TOWARDS MORE EFFECTIVE INSTRUCTIONAL USES OF TECHNOLOGY: THE SHIFT TO VIRTUAL LEARNING

By Dr. CARMENCITA L. CASTOLO
Subject Specialist, Poly Technic University of Philippines

Introduction

"The world is undergoing a revolution." Technology is revolutionizing our field in education by altering its structure disregarding institutional walls, developing new ways to access information, solve problems and collaborate. We have heard this before but not enough to prompt us into action. We are under revolution, but this time, with much fervor let us become active participants to this revolution.

When we talk about a revolution, this refers to the drastic changes our society is undergoing. There is the phenomenon of integration of economies, the advent of information society, the rise of the digital industry and the new global order; all these propelled by the convergence of various information and communication technologies. We are beyond the threshold of a new age in which we will live, work, and learn differently from the past.

The new challenge is to determine the best way as to how the new economy can put the people's welfare foremost in this move towards digital revolution. It is education which is relied upon to play an essential role in wealth creation and competitiveness. The bottom line of this effort is the pursuit of human development. Education is the one depended upon to produce empowered citizens and an educated work force that is ready to man the knowledge economy. Fortunately, the education sector has geared up to this formidable task. For one, it has adopted a new education philosophy, one that is able to service the needs of the globalized world. This includes the recognition of education-for-all policy, the multiple intelligences' concept. Life-long and perpetual learning and now learning to live together. Combined, this translates to the commitment to extend educational opportunities to everybody, young and old; the recognition of the uniqueness of individuals, the complex and ever growing fields of knowledge; and the need to learn every time, anytime, anyhow, and anywhere.

What is Information and Communication Technology ?

Information and Communication Technology refers to the whole gamut of Information and Communication Technologies from Computing, Hardware and peripherals, Physical Infrastructure, Personal Computers, System Software, Application Software, Database Management Systems, Applications Development Tools, Computer Aided Learning and Teaching Systems, Document Management, Imaging Systems, Electronic Publishing, Multi-media Technology, Data and Voice Communication systems, E-mail, Personal productivity tools, E-commerce, Internet, Intranet, Extranet, Web based Development, LANs, WANs, Satellite services, Wireless Networks, Telephone and PABX systems, Voice Mail, Video Conferencing, Audio Visual Networks, Cell phones, Projector, Fax Machines, TV and VHS presentation, Multimedia and computers, Handy camera, TV and Radio Broadcast and others.

These are diverse technologies that can be used not only for business and everyday life, but for the education sector as well.

Most literature dealing with education nowadays speaks of the changes of happenings in education as brought about by the developments in Information and Communication Technologies (ICT). Aside from providing benefits to the traditional education system, mostly by,

offering better format of multimedia technologies used inside the classroom, the most profound effect of the convergence of various ICT has been the creation of another world, the electronic world, where, among other activities, education has been one of its more beneficial activities. Aside from creating virtual universities, on-line education and other web-enables strategies in both traditional and distance education came about.

The Role of Educational Institutions in the 21st Century

With all these developments the role of educational institutions is fastly changing. There is a need for new organizational structures for educational institutions to provide the administrative and educational support for lifelong learners. The critical roles of an electronic educational institution are to build and meet the learning needs of the 21st century, such as follows:

1.To provide information on education and training needs and opportunities.

2. To provide quality control

3.To develop coherent curricula, where appropriate

4. To broker and validate courses and materials from other education and training suppliers

5. To provide the service that will make it easy and user-friendly the use of communications to import and export multi-media learning materials

6. To network learners and instructors

7.To create high quality educational multi-media materials in an easily accessible for

8.To conduct research into education and training needs

9.To apply new technologies, as they develop, to education and training, and to evaluate their use.

Benefits of ICT-enabled Education

- Technology offers great opportunities to reform and improve education
- Technology is an integral part of today's global society
- Technology does not replace a good teacher but instead enhances their abilities and capabilities
- New technologies will enable teachers to teach more effectively and enhance student learning in remarkable ways
- Computers, like books, are another evolution of instructional technology
- Technology's major purpose is to improve learning and not create a new content area
- Technology can be integrated across all curriculum areas
- Technology-use in the curriculum reflects the changing needs of students and the new expectations of society
- Technology awareness/proficiency should be considered when hiring new faculty, staff or administrators
- Technology will improve the productivity of students and educators
- Using technology, schools will provide for the current and future needs of our students
- Schools can use technology to reach for more powerful learning goals and school reform
- Technology will not transform schools, rather school must learn to harness technology will allow them to keep pace with change
- Technology will impact upon the mission of preparing students to be productive citizens in an information-based society
- Technology is an ever-growing resource in media-saturated world and access to information is becoming more swift making schools avid consumers
- Technology will enhance productivity of educators
- Technology improves students' ability to achieve goals and learning outcomes
- Technology reduces long-term costs to achieve goals and learning outcomes

• Technology increases the students' access to learning resources

In the Philippines, many educational institutions are looking at implementing more of these ICT into their education delivery system considering its many benefits. For one, there are many literatures discussing numerous success stories of this ICT-enabled education models particularly the one which are coursed through the Internet. Another is the official figures citing the growth of web-enabled education abroad, the published cost-effectiveness of this system and the potential of this kind of education delivery to provide an education that is fit for the globalized world.

Contrary to the usual notion that only those under the virtual university system can make use of web-enabled strategies to strengthen their programs, the different kinds of education delivery models, from the traditional classroom based mode to the open and distance learning systems can now make use of ICT and particularly the web-enabled strategies in order to strengthen their delivery system.

The Internet, for example can supplement the traditional education delivery system by making use of its features. For example, a teacher can now incorporate the following; conferencing, electronic mail, Internet mailing list, Usenet Newsgroup, Chat rooms, Bulletin boards, Video Conferencing, on-line discussion groups where advising and counseling, career exploration, placement services, peer support groups, training, submission of course requirements, student evaluation, on-line help and tutoring, course evaluation can be provided. There are also library catalogs, electronic reserves, on-line indexes and databases available in the World Wide Web. This range of applications and systems solutions support on-line as well as off-line educational activities.

The Polytechnic University of the Philippines (PUP), one of the country's biggest universities in terms of student populations, is also going the way of implementing ICT in its system not only to support teaching and learning but also its administrative components. Consequently, it is also considering going into on-line education. Initial plans indicate that this may be coursed through existing institutions like the PUP Graduate School, the PUP ICT Center and/or the PUP Open University. Aside from putting in place the infrastructures the current ICT developments in our university secure an overall climate, and ICT infrastructure that works and offers choice and access for all. The teachers, together with the students, are users of these ICT.

The teacher will always be an essential mediator of knowledge and learning skills, but teachers can no longer fulfill their role satisfactorily in the age of ICT without technology-aided learning and the access, which implies to an increasing body resources and techniques. Nevertheless, teachers cannot adopt new techniques with which they are unfamiliar; they cannot teach what they themselves have not learned. Teachers across the boars are in desperate need of training in new media and in new pedagogy. There is currently a bottleneck caused by the lack of teacher training, which inhibits the adoption of ICT. It will not be overcome unless resources are allocated to the teaching profession to equip them to adapt to educational ICT as an integral part of their teaching strategy.

Both education delivery systems are challenged to have the capacity and potential to service the learning needs of the people. Learning institutions are busy making adjustments in their curriculum in order to produce a workforce ready to function and compete in an information society.

What was once the traditional way of what and how people learn is evidently changing. Education now can

be adapted to the unique education needs of a certain sector, group or even individual. There are new funding models available that can sustain the delivery of education and lifelong learning to a fast growing number of individuals. ICT-enabled education is said to be more cost-efficient as it does not need too large space. Moreover, under this mode, education stakeholders are more free to adjust to their new roles and experiences in innovating systems as they work together to solve common challenges. For example, collaboration among various education stakeholders produces a series of partnerships and clusters of alliances between different types of organizations. These institutions combine their resources to facilitate delivery of education. Already, even traditional schools are seeking out to develop out consortia to deliver and develop programs by a variety of non-traditional means.

The fact that education now is technology-driven, it provides liberal possibilities for its adoption simultaneously with development of information communication technologies. This includes technologies such as print based materials which trace their origin from the development of the printing press in 1445, telephone in 1917, television in 1927, transistor radio in 1964, the first commercially available personal computers in 1974, the invention of modem in 1978 and since then the convergence of these telecommunication technologies which has further spawned various media formats.

Today, we have the print, television, radio, PC, telephone, multi-media CDs, Internet, DVD technology and digital interactive television audio and videotapes. diskettes, CD-ROMs, DVDs, online via Intranets and the Internet as well as broadcast via TV platforms, and many hybrid formats. Now and increasingly in the future, education will be delivered via the telephone, the TV screen, the PC, and a variety of new electronic delivery devices.

Among all these technologies, the trend now for most education institutions is to use the Internet system. The Internet is projected to become the dominant distribution system for education and training. The Internet is a "mega network of interconnected networks that share a common language". It is an electronic world connecting computers, which now comprise a massive network. The hypertext feature of Internet allowed the linking of files, which resulted in organized information from different sources being made available with just a click of a mouse. Its major browser, the World Wide Web, an Internet application and an all-purpose tool enabled the integration of graphics, photographs, audio and video in the system. These multiple capabilities of Internet and a lot mote are the reasons for its potential to bring education to many in the future.

For one, the world is becoming more inter-related and inter-dependent given the increase of digital communication networks that will soon cover the entire globe. Already, the countries are busy putting up the infrastructures to make this a reality. Worldwide investment in telecommunications infrastructure alone is expected to exceed US$200 billion by 2004 (ITU). Every country is working towards wiring up and this includes provision of IT equipment and Internet connections in the libraries, schools, colleges, and universities. More significant, in the more advanced countries, is that the concern now is no longer that access issue or provision of the computers and the networked environments to many of the people, but towards the quality of content on-line. This means that they have moved up from ensuring the infrastructures to delivering high quality products and services via the Internet.

Many also believe in the potential of Internet given the rapid increase of people becoming increasingly connected to digital networks compared to the slower

reach and access of other technologies. For example, Internet reached an audience of 50 million in only its fourth year, while radio took 38 years and television 40 years to achieve the same.

In addition, learners who live in the period undergoing a fast paced societal transformation want to access education a variety of new ways. This is because under the new global order, individuals could no longer expect to stay in one job in his lifetime. That job mobility is likely to happen for majority of the people calls for frequent training and re-training. Internet answers to this problem because it has the ability to converge the printed, visual and audio technology, delivering education in a networked mixed-media environment. Internet and multi-media provides a different way in which learning materials are created and delivered. It can deliver updated information materials using comprehensive media and delivery platforms depending on the needs of different markets. It has its own world of information, the size and breadth of which is increasing every day. Thus, learners have greater access to quality learning materials.

Internet also has the potential for delivering a course that is smaller, and under funded; and to reach out to traditional areas and beyond. It is also a good distribution format as it can provide the head start for those who want to start learning early, for adults attempting to complete study, and to anybody who was previously excluded from educational opportunities. It can readily and more efficiently customize learning materials to suit different learning styles. The available materials in Internet are more fun particularly the interactive ones which feature simulations, animation and direct participation in an experiment or activity. Students can learn at their won pace and convenience because they can access the education anytime and anywhere (it is available 24 hours a day) where there are computers linked to the Internet. Another great feature of the Internet is it potential to solve the access, equity, and gender issues in education. When the students sit across the computer it does not register its socio-economic status, gender, appearance, handicap, inflexion, and many others. Shy or introverted, and any student are on equal ground with everybody. The increasing population of students from basic to university levels and the perennial problem of scarcity of space and resources also point towards the use of Internet in the education system. Add to this the growing expense of traditional education amidst the savings on travel and other costs and convenience offered by on-line learning.

Another positive development is the growing E-commerce applications, which comes with it the evolution and its services. This increases the functionality and attractiveness of going on-line. Thus, people will be more inclined to log on not only educate themselves but also avail of a host of products and services that can be accessed in the internet. For example, the internet has sites the provide free international calls, download important information, free text, ring tones and logos for cell phones, free e-mail and many others. The more time one spends on-line, the greater possibility that the individual would seek to learn electronically. And when a student gets his education via the Internet, he will have the skills at using whatever is available on-line, increasing also his chance of employment in the knowledge economy or entrepreneurial venture after and even before he graduates.

