PEDAGOGICAL SYNTHESIS AND EFFECTIVENESS OF INSTRUCTIONAL TECHNOLOGIES IN THE DELIVERY OPEN AND DISTANCE LEARNING PROGRAMME

Ojokheta, K. O.
Senior Lecturer, Department of Adult Education
University of Ibadan, Nigeria
E-mail: kojokheta@yahoo.com
Tel No; +2348062746167

Abstract
This paper describes vividly the various forms of instructional technologies as well as the generation of communication technologies available for the delivery of distance education programmes. This is premised on the belief that policy planners and practitioners in distance education need to possess in-depth knowledge of these technologies so as to guide them on the choice of the most appropriate technology to adopt in the delivery of distance education programmes. The paper also discusses the pedagogical effectiveness of each technology in relation to these programmes. This is also premised on the belief that the more familiar tutors are with instructional technologies, the more effective their will be. This was concluded with the criteria that distance education practitioners and managers can adopt or rely upon in the choice of the most appropriate technology in the delivery of distance education programmes with particular reference to Nigeria.
Keywords: *Pedagogical Synthesis, Effectiveness, Instructional Technologies, distance Education Programmes.*

Introduction

The emergence of open and distance learning as a distinct, unique, alternative, and standard component of educational delivery was enormously facilitated by different forms of interactive and non-interactive or electronic and non-electronic technologies. In fact, almost all the definitions of open and distance, from the old paradigm to the contemporary paradigm, emphasise the use of technology in mediating the teaching and learning process. In the old paradigm, the technology predominantly used to facilitate teaching and learning was postal correspondence by mail or sending of films and tapes by mail or by telephone communication between the tutors and the learners. Holmberg (1995) asserted that the "root of pure distance education or learning goes back, at least 160 years, to the beginning of correspondence study when an advertisement, in a 1833 Swedish Newspaper, touted the opportunity to study composition through the medium of the post.

In 1840, according to Holmberg, Isaac Pittman used England's newly established penny post to offer shorthand instruction through correspondence. Pittman later went on to establish the correspondence society, the precursor of the Isaac Pittman correspondence colleges. In the same period, Toussaint and Langenscheidt introduced correspondence from Berlin. In a similar vein, the correspondence study, with heavy reliance on print technological medium, was employed in Nigeria by the early educated elites such as: E.O. Ajayi, Alvan Ikoku, Samuel Ayodele Banjo, S.O. Adebo, A.T.O. Odunsi, A.Y. Eke, Kehinde Sofola, Olisa Chukwura, M.A. Adeyemo, N.K. Adamolekun and others to bag degree in various disciplines from universities abroad, especially University of London, due to the absence of a university in Nigeria then.

The above description of the roots of distance learning tremendously influenced the perceptions and the definitions of distance learning in line with print technology or correspondence study. This, to a greater extent, informed the reason why Delling, a distinguished distance educator of this period, defined distance education as a teaching process 'which is achieved by bridging the physical distance between student and teacher by means of at least one appropriate technical medium usually print.' Keegan (1986), Garrison and Shale (1987) defined distance education 'as a non-

contiguous communication between student and teacher mediated by print or some form of technology.'

However, due to the technological advances of the recent past, a great deal of excitement and hope has been generated for the use of sophisticated interactive communication technologies in distance education. Rapid advances in computer and telecommunications have made possible the development of learning modules that include elements such as: video transmission, e-mail, the internet, and the World Wide Web (WWW). These modules function either as components of the learning or as basis for instruction. The transformation or progression of distance education from pen-pals, college-correspondence courses, teleconferencing over speaker phones, teleconferencing via modern-transporting-still-pictures along with interactive audio, to the latest technologies of two-way, full video communication has created a paradigm shift in the perception and definition of distance education. For example, the United States Department of Education's Office of Educational Research and Improvement defined distance education as 'the application of telecommunications and electronic devices which enable students and learners to receive instruction that originates from some distant location' (Pea, 1994). Also, Calvert (2006) submitted that 'open and distance learning (ODL) is now considered nowadays as the most viable means for broadening access while improving the quality of education, advocating peer-to-peer collaboration, and giving the learner a greater sense of autonomy and responsibility for learning.

