

# INFORMATION AND COMMUNICATION TECHNOLOGY AND BUSINESS EDUCATION IN NIGERIA

*Agbo Joel Christopher Onu, PhD*

Department of Business Administration, Faculty of Administration,  
Ahmadu Bello University, Zaria, Nigeria

---

## **Abstract**

Technological change and globalization have created a new global economy with Information and Communication Technology (ICT) occupying a complex position in relation to globalization. The emergence of this new global economy has serious implications on the nature and purpose of educational institutions. The paper is basically a theoretical discourse. Data for analysis were obtained from secondary sources. The paper found that significant challenges confront the integration of ICTs in education in the areas of educational policy and planning, infrastructure, language and content, capacity building and financing in Nigeria. The paper concluded that business education needs to be well equipped to anticipate and respond to opportunities created by ICTs in order to participate productively and equitably in an increasingly technology-rich and knowledge-driven world. The paper recommended, among others, that the investments in ICTs should be used to promote the development of basic skills, problem-solving and communication skills and the professional development of teachers.

---

**Keywords:** Information, Communication, Technology, Business, Education

## 1.0 Introduction

Globalization and technological change have created a new global economy “powered by technology, fuelled by information and driven by knowledge (Tinio, 2002). Gaible (2009) affirms that ICT occupies a complex position in relation to globalization. The emergence of this new global economy has serious implications on the nature and purpose of educational institutions. Thornburg (2000) notes that as the half-life of information continues to shrink and access to information continues to grow exponentially, schools cannot remain mere venues for the transmission of a prescribed set of information from teacher to student over a fixed period of time. Rather, schools must promote “learning to learn” – the acquisition of knowledge and skills that make possible continuous learning over the lifetime. Thus, the illiterate of the 21<sup>st</sup> century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn (Tinio, 2002).

Information and communication technologies (ICTs) are potentially powerful enabling tools for educational change and reform processes through improving both access to education and the quality of that education. ICTs help expand access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality by helping make teaching and learning into an engaging, active process connected to real life when used appropriately.

The explosion of the Internet in the 1990s, the emergence of a variety of low-cost computing devices and increased diffusion of computers throughout society ushered in a wave of “ICT and education” policies and projects in developing economies around the world designed to prepare students to effectively engage in the information age. This requires focusing on the technology itself and placing emphasis on the practical implications of the use of ICTs to meet broad educational objectives. Educational programs, therefore, should take a holistic approach to ICT and link the educational goal of expanded ICT use to necessary associated reforms of the curriculum, student assessment system, instructive approaches in the classroom and teacher training.

ICT has become one of the basic building blocks of modern society. ICTs in education deal with the use of ICTs within educational technology. Many countries, according to UNESCO (2002), now regard understanding ICT and mastering the basic skills and concepts

of ICT as part of the core of education, alongside reading, writing and numeracy. This is critical to business education in Nigeria.

Business education is the field of training in business practices and in specific skills such as accounting, information processing, keyboarding/typewriting and shorthand. This paper uses business education and education interchangeably.

The objective of this paper is to assess the implications of integrating ICTs in business education in Nigeria. It determines also the appropriate and effective use of ICTs in the educational system in Nigeria. The paper is basically a theoretical discourse. Data for this paper were obtained mainly from secondary sources which included books, journals, seminar papers and the Internet.

### **1.1 Statement of the Problem**

The new global economy created by technological change and globalization with ICTs at the core has serious implications on the nature and purpose of educational institutions. ICTs are potentially powerful enabling tools for educational change and reform processes. The extent to which this has helped improved both access to education and the quality of that education in Nigeria requires determination.

The educational effectiveness of ICTs depends on their use and purpose. Haddad and Drexter (2002) identified a number of levels of technology use in education and how they can address varying business education challenges. But how have these been employed in expanding access to, and raising quality education in Nigeria? The optimal level of ICT integration in the educational system also needs to be ascertained.

