Learning in different views and opinions creates various levels of awareness. Online class discussions provide students with opportunity to view, critique and comment on the work of other students, so that it has a role in their constructive cognitive development. Also it presents an environment in which a student interacts with one or more collaborating peers to solve a given problem. The interactions among the students are monitored and controlled by a collaborative learning system. It concentrates on refining and integrating the learning process and the subject knowledge of the students, with the help of the collaborative partners. The synergy that exists in the student-centered Virtual Classroom makes students learn from the experience of others, having additional information about the subject matter.

Moreover, students who participate in discussions are “proactive learners”, Pitt and Clark in *Creating Powerful Online Multiple Instructional Strategies*”, concluded that proactive learners learn more, learn better, have greater motivation and retain knowledge longer than reactive learners. The process of discussion online prompts proactive learning. Moreover, the asynchronous discussion structure makes the learner to be able to reflect carefully on each comment from the other before responding or moving on to the next item. This allows students to articulate response with much more depth and forethought than in a traditional face-to-face discussion situation where the participant must analyze the comments of another on the spot and formulate a response or otherwise lose the chance to contribute to the discussion.

Successful Online Virtual Classroom (Web-Based Classrooms)

To develop a Virtual Classroom (Web-Based Classroom) we should have enough student number, access with hardware and the Internet. Estimate the overall development cost and effort. Deliver good quality of the Web-courses using the most effective communication tools between the instructor and students, or among students themselves.

Successful Online Virtual Professor: The Facilitator

The Virtual Professor is now called the facilitator, since he becomes facilitator in learning, more than transmitter of knowledge. In preparing to teach an online web-base course, the instructor must not only be familiar with the technology, but also must have a strong sense of the dynamics of the online classrooms. In a truly successful online course, where discussion and collaborative learning provide the basis for content delivery, facilitator has the major role and students are the main players. Usually the facilitator has the powerful influence on the success or failure of the program. His attitude, personality, behavior, and training are important components in the learning environment. In planning content for an online course, reusability of the material should be considered. The instructor can retain a control over the important aspects in the course, while allowing the student to control his/her own learning experience so that student becomes more autonomous and responsible for his/her own learning, The Virtual Professor becomes a “guide on the side”, helping students to discover and synthesize the learning material, instead of just being a “sage on the stage”.

Online instructors play a variety of roles in the Virtual Classrooms. They should have a clear plan of which role they will take. This plan should be adhered to throughout the course. The various roles differ in the levels and types of participation, which in turn affects the types of dialogue that occur in the classroom. The facilitator must believe in the effectiveness of the online paradigm and the value of critical thinking. The facilitator must consider the unique aspects of online learning as he designs the online curriculum, which is critical factor. The curriculum is adapted

using the available technologies to produce the end result of achievement of web-based learning objectives.

Faculty Training to Teach Online

Teaching online is not the same as teaching face to face. The skills that are valued in the face-to-face environment are not used in teaching online. To become skillful and successful, faculty must learn what skills are needed and how to develop them. The best way to learn to teach online is to be a student in an online training class. However, most faculties can learn the basic skills by participating in hands-on training sessions in a computer lab where they examine and critique existing online courses and learn the principles of high quality online instructional design.

Successful Online Students

The Online student must assume an active role in the Virtual Classroom and understand the important characteristics necessary to succeed. He should be willing to contribute to the course, to contribute to the group, accessed with the minimum requirements of the equipment and having minimum level of technological experience. He should be mature enough, open-minded, self-motivated, self-disciplined, accepting of critical thinking. Willing to work and share discussions collaboratively, trusting of the online experience, good written communication skills. They acquire high degree of time management skills, in order to keep up with the pace of the course, and to complete the assignments in the due time. Be prepared to accept challenge, and decision-making, to actively participate in the course process, and in the social life, since the Virtual Classroom eliminates the virtual barriers between the classmates. In the Virtual Classrooms, the discriminating factors such as age, race and gender, physical appearance, dress, and disabilities are largely absent.

Student's Support

Some students taking online courses are at risk for not completing their courses. There are several reasons for low retention rates. Low retention is associated with the degree of motivation for learning. Young students in particular are often not highly self motivated, may find it difficult to complete work sitting in front of a computer. Students are accustomed to learning through human contact. Without the physical force of the instructor, students are often not motivated to study. It is much easier to not complete assignments than when students must explain their lack of work to a live instructor. Because of this, there should be a teaching assistant in the valley who can encourage students and provide a live person that they can ask for advice and assistance.

Students must have an orientation to how online courses operate, how the software works, what is required of them. The orientation must be required of all students. Success rates for students who have not passed through an orientation are low. An assistant can conduct the orientation in a computer lab, or it can be conducted online. Most successful orientations allow students to use the course management system, take a sample quiz and practice accessing information, as well as provide them with information about what is required for success in the online environment.