Similarly, Ameritech (1996) contended that 'as resources shrink and learning requirements expand, many educational institutions are relying on communication technologies, such as distance learning to enhance the effectiveness and efficiency of education. Morrison (1996) also asserted that telecommunications, software, and internet have eliminated walls and boundaries in distance education. He stated that 'an increasing number of students want and need non-traditional, flexible schedules. Distance education is becoming a common practice as evidenced by the number of universities that offer distance education programs, the number of businesses offering distance education and training programs, and the number of distance learning projects that are being created or are currently in use worldwide. In the New Directions in Distance Learning (NDDL) projects complied by Porter

(1994), he emphasised that the key element of distance education 'is the enhancement of independent learning materials through the use of interactive communications technologies and teacher mediation.

Based on the importance of the use of technologies in the delivery of distance education programmes, it is, therefore, imperative for major stakeholders in distance education to possess in-depth knowledge of these technologies so as to guide them on the choice of the most appropriate technology, as well as the pedagogical effectiveness of each technology in the delivery of distance education programmes. This is because the more familiar teachers are with the instructional technologies in distance education, the more effective their presentations will be.

This paper, therefore, explores and gives a detailed synthesis of available instructional technologies in distance education, the pedagogical effectiveness of each technology, and the criteria for choosing instructional technologies in distance education.

Generation of Communication Technologies in Distance Education

Distance education has gone through many stages of technological development. Garrison (1993), Garrison and Anderson (2000) contended that the methods of delivery in distance education have led to the conception of the term-generation of communication technologies in distance education with due consideration to their historical antecedents. The concept was first identified and was fully developed in 1999 by Garrison. Garrison and Peters (1998) argued that the concept has brought to light the two common features of distance education: the high degree of accessibility and the quality of interactive learning and teaching process. In line with this submission, Taylor (1999) has proposed five generations of distance education:

- Correspondence education;
- Integrated use of multiple one way media as print, broadcasting, or recorded media such as video cassettes;
- Two way synchronous tele-learning using audio or video conferencing;
- Flexible learning based on asynchronous online learning combined with online interactive multimedia;

- Intelligent flexible learning which adds a high degree of automation and student control to asynchronous online learning and interactive multimedia.

The First Generation

The progression through these stages of development has been driven mainly by changes in technology and educational theory. The first generation is characterized by the predominant use of a single technology and lack of direct student interaction with the teacher originating the instruction. Correspondence education is a typical form of first generation distance education, although educational broadcasting is another version. Correspondence education makes heavy use of standard textbooks, and the use of a contracted correspondence tutor, who is not the originator of the learning material, and often works for a commercial company. Students however take examinations from accredited institutions.

Second generation

Distance education is characterized by a deliberately integrated multiple-media approach, with learning materials specifically designed for study at a distance, but with two-way communication still mediated by a third person (a tutor, rather than the originator of the teaching material). Autonomous distance teaching universities, such as the British Open University, are examples of second generation distance education. Second generation distance education is based on specially designed correspondence texts, combined with standard textbooks and collections of readings from academic journals, and supported by television and/or radio programming. Open universities and distance education units in dual-mode institutions (institutions that are campus-based but also offer some of their programmes at a distance) have been associated more with systems-based and behaviourist or cognitive-science approaches to learning. These may be considered more teacher-focused and 'industrialized', in that all students get the same material, resulting in considerable economies of scale.

Taylor's **third generation** (two-way, synchronous tele-learning using audio or video-conferencing) is based on replicating as far as possible the classroom model through the use of synchronous interactive technologies such as video-conferencing, and relies heavily on lecturing and questions. This model of distance

education is often used by multi-campus institutions, because it saves travel time between campuses for instructors. However, it provides relatively small economies of scale, little flexibility for learners, because they still have to attend a campus at a set time, and the average cost per student tends to be high. Nevertheless, synchronous teleconferencing is popular because instructors do not have to change or adapt their classroom teaching methods to any extent.

Taylor's **fourth generation** is flexible learning based on asynchronous communication through the Internet and the World Wide Web (online learning). This model enables increased student-teacher and student-student interaction at a distance, collaborative group work, flexibility for learners to study anywhere at any time, and economies of scope, in that courses for relatively small numbers can be developed without high start-up costs. However, to exploit the educational advantages and to control costs, the design and delivery of asynchronous teaching must be different from both traditional approaches to classroom teaching and the large-scale design of Open University Programmes. Kaufman (1989) characterizes this as a progressive increase in learner control, opportunities for dialogue, and emphasis on thinking skills rather than mere comprehension.