### **2.0 Literature review**

Blurton (2002) defines ICTs as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. These technologies include computers, the Internet, broadcasting technologies (radio and television) and telephony. ICTs in education deal with the use of Information and Communication Technologies (ICTs) within educational technology. This includes e-learning, blended-learning and open and distance learning.

e-learning, according to Tinio (2002), encompasses learning at all levels, both formal and informal, that uses an information network – the Internet, an intranet (LAN) or extranet (WAN) – whether wholly or in part, for course delivery, interaction and/or facilitation. It is also referred to as online learning. Web-based learning is a sub-set of e-learning. It refers to learning using an Internet browser (such as Netscape or Internet Explorer). Tinio (2002) defines blended learning as learning models that combine traditional classroom practice with e-learning solutions. It considers the subject matter, the learning objectives and outcomes, the characteristics of the learners and the learning context in order to arrive at the optimum mix of instructional and delivery models. For instance, students in a traditional class can be assigned both print-based and online materials; have online mentoring sessions with their teacher through chat and are subscribed to a class e-mail list. Or a Web-based training course can be enhanced by periodic face-to-face instruction.

Open and distance learning is a way of providing learning opportunities that is characterized by the separation of teacher and learner in time or place, or both time and place; learning that is certified in some way by an institution or agency; the use of a variety of media, including print and electronic; two-way communications that allow learners and tutors to interact; the possibility of occasional face-to-face meetings; and a specialized division of labor in the production and delivery of courses (the Commonwealth of Learning, 2002).

ICTs are relevant in business education to meet the challenges at the core of teaching and learning process; and challenges to the system such as monitoring teacher attendance, transfer and payment of salaries and the mapping of student populations and the educational resources meant to serve them.

ICTs have the potential for increasing access to and improving the relevance and quality of education in developing countries. World Bank (1998) reports:

*[ICTs] greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution, and widen the range of opportunities for business and the poor. One of the greatest hardships endured by the poor, and by many others who live in the poorest countries, is their sense of isolation. The new communications technologies promise to reduce that sense of isolation, and to open access to knowledge in ways unimaginable not long ago.*

ICTs are potentially powerful tools for extending educational opportunities, both formal and informal, to those previously underserved in rural areas, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

ICTs have the ability to transcend time and space. They make possible *asynchronous learning* or learning characterized by a time lag between the delivery of instruction and its reception by learners. ICT-based educational delivery also dispenses with the need for all learners and the instructor to be in one physical location. In addition, ICTs such as teleconferencing technologies enable *synchronous learning*. Instruction can be received by multiple, geographically dispersed learners simultaneously.

Expanded education is also enhanced through access to remote learning resources. With the Internet and the World Wide Web, a wealth of learning materials can be accessed from anywhere at anytime of the day by unlimited number of people. Thus, teachers and students no longer have to rely solely on printed books and other materials in physical libraries which are limited in quantities for their educational needs. ICTs also facilitate access to resource persons all over the world.

ICTs have the capacity to prepare the present generation of students for a workplace where computers, the Internet and related technologies are becoming more and more ubiquitous. Technological literacy - the ability to use ICTs effectively and efficiently - is thus seen as representing a competitive edge in an increasingly globalizing job market. In addition to technological literacy, EnGauge in Tinio (2002) identified other job skills referred to as 21<sup>st</sup> Century Skills. These include digital age literacy (consisting of functional literacy, visual literacy, scientific literacy, technological literacy, information literacy, cultural literacy and global awareness), inventive thinking, higher order thinking and sound reasoning, effective communication, and high productivity. ICTs have the potential to promote the acquisition of these skills through using it as a tool for raising educational quality. The acquisition of these skills will enhance the quality of business education in Nigeria.

Improving the quality of education and training is a critical issue considering the level of educational expansion in Nigeria. Haddad (2002) observes that ICTs enhance the quality of education by increasing learner motivation and engagement (through videos, television and

multimedia computer software that combine text, sound and colorful, moving images), facilitating the acquisition of basic skills (through drill and practice, e.g. Sesame Street) and enhancing teacher training (e.g. Web-based courses through the Internet, satellite-based one-way video- and two-way audio conferencing by telephone, e-mail and fax).