There must be some method for students to receive technical assistance. When they forget their passwords, or have other difficulties, there must be an assistant available by email or in the computer lab that can provide help. Otherwise students will lose study time, fall behind, and ultimately fail to complete the course.

The successful Online Course

The course should be effectively designed and clearly articulated to meet the particular online learning goals and objectives. It should be designed in a completely online format, using variety of interactive modalities, allows maximum advantage of the collaborative nature of the online environment, i.e., clearly structured to facilitate collaborative learning, classmates interaction, electronic discussions, chatrooms, group discussion, e-mail.

Online Course Development

Knowledge of appropriate pedagogy and instructional design are the most important ingredient to help faculty develop high quality online courses.

Online course preparation is more intensive than in a live course and this is an essential topic in any online instructor development

How to Design an Online Course?

The entire course content should be designed in a completely online format, using a variety of interactive modalities required for a successful online course, such as: links to related web sites, full class conferencing for entire class discussions, small group conferencing around group exercises, electronic communications among students themselves and students with the instructors, assessments questions, and electronic submission of individuals and group assignments. It should be also delivered smoothly and friendly over the worldwide web.

The course shell can be used as a stand-alone course or to supplement a face-to-face course, or as the Course Description states.

The most important information related to the online course is the course news and syllabus.

The syllabus should provide detailed information about its organizational and operational aspects, such as, instructor, course description, course objectives, key information, posting messages and assignments, final grade components which based on a combination of individual and group assignments, reading assignments, start-up tips, how it works (tutors) and course schedule. Students should be aware why it is useful to be delivered as an online material.

The course can be designed to include various modules, graphics, images, animations, audio-visual materials, (video clips), etc. It can offer resources at various Internet web sites about the course.

The multiple course links and resources seem to be an enhancement over what one would likely find in the equivalent face-to-face course.

Online Course Management

Online course management is an important area to include. Online course management really does present different problems than those even experienced instructors are used to have on a live campus or even in televised distance courses.

Organization of materials in the online classroom and the actual procedures for communication is a critical issue. The procedures for communication in online forums, which vary based on the software used, require uniformity or else risk causing complete confusion. Placement of materials and directions for assignments must not only be clear, but even redundant. Weekly updates and summaries are necessary to keep all students up to speed. Tracking of student progress needs to be closely watched -- personal e-mail communication functions in place of telephone and office hours. Instructors must learn to set up e-mail filing and folder systems that will permit them to "see" and differentiate student assignments and student communications among the glut of e-mail that arrives each day.

One or more assistants who are knowledgeable about online pedagogy should be available to help faculty design and create courses. Courses that consist of web pages with lectures only are likely to have very low success rates.

Successful Use of Technology

Successful use of technology is determined by its ease of use, the degree to which it remains a tool rather than the focus of learning and mostly that the technology remains transparent. Technology is a means of to deliver the education, and for successful learning to occur, so that it must be as seamless as possible. Ways to ensure this is that the facilitators must first be comfortable using a particular technology before implementing it in their courses, and that students are required to participate in an orientation program before the course begins in order to be familiarized themselves with the tools that will be used in this course.

Another technological issue that must be addressed is that the technology used to deliver instruction must accommodate the lowest common dominator in the class. Equity of access to technology should be taken into consideration when designing distance-learning courses.

Finally, technical support is vital to the success of an online course. The facilitator can be well trained; the curriculum in place, and the student willing, but the system malfunctions, and both the student and the instructor need to know where to turn for help. Technical issues should not interfere with the learning process.

Author's Experience in Developing a Bilingual (English-Arabic) Course in Chemistry

I had the opportunity to develop an online bilingual (English-Arabic) course in Chemistry, using the full package WebCT and other software needed. Its URL is:

<http://pentane.chem.uiuc.edu:8900>

It includes, text, 3D graphics, animation, evaluated self-tests with model answers, graded Quizzes with model answers and evaluation, Glossary, Bulletin Board, Chat Room, WhiteBoard, and e-mail address.

Also, as a consultant for the Minister of Education to upgrade and improve education using the new technologies, I led a group in the Egyptian Ministry of Education (**EMOE**) to installed **Centra Software** for schools Management, e-government, and to deliver Online Courses to the preparatory School students. It includes Virtual Classrooms, Synchronous and Asynchronous education, Whiteboard, collaborative discussions, self-paced education, audio/video discussions, and e-mailing. Its URL is:

<http://elearning.emoe.org>

Distance education is very important for the distribution of alternate, balanced and equitable portrayals of women and their potential

Women in the Middle East who the Web-Based Online courses, especially the bilingual ones, would definitely benefit, enhance, improve, and develop their skills in science and technology.

We can say “**Web-Based Online** education makes education available to all **who** desire it **whenever** and **wherever** they look for it.

A selection of standard full credit undergraduate and graduate courses is offered globally through the **World Wide Web**. Students can apply for one of the remote universities, register for courses, and complete course work electronically.

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