Taylor's **fifth generation** is still experimental, based on a heavy automation of learning, and applies mainly to his own institution (University of Southern Queensland). A more plausible **fifth generation** is distance education based on the use of Web 2.0 tools that allow learners to control access to learning through social software, virtual worlds and multimedia tools such as YouTube.
Although these are useful classifications of the technological and educational development of distance education, the situation on the ground at any one time is much more complex.

Pedagogical Synthesis and Effectiveness of Technological Media for the Delivery of Distance Education Programmes

In specific terms, Nettleton (1991) summarised the technological methods or media used for the delivery of distance education as follows: print, radio, broadcast television, non-broadcast, audio-visuals, face-to-face tutorials and students support services, and advanced technology including computers and telecommunications.

A detailed description of these technological methods and media is presented below:

Print

While it is apparent that a large number of technological media or methods could be used for the delivery of distance education, however, in practice, print remains to be the basis of a large majority of distance education programmes. Courseware leaflets, textbooks, written assignments, and tests provide the foundation for learning in almost all cases in distance education. This was asserted by Rowntree (1992) and Moore and Kearsley (1996) when they opined that print is the most common form of instructional delivery in distance education institutions. This assertion was further stressed by Bates (1993) when he submitted that "in spite of the more influential institutions that made use of other media, such as the television and audio at the end of 1980's, the vast majority of distance education institutions throughout the world was still primarily print based...

Confirming these assertions, Perry (1984) surveyed distance education institutions across many continents and discovered that distance education institutions in Africa made 100% use of correspondence and print materials in their programmes while Asia and Latin America made use of 93% and 72% respectively. Perhaps, the predominant reliance and use of the print technology can be traced to its relative cheapness, inexpensive to develop, and easy distribution through the public mail or private delivery services (Moore and Kearsley, 1996). Adekanmbi, (2004) also posited that the continued use of print in Africa and many other developing countries has been due to its cheapness and easy accessibility. Peters (1998) equally submitted that print permit great economics of scale through industrialised methods of producing standard course packages which permits individualisation of learning. Adekanmbi (2004) further explained that despite the challenges of print, "there is still consistent romance with it and the transformation, in its context, is now improved in terms of better prepared texts, high quality course material developmental process, and improved desktop development practices. UNESCO (2003) also asserted that: "printed materials continue to be the mainstay of distance learning provision even for programmes like the United Kingdom Open University's (UKOU)... which has a major information

and communication technology element. Print plays multiple roles either as a lead or supporting medium and suitable to combine with variety of other media.

Print mode of delivery has also been found to assist in the democratisation of education, which the Open Polytechnic of New Zealand (2003) described as "education being made available, regardless of the constraints of time and place, to many adult learners who could not afford the time or expense of studying full-time, to many classes or those who could not have access to other technologies or technological support services to support their learning". Similarly, print is very effective for conveying abstract ideas and for serving as reference sources.

However, despite the so many advantages of print technology, its limitations include:

- Its passiveness as mode of delivery;
- Its non-effectiveness in the teaching of psychomotor skills or laboratory skills in science courses or oral /comprehensive skills in language course; and
- The problem of distribution which becomes more complex and more expensive, as the size of a distance education programme increases.

Radio Broadcasting

Radio is often assigned the second lace behind print as a delivery medium for distance education due to its general low cost and wide availability. Radio is most often used as a supplement, in conjunction, with other instructional delivery modes. In the same Perry's (1984) survey, it was found that there was heavy reliance on radio in Africa where 75% of the institutions surveyed used radio while in Asia and Latin America, 36% and 24% of the institutions used radio respectively. Similarly, in Nigeria, the University of Ibadan has established a radio station called Diamond FM 101, which is being used to extend the university to the entire state and beyond.

The use of radio for distance education has certain advantages, such as:

- It provides access to learning to students who are removed by location or scheduling from conventional institution.