While some groups feel that the introduction of ICTs in an education system offers the opportunity for students to learn by themselves, precluding the need for teachers, Gaible and Burns (2005) argue that there is no compelling evidence to support such approaches system-wide. Global experience highlights how vital teachers are in ensuring the effectiveness of educational technology outputs. Educational technology initiatives around the world demonstrate that the enabling environments are as effective as the teachers who are central to them.

ICT-supported education can promote the acquisition of the knowledge and skills that will empower students in Nigeria for lifelong learning. Computers and Internet technologies enable new ways of learning which include active learning, collaborative learning, creative learning, integrative learning and evaluative learning. ICTs allow a shift from a teacher-centred pedagogy and enable learners to explore and discover rather than merely listen and remember. Gaible (2009) reiterated this fact by stating that ICT ensures that students have adequate literacy, numeracy and other basic skills. ICT is also presented as enabling teachers and students to engage with learning in new ways, ways that transform their relationships to mathematical problems, history, culture and art, and to innovation and creativity.

The potentials for ICTs to help enable and further a variety of educational reform objectives in Nigeria remain undeniable. ICTs are important tools for educational reform and can be utilized as a knob for organizational change, as a vehicle to introduce new teaching and learning practices and/or as an enabler of restructuring of the educational system. ICTs can also help in anti-corruption efforts in the education sector. ICT has enabled learning through multiple intelligence as it has introduced learning using simulation games, which enables active learning through all senses (Anonymous, 2011). The purchase of computers, for example, provides a useful tangible symbol of a commitment to investment in change, and ICTs themselves can potentially provide important vehicles to help bring about desired reforms.

It must be noted that changes and innovations in technology come much faster than changes in the educational system, and the product cycle of most ICT-related products is much faster than the 'life cycles' of education change and reform. A lack of congruence between the timeliness for roll out of educational reform efforts and the roll out of supporting ICT tools (hardware, software and training) is a potential area of great challenge, as reforms may be dependent on technologies that are obsolete. Even where reform process is ongoing, the pace of technological innovation outruns the pace of institutional innovation. This disconnect is important.

Porta (2010) argues that ICTs can be used to extend access to educational delivery techniques, to support the ongoing professional development of teachers and to facilitate education-related data collection and processing efforts in ways previously not possible. ICT infrastructures can provide a fundamental building block upon which whole sets of knowledge and information service and activities can be enabled.

Emerging ICT tools offer new opportunities to develop some of the critical early literacy skills, the development of which is fundamental if the large numbers of low-literate learners (especially in rural areas) are to take advantage of the educational opportunities presented to them through expanding access to formal education. The need for ICT in and for education is now seen worldwide as both a necessity and opportunity. ICT permeates the business environment, it underpins the success of modern corporations and it provides governments with an efficient infrastructure. Equally, ICT adds value to the processes of learning and in the organization and management of learning institutions. The Internet is a driving force for much development and innovation in both developed and developing countries (Anonymous, 2011).

Technological developments lead to changes in work which has necessitated changes in the organization of work and required competencies. To benefit from technological developments, educational institutions must be able to educate a cadre of professionals with sound ICT backgrounds, independent of specific computer platforms or software environments.

### **3.0 Issues in the use of ICTs in education**

The potential of each technology varies according to how it is used. ICTs encompass so many different things and can be used in various ways to help address varying business education challenges in Nigeira. Haddad and Drexler (2002) identify at least five levels of technology use in education: presentation, demonstration, drill and practice, interaction and collaboration. Print, audio/video cassettes, radio TV broadcasts, computers or the Internet may be used for presentation and demonstration. Video technologies, drill and practice may also be performed using the whole range of technologies. However, networked computers and the Internet have the best potential of enabling interactive and collaborative learning. The overall impact of ICTs on education requires consideration in the areas of effectiveness, cost, equity and sustainability.

The educational effectiveness of ICTs depends on how they are used and for what purpose. ICT tools have been used in:

- i. Enhancing access to education. Though it is difficult to quantify the degree to which ICTs have helped expand access to basic education, the television-based project is an exception. In Asia and Africa, assessments of distance learning projects at the junior secondary level using a combination of print, taped and broadcast technologies have been less conclusive, