ROLE OF TECHNOLOGY AND MEDIA IN TERTIARY EDUCATION: AN OVERVIEW

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Abstract

It seems traditional training methods are no longer able to satisfy learners' learning needs and experiences. Although most of today's learners use some form of information technology in their learning, they are actively encouraging their learning environments to be value-adding and more stimulating. Tomorrow's learners will demand access to more technological and media resources and will depend on their university's ability to deliver.

This introductory presentation explores the reason why tertiary institutions should be actively involved with electronic learning and information technology. The advantages of asynchronous and synchronous instructions are addressed while the communication profiles of developing, least developed and selected Southern African countries are mentioned. Special attention is given to some factors which inhibit electronic learning at our tertiary institutions. Finally, recommendations are made for the optimal use of information technology to enhance learners' learning experiences.

1. INTRODUCTION

Electronic learning (e-learning) can be broadly defined as the use of various forms of technology and media (information and communication technology) for on-line delivery of educational courses as part of traditional on-campus provision, for distance learning or as part of corporate training (Lewis, 2002:50). Examples of information and communication technology (ICT) include videotape and clips, Internet resources, Web CT, electronic discussions via e-mail, computer simulations, electronic presentations using a PC and video conferencing.

It seems today's learners are markedly different from those of the past. Influenced by a lifetime surrounded by media, computers and the Internet, they bring with them different expectations. As educators, we need to meet these expectations in order to motivate learners to move forward. One way to facilitate this movement is to use ICT as a teaching tool, so that learners, in turn, learn how to use ICT most effectively (Huang, 2004:734).

2. WHY DO WE HAVE TO BE CONCERNED ABOUT ICT IN LEARNING?

The following are three of the many reasons why we have to consider using ICT in education:

2.1   Knowledge explosion

We find ourselves currently amidst a knowledge explosion. The pace at which new knowledge is currently being created is literally mind-numbing. Consider figure 1.
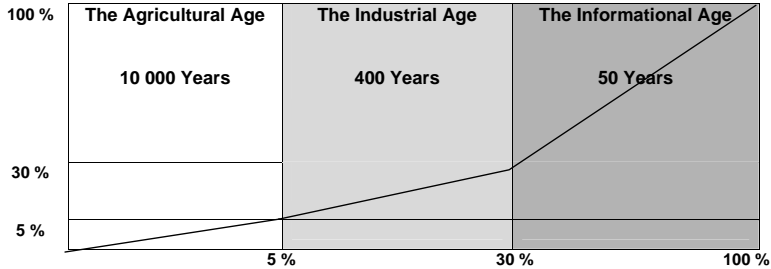

Figure 1: Learning Curve in the Information Age (Piskurich, 2003:156)

The figure depicts the increase in man's knowledge across the Agricultural Age, 10 000 years in length, the Industrial Age, 400 years in length and the beginning of the Information Age. It illustrates the rapid increase in the amount of knowledge possessed by mankind. Only 5 percent of the world's knowledge was acquired in the first 10 000 years. During this period the acquisition of knowledge can be described as occurring at a gradual, slow pace. During the four hundred years of the Industrial Age another 25 percent of the world's knowledge was acquired. Five times more knowledge was acquired in one twenty-fifth of the time. Thus, the pace of change during the Industrial Age can be described as occurring 125 times faster than it did during the Agricultural Age. However, in just the last fifty years, 70 percent of the world's knowledge was acquired, and the pace at which new knowledge is being produced is increasing – with no slowdown in sight (Piskurich, 2003:156-7).

2.2   Global competitiveness

Regarding education, the present paper-and-classroom age will not lead to South Africa being globally competitive. In the USA it was estimated that there were 1.6 million on-line users (i.e. learners taking at least one on-line course) in 2002. This figure increased with 23 % to 1.9 million on-line learners in 2003 and with another 25 % to 2.6 million in 2004 (Allen & Seaman, 2004:5). Thus, for South Africa to be on the same par as other countries where education is concerned, new delivery systems (e.g. the Internet) should be constantly explored and applied optimally, where possible.
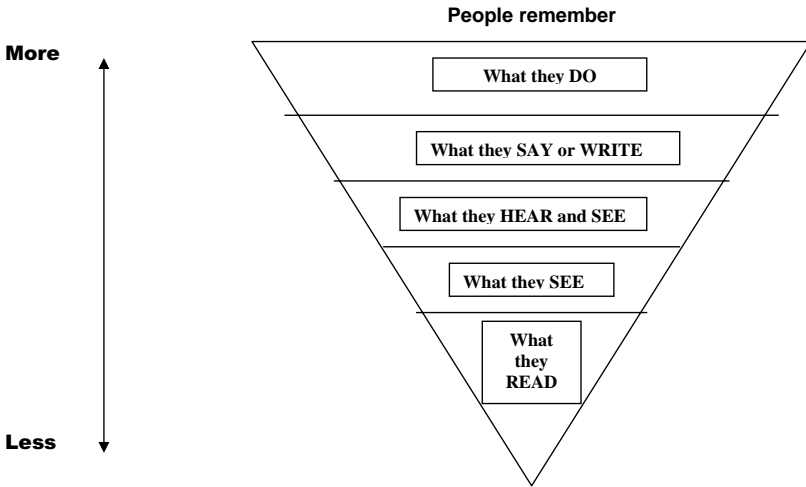
2.3   Different levels of learning

People remember

Figure 2: The level of learning (Van Dam, 2004: 46)

According to figure 2, learners remember more what they do than what they say, write, hear, see or read. By incorporating ICT into the learning experience, educators will be able to create more creative and stimulating methods of teaching that support the learning objectives and maximizes the efficiency of the learning experience. Thus, allowing learners to remember more what they do. It seems, using all the potential learning media over the continuum of time, place and interactions, is more powerful than a single classroom event in truly impacting the learner's ability in mastering the course content (Van Dam, 2004:40). This leads to the logical question: what type of learning media to use in which situation?

3.   VARIOUS DELIVERY METHODS OF INFORMATION TECHNOLOGY

The answer lays in the BLEND. E-learning design excellence requires a del berate, explicit choice of the right method for the level of learning desired. Success depends upon choosing the right mix of methods and media to create an effective and engaging learning experience. ICT can be delivered to learners via three methods (Van Dam, 2004:40; Morrison, 2003:6):

- **Face-to-face:** when the educator and learners are together in the same place at the same time.

- **Self-paced e-learning:** this is known as asynchronous learning – learning that takes place anywhere and any time it is needed.

- **Live-e-learning:** also known as synchronous learning - using technology, the educator and learners are together at the same time but are in different locations.

3.1   Asynchronous Delivery

Examples of asynchronous learning include: videotape and clips, Internet and Web-based classes, computer-based training (CBT) e.g. Web CT and e-mail. While materials can be used at the learner's convenience and pace, there is typically little educator-learner or learner-learner interaction.

The following are four crucial advantages to the asynchronous media and these have been arranged in descending order of significance (Robin, 1996):

- *Flexibility* - access to the teaching material (e.g. on the Web, or computer conference discussions) can take place at any time (24 hours of the day, 7 days a week) and from many locations.

- *Time to reflect* - rather than having to react 'on one's feet', asynchronous systems allow the learner time to mull over ideas, check references, refer back to previous messages and take any amount of time to prepare a comment.

- *Situated learning* - because the technology allows access from home and work, the learner can easily integrate the ideas being discussed on the course with the working environment, or access resources on the Internet as required on the job.

- *Cost-effective technology* - text based asynchronous systems require little bandwidth and low end computers to operate and global access is more equable.

3.2   Synchronous learning

An example of synchronous learning is a video conference. Both parties are present – remotely – and spontaneous interaction happens with no time delay. The learner can interrupt the educator to ask for clarification. The educator can ask the virtual class if everyone understands a concept that has just been explained. Usually, synchronous learning happens at a fixed time. Like their

physical counterparts, virtual classes are scheduled – so everyone knows when to 'turn up' (Morrison, 2003:6).

There are four equally compelling advantages to synchronous systems (Robin, 1996):

- *Motivation* - synchronous systems focus the energy of the group, providing motivation to distance learners to keep up with their peers and continue with their studies.

- *Telepresence* - real time interaction with its opportunity to convey tone and nuance helps to develop group cohesion and the sense of being part of a learning community.

- *Good feedback* - synchronous systems provide quick feedback on ideas and support consensus and decision making in group activities, both of which enliven distance education.

- *Pacing* - synchronous events encourage learners to keep up-to-date with the course and provide a discipline to learning which helps people to prioritise their studies.

The flex bility of ICT creates grey areas around the notions of synchronous and asynchronous. While a virtual class starts live as synchronous learning, it can be 'recorded' and 'played back' at any time even by learners who were not 'present' at the original event. The educator and the learners who participated in the original class become the authors of an asynchronous learning event that can be viewed by other learners at a time and place of their choosing (Morrison, 2003:7). However, the question is if developing countries l ke South Africa are ready for this ICT challenge.

4. INFORMATION TECHNOLOGY AND DEVELOPING COUNTRIES

To allow ICT to be used effectively as a learning tool, Internet connections and communication facilities are needed. Table 1 compares the communication profiles of developed and developing countries in 2000.   It shows the number of Internet hosts per 1 000 people as 48 for developed or high income countries, 0.3 for developing countries and 3.3 per 1 000 for South Africa at that time.

Comparing the communications profile of the developing countries and developed countries, it seems that least developed and developing countries will not have the traditional media in the coming years. 905 out of 1000 persons do not have television in developing countries. Main telephone lines per 1000 are 4 for least developed countries, 58 for developing countries, but 569 for industrial or high income countries.

Table 1: Communication profile

Items per 1 000	Least developed Countries	Developing countries	High income Countries	RSA	Zim-babwe	Nam-ibia	Bots-wana
Televisions	16	95	577	125	29	32	27
Public phones	-	1,3	5,1	3,5	0,2	1,3	1,3
Main telephone lines	4	58	569	115	17	69	56
Cellular phones	1	18	266	56	4	12	15
Internet hosts	-	0,26	48	3,3	0,08	1,6	0,42
Personal computers	-	-	315	47	9	19	25

Source: United Nations Human development report 2000.

The right to communicate is a base for the right to information. With this in mind, the following assumption is made: that the right to information in the least developed countries and developing countries is still far away. South Africa, on average, perform better on all the communication elements than the developing countries and its neighbours but is still far from its developed partners (Mulholland, 1997).

5. FACTORS INHIBITING AND ENHANCING EDUCATION VIA ICT IN SOUTHERN AFRICA

The following factors prevent ICT education from reaching its full potential in tertiary institutions (Hough, 2003:3):

- a lack of Internet expertise at executive, departmental and academic staff level,

- a poss ble lack of willingness on the part of academics to manage ICT education,

- the lack of an infrastructure to support the receipt and registration of assignments via the Internet,

- the relatively small number of students with access to the Internet,

- the difficulty of controlling the quality of study material on the Internet,

- copyright on the Internet study material,

- maintenance of the Internet study material and solid electronic support from tertiary institutions.

Factors that will enhance the use of ICT in education (Hough, 2003:3):

- the decreasing cost of printing and mailing study material to students – study material will be made available electronically, and printing and mailing costs will be considerably reduced.

- As mentioned earlier, South Africa needs to stay globally competitive regarding education. This will encourage tertiary institutions to take the lead in terms of ICT education and to really explore the possibilities of these electronic delivery systems.

6. RECOMMENDATIONS

The following actions will enhance the optimal use of ICT in the learning experience:

- Commitment, encouragement and funding from top management to increase the willingness of staff to use ICT during facilitation sessions.

- Training programmes for staff members to optimally use ICT for learning experiences e.g. Web CT courses.

- Mini-conferences to provide an environment for teaching staff to share success stories and development opportunities.

- Improved infrastructure enabling educators to use as many and different forms of ICT during contact sessions as poss ble e.g. learners being able to serve the Web during facilitation sessions, video clips using Windows Media Player, submitting assignments and tests via the Internet.

- Increased learner access to computers and the Internet.

- Enabling learners to learn continuously by posting learners' guides, study material, case studies, articles, assignments and self-evaluation questions on Web CT.

- Implementation of policies controlling the quality of study material available on the Internet or Web CT.

- Prepare learners to use ICT during learning by recognizing that in many instances learners are being challenged psychologically to abandon a familiar process and its security to adopt an unknown and threatening process.

7. CRITICAL DISCUSSION

For learners at the CUT to be on the same par as learners at other tertiary educational facilities, there should be increased on-campus access to computers and the Internet (e.g. computer and Internet facilities available in all departments for learners' use). This improved infrastructure will allow educators not only to deliver their messages with more clarity (e.g. serving the Web) while facilitating but will also allow more CUT-learners to submit assignments and assessments electronically. Thus, allowing the CUT to save money regarding photocopies.

8. CONCLUSION

E-learning offers a new opportunity to widen learner access to higher education, enabling learners to take control over their learning environment and providing an enhanced learning experience through greater interaction between educator and learner and learner with learner.

South African tertiary institutions need to take the 'giraffe approach' regarding e-learning. They need to tower above the trees to ensure that their learners are afforded the opportunity to be part of the new and exiting electronic learning world.

9. BIBLIOGRAPHY

Allen, IE & Seaman, J.
2004. Entering the mainstream: the quality and extent of on-line education in the United States, 2003 and 2004. The Sloan Consortium

Collis, B.
1996. Tele-learning in a digital world. The future of distance learning. URL:http://-inet.open.ac.uk/staff/collisr/global/edu.html

Hough, J.
2003. Information technology and the importance of synchronous and asynchronous strategies to enhance electronic learning. Paper presented at the 4th annual ICTE conference, Greece 2003.

Huang, C.
2004. Virtual Labs: E-learning for tomorrow. PLoS Biology, 2(6), 734-5.

Lewis, C.
2002. Driving factors for e-learning: an organizational perspective. Perspectives, 6(2), 50-55.

Morrison, D.
2003. E-learning strategies – how to get implementation and delivery right first time. Wiley: London.

Mulholland, S.
1997. Cyber education could fuel Mbeki's African renaissance. Business Times, Sunday Times, 6 July, p 1.

Robin, M.
1996. The globalization of education. URL:http://www-inet.open.ac.uk/staff/robinm/GlobalEdu.html.

Van Dam, N.
2004. The e-Learning Fieldbook – implementation lessons and case studies from companies that are making e-learning work. McGraw-Hill: New York.