- It offers, to distance education, the opportunity for advertising the instruction, providing variety, enrichment, and motivation to students, and pacing student's progress through course work.
- It is cost effective than television.
- It allows students to follow printed material and listen to the broadcast simultaneously.

However, radio has major limitations as an instructional medium:

- It is a one-way information transfer.
- It is transient- in that the students cannot go back over something that they do not understand.
- It must be broadcast on a fixed schedule regardless of the students scheduling requirements.
- It limits educators to the number of hours of broadcast time that they can pay for.
- It is pedagogically considered as a hard teaching medium where skills, or difficult ideas and concepts, or systematic and comprehensive development of knowledge is required.

Broadcast Television

Though broadcast television is used in some distance education programmes in some large distance/open universities like the Asian open Universities and the Chinese Radio and Television University, its use as instructional medium is largely minimal in many continents of the world. For example, Perry's (1984) survey also showed that in Africa, 17% of institutions surveyed used television and video in Asia; 17% used television and 17% used video; while in Latin America, 10% used television and 14% used video.

In recent times, the use of broadcast media for distance education appears to be decreasing as a result of the problems of cost, dependence on a separate broadcasting organisation for production and transmission, which is the major source of friction and misunderstanding as each agency has differing objectives for cost control, educational content, broadcast quality, and difficulty of producing and designing simpler programmes (Nettleton, 1991). Camber (1991) captured the problem of television technology in distance education in this way:

From the late 1950's and early 1960's television production

Technology was largely confined to studios and live broadcasts,

in which master teachers conducted widely broadcast classes.

Unfortunately, teachers who were experts in the subject matter were not necessarily the best and most captivating television talent, nor was the dull 'talking head' medium the best production method for holding the interest of the learners.

However, television images can clarify hard-to-observe processes, show practical skills, reinforce learning through visual cues, and affect opinions and beliefs with powerful images.

Non-Broadcast Audio and Visual Aids

In recent times, the use of non-broadcast audio-visual media appears to be on the increase, particularly audio cassettes which have proven to be extremely popular as well as cost-effective. Perry's survey found that 42% of African distance education institutions, 38% of Asian institutions, 70% of Australian institutions, and 24% of Latin American institutions made use of audio cassettes to complement teaching and learning in distance education. In another study, Bates, (1996, 2005) pointed out that audio cassettes and video cassettes have radically affected the ratio between fixed and variable costs for audio and video learning. This shows that distance education institutions with relatively small enrolments, under 1000, should be able to take advantage of audio-visual teaching methods since cassettes represent lower fixed costs relative to variable costs than broadcast methods or media.

The educational advantages of audio and video cassettes are numerous when compared to broadcast media. First, the learner or group can stop the tape whenever necessary to allow discussion, responses or repetition of the learning material as against the passive nature of most learning through television and radio broadcasts. Second, learners can use cassettes at a time of the day that is most convenient to their study. This contributes to increases in access since students with different schedules can still follow the materials. Bates (1993) found out, in a study conducted at the United Kingdom Open University that students ranked audio cassettes as the most useful component of their course work next to test. Since the cost of audio cassettes player is relatively inexpensive, distance education institutions, in developing

countries, should be able to take particular advantage of this technology to complement teaching and learning.

Computers and Telecommunications

Computers and other sophisticated interactive communications technologies, like electronic mail (e-mail), bulletin board systems (BBSs), the internet, telephone-based audioconferencing, and videoconferencing with 1 or 2-way video and 2-way audio via broadcast, cable, telephone, fiber optics, satellite, microwave, and closed-circuit or low power television, are huge opportunities for distance education. The internet and e-mail are particularly much useful for exchange of information between the learners and the tutors for counselling, tutoring, provision of up-to-date references, as well as for controlling and evaluating the work of the learner. Similarly, the use of these sophisticated technologies can affect distance education by increasing the reach of distribution of the electronic signal (telephone calls, computerised information, radio or television signals) that the educational system wishes to transmit to its users. However, the current use of these technologies for educational purposes, in most developing countries, is extremely low due to the extremely high costs of procurement and the technical complexities involved. In essence, these technologies should be more realistically applied to problems of administration rather than to the learning process for distance education in developing countries. Some scholars, Schamber (1988) and Barron & Orwig (1993) had recommended that for Africa, computers and telecommunications might best be considered from the standpoint of management for distance education programmes, for monitoring and evaluation, and for text production.