More specifically, Internet had been the choice distribution system of recent education implementers because it is complementary to the student-centered drive of education philosophy totally improving the traditional means of learning. It provides coaching instead of lecturing, logging on instead of taking attendance, connected learning instead of distribution requirements, puts premium on performance standards rather than credit hours, encourage collaborating instead

of competing, provides information network connection instead of library collections, promotes active learning instead of passive learning and availability of customized materials rather than bulky or dated textbooks.

Recommendations

At our own university, the PUP, a conscious effort of adopting these ICT into our overall education system is evident in our recent undertakings. We have put substance to our advocacy for the implementation of ICT-enabled education by putting in place relevant ICT projects.

We have started with the establishment of our PUP Information and Communication Center that has generated consequent ICT related programs and projects within and outside the university. Only a few months old, it is considered as one of the best and latest ICT centers in the country. The PUP ICT has more then 100 computers, 3 function rooms and multimedia centers and state of the art ICT equipment. It is an Internet service provider, an ICT training institution, software developer and research center. Its activities include support to electronically-mediated education, research and development in ICT efforts to develop, test, prototype, and incubate ICT enterprises, provision of Internet access for student and faculty, training on basic and advanced courses to include web page development, productivity tools, software development, production of on-line training and courses, campus connectivity, development of multimedia instructional systems and support to the university and the PUP Open University operations and development.

The distinction garnered by our PUP ICT center includes:

1. PUP is recognized by CHED as one of the Centers for Development of Excellence (CODE) in ICT.

2. PUP is recognized by Microsoft and declared PUP-ICTC as the first Government Technology Education Center (GTEC). PUP-ICTC is authorized to administer certification exams for Microsoft solutions.

3. DOST included PUP as one of the Virtual Centers for Technology Innovation in IT (VCTI-IT).

4. It is one of the implementing institutions of DOST ICT program that will undertake research, technology transfer and other advanced technology fields in line with goals of the national agenda for 2000 to 2004. The project will include support to further research and development programs of students, academicians, and IT practitioners.

More than all these infrastructures, we have chosen to address the directional and motivational dimension in our bid to computerize. Meanwhile, the do-ablest, or those things that we can do now without needing for massive funding, are now being implemented, this include the:

a) Training of our faculty not only to learn computer operation as well as relevant software like Word, PowerPoint, and Excel as well as to surf the Internet. There is also more advanced training like the Tool Book II which trains them to convert their printed modules into a multimedia CD format.

b) Regular ICT updates are provided to the PUP community in order for them to actively engage in the lively discussion on the technology issues and to be aware of the trends of ICT.

c) Internet access for college offices are now in place. We believe that putting these technologies into the hands of our community is the best way to encourage them to incorporate ICT into their teaching.

Conclusions

Technology, whether or not we are ready for it, is changing the way we work. Contemporary students, who are technologically savvy than those of the past, demand pedagogical change. Technology has already changed the educational environment in which we teach in ways that instructors must recognize and address. Expectations

regarding the role of instructional technology will continue to grow as new technologies emerge. Along with this, new instructors will create and implement new pedagogical models that will better capture students' mastery of course objectives made possible by high-powered technology. So, the challenge is here, the challenge is ours. It is now or never.

References:

A University-Wide Strategy for Information Technology, Project Charter, Monash University, February 2000 version.

Bates, Tony (2000), "Educational Multimedia in a Networked Society".

Bates, Tony (1997). "Reconstructing the University for Technological Change", The University of British Columbia.

Boettcher, Judith V. "Distance Learning: Looking into the Crystal Ball," Florida State University, 1996.

Castolo, Carmencita L. "The Readiness of the PUP Open University Administrators and Subject Facilitators in ICT-Enabled Distance Education", Research Paper presented to the CRIDALA 2001, OUHK, Hong Kong, June 2002.

Chute, A.G., Thompson, M.M. and Hancock, B.W. "The McGraw Hill Handbook of Distance Learning, 1999, McGraw Hill, USA.

Simonson, Michael, et. al. "Teaching and Learning at a Distance", Foundations of Distance Education, 2000.

Wiseman, Douglas C. "Research Strategies for Education", 1999.

ABOUT THE AUTHOR

Dr. CARMENCITA L. CASTOLO

She is a subject specialist at the Poly Technic University of Philippines, Open university.