ICT and Instructional Delivery at Higher Educational Level: The Relevance of Distance Education System

The mode of instructional delivery in this contemporary age, and probably in the future, is likely to be influenced by telecommunication systems combined with network computer. This is because, according to Moore and Kearsley, (1996), "the telecommunication media have become very convenient and cost effective ways to facilate teaching and learning". In fact, in the developed world, teaching and learning are now increasingly

conducted through teleconferencing, audio conferencing, audio graphics, two-way video conferencing, computer conferencing, computer-based instruction, as well as electronic learning.

Taylor's (2001) separation of these technologies in teaching and learning based on the delivery over the internet and the promises to combine the advantages of good quality CD-ROM-based interactive media have facilitated the promotion of automated response systems and intelligent database in the developed countries. Similarly, the learning circuit organisation (2006) submitted that electronic learning covers a wide set of applications and processes, such as: web-based learning and virtual learning which are becoming more irresistible and popular among learners on a daily basis. Taylor (2002) prediction that electronic learning will reduce the cost of education to the learners and also encourage economics of scale which can lead to increase in access to education and other training activities worldwide is fast becoming a reality.

Therefore, the use of these technologies in the teaching and learning process, especially at higher educational level, can be seen as inevitable. Though some of these technologies are too complex and sophisticated for adoption in developing countries, Nigeria inclusive, because of the low level of technological development. Nevertheless, the impact of these technologies on teaching and learning cannot be underestimated. More of teaching and learning in the contemporary age are now being conducted through electronic mails which is a form of electronic learning.

The implication of this is that, the application of these technologies is much more promoted in distance education system than in conventional system. In fact, Garrison and Anderson, (2000) viewed distance education as a succession of generations of technologies. The analysis is that since the generations of technologies and distance education are closely linked, we cannot therefore underestimate the impact of these technologies on teaching and learning process, especially at the higher educational level. Hence, the use of these technologies is likely to be much more promoted through distance education system than conventional education system. Thus, the future of teaching and learning, at higher educational level, lies with these technologies and distance education.

Criteria for Choice of Instructional Technology in Distance Education

Distance education practitioners and mangers must take into due considerations some criteria before they decide the choice of technology to adopt in the teaching and learning process in distance education. The following are recommended:

- **Pedagogical Effectiveness of Different Technologies:** Practitioners and managers of open and distance education must compare the effectiveness of different technologies in the delivery of similar content to similar audience. This must be based on the analysis of the content of learning module, the goals of the learners and the tutors, as well as that of the institution, the learning profiles of the learners, the student model to be adopted, the institutional model to be designed, the technical capability of implementing the technology(ies), the factors which influence successful delivery, among others.
- **Cost of Procurement:** Management must honestly ask the question: does the institution possess the financial capability of procuring the sophisticated technology? If the answer is not, then management should settle for the less sophisticated technologies like the print and non-broadcast audio-visuals. Even though, the rapid expansion of information technology combined with economic forces is forcing institutions to investigate more (supposedly) cost-effective methods to deliver their courses (Gladieux, 2000), there is considerable pressure on educators to use modern technology to provide more flexible ways of delivering high quality educational programs (McNamara and Strain, 1997). This push to use technology has caused difficulties, not the least of which have been a failure to maintain a quality product (Vidovich and Porter, 1999), and the extra stress on the students brought about by a new and different form of communication (Hara, 2000). In his review of distance education, Dhanarajan (2001) pointed out the necessity to adapt the current teaching pedagogy to better exploit the technology.
- **Flexibility:** Tutors have to be allowed to choose, willing to make choices and qualified to implement their choices effectively. Just as there is no one best use of technology,

there is no one best way of teaching with technology. Flexibility must be encouraged; tutors must be allowed to develop their personal teaching approach by utilising the variety of options offered by a technology.

- **Accessibility, Availability, and Affordability of the Technology to the Students:** The reach of the technologies to the learners must be taken into due consideration. Will the learners have easy access to the technologies? Are they available to them, and can they afford to purchase them? It will be highly irresponsible and insensitive for a distance learning institution to choose and adopt a technology which is not accessible, available, and affordable to the learners. Technology meant for pedagogical instruction must be based on a learner-centred approach where the educational process is supported by the technology rather than being driven by it (Rumble, 2001; Petrides, 2002). Laurillard (2002) pointed out that it is a mistake to base the design of learning materials on the capabilities of the instructional media, and that good design must take into account the students' present state of understanding and the already established methods they use to acquire that understanding.
- **Technical Capability:** Where the technical know-how, in terms of operating a technology, would involve a high cost ot training and re-training of the personnel, there would be no justification, whatsoever, for the choice of such technology.
- **Level of Technological Development of a Country:** If the level of technological development of a country is low, there is no need for a distance learning institution to even think, not to talk of choosing any of the sophisticated interactive communication technologies. However, because of the increasing popularity of internet and electronic mails, distance institutions can adopt these technologies but not as the major technology of teaching and learning. At most, they can complement with the adoption of the less sophisticated technologies like the print and non-broadcast audio-visuals.
- **The Enrolment Rate:** The enrolment rate of learners into a distance education programme should strongly determine the choice of technology to be adopted for pedagogical instruction. If the enrolment rate is minimal (less then

1000), the print and the non-broadcast audio-visuals technologies will be more appropriate to choose. However, if the enrolment is relatively higher (5000), the choice of broadcast media like the radio and television can be accorded a consideration. If the enrolment rate is significantly higher (20,000+), then the choice of one or two of the sophisticated technologies like the internet and the electronic mail can be considered.

- **Rewarding a Task:** A widely accepted technology is most often defined by a single characteristic: if it makes a task rewarding for the user - the students and the faculty. According to Holloway and Ohler, (1991), "if a technology does not make the performance of a task rewarding, there is little motivation to accept the technology. Conversely, if it simplifies or expedites the accomplishment of a goal, the probability of its acceptance is high".

The criteria, discussed above, are by no means exhaustive. However, they remain some of the most important criteria that should be given thorough consideration in the choice of technologies for pedagogical instructional dissemination in distance education programmes.

Conclusion

The application of technologies in distance education is inevitable. Therefore, as technologies continue to advance, so also will distance education continues to expand. Hence, the choice of technology in the successful delivery of distance education programmes remains highly crucial. This is why all major stakeholders in distance education must be equipped with the knowledge of the pedagogical effectiveness of all the technologies available in distance education.

References

Adekanmbi, G. (2004). *The Transformation of Distance Education in Africa.* Available online http//www.col.org/forum/PCF paper.

Afolabi-Ojo, G.J. (1986). *Towards Distance Learning Systems in Nigeria.* A Valedictory Lecture Delivered at Obafemi Awolowo University, Ile-Ife, Nigeria.

Ameritech, (1996). *Ameritech Distance Learning.* Available online http://horizon.voc.edu/projects/issues/papers/distance learning.aspret.

Barron, A, and Orwig, G. (1993). *New Technologies for Education.* Englewood, CO: Libraries Unlimited.

Bates, A. (1993). *Theory and Practice in the Use of Technology in Distance Education.* In D. Keegan (Ed.) **Theoretical Principles of Distance Education.** London: Routledge.

Bates, A. (1999). *Restructuring the University for Technological Change*. In J. Brennan; J. Fedrowitz; M. Huber; and T. Shah, **What Kind of University? International Perspectives on Knowledge Participation and Governance.** Buckingham: Oxford University Press.

Bates, A.W. (2005). *Technology, E-learning and Distance Education.* London/New York: RoutledgeFalmer.

Calvert, J. (2006). *Achieving Development Goals-Foundations in Open and Distance Learning: Lessons and Issues.* Available Online. http://pat4.dec.uwi.edu/overview.php. Retrieved June, 6 2006.

Cambre, M.A. (1991). *The State of the Art of Instructional Television*. In G.J. Anglin (Ed.), **Instructional Technology: Past, Present, and Future.** Englewood, CO: Libraries Unlimited.

Dhanarajan, G. (2001). *Distance education: promise, performance and potential.* ***Open Learning,*** **16**, 61-68.

Garrison D.R., Anderson, T. and Archer W. (2001). *Critical Thinking, Cognitive Presence, and Computer Conferencing in Distance Education.* ***American Journal of Distance Education,*** **15**, 7-23.

Garrison, D. and Anderson, T. (2000). *Transforming and enhancing university teaching: stronger and weaker technology influence.* In T. Evans and D. Nation (Eds.), **Changing University Teaching: Reflections on Creating Educational Technology.** London: Kogan Page.

Garrison, D. (1993). *Multifunction microcomputer enhanced audio-conferencing: Moving into the third generation of distance education.* In K. Harry, M. John and D. Keegan (Eds.), **Distance Education: New Perspective.** London: Routledge.

Garrison, D.R. and Shale, D. (1987). *Mapping the boundaries of distance education: Problems in defining the field.* **The American Journal of Distance Education.** 1 (1), 7-13.

Gladieux, L. (2000). Global On-line Learning: Hope or Hype? *Higher Education in Europe,* **25**, 351-353.

Hara, N. (2000). *Student distress in a web-based distance education course.* **Information,**
Communication and Society, 3, 557-579.

Holloway, R.E. and Ohler, J. (1991). *Distance Education in the Next Decade.* In G.J. Anglin (Ed.), **Instructional Technology: Past, Present, and Future.** Englewood, CO: Libraries Unlimited.

Holmberg, R. (1995). *Theory and Practice of Distance Education.* London: Routledge.
http://www.bankingoustraliasfuture.gov.au/submissions/issues.

Keegan, D. (1986). *The Foundations of Distance Education.* London: Croom Helm.

Laurillard, D. (2002). *Rethinking University Teaching: A Framework for the Effective Use of Learning Technologies*, Routledge Falmer, London.

Learning Circuits (2007). Glossary. Available Online.
url:http://www.learningcircuits.org/glossary.

Lyall, R. and McNamara S. (2000a). *Learning Tool or Pot Plant Stand? Students' Opinions of Learning from a CAL Program.* **Australian Journal of Educational Technology**, **16**, 126-146.

Lyall, R. and McNamara S. (2000b), *Influences on the Orientations to Learning of Distance Education Students in Australia.* **Open Learning, 15**, 107-121.

Moore, M. & Kearsley, G. (1996). *Distance Education: A Systems View.* Belmont: Wads Worth.

Morrison, J. (1996). *Paradigm Shifts: On the Horizon.* Horizon List Archives,
http://horizon.unc.ed/projects/issues/papers/distance learning.asp.retrieved 9/25/2002.

Nettleton, G.S. (1991). *Uses and Costs of Educational Technology for Distance Education in Developing Countries: A Review of Recent Literature.* In J. Lockheed (Ed.), **Educational Technology: Sustainable and Effective Use.** Washington D.C.: World Bank.

Pea, R.A. (1994). *Seeing what we build together: Distributed multimedia learning environments for transformative communications.* **Journal of the Learning Sciences,** 3(3), 285-299.

Perry, S. (1984). Quoted in Nekatibeb, T. (2001a). *The Implementation of Daily English Radio Instruction Programs in Ethiopia: A Formative Evaluation Report.* Addis Ababa: BESO/USAID.

Peters, O. (1998). *Learning and teaching in Distance Education and Teaching in Distance Education.* United Kingdom: Kogan Page.

Petrides, L. (2002). *Web-based technologies for distributed (or distance) learning: creating learning centered educational experiences in the higher education classroom* **International Journal of Instructional Media**, **29**, 69-77.

Porter, D. (1994). *New Directions in Distance Learning.* In D. Porter (Ed.) Interim Report. (Available: David Porter, Manager, Schools Curriculum Prtograms, 4355 Mathissi Place, Burnaby, B.C., Canada V5G458).

Rowntree, D. (1992). *Exploring Open and Distance Learning.* London: Kogan Page.

Rumble, G. (2001). *Reinventing distance education: 1971-2001.* **International Journal of Lifelong Education, 20,** 31-43.

Schamber, L. (1988). *Delivery Systems for Distance Education.* (ERIC Document Reproduction Service NO. ED 304 111).

Taylor, J. (2002). *Distance Education: The Fifth Generations.* Proceedings of the 19th ICDE World Conference on Open Learning and Distance Education, Vienna, Austria.

Vidovich, L. and Porter P. (1999). *Quality Policy in Australian Higher Education of the 1990s: Universities Perspectives.* **Journal of Educational Policy**, **14**, 567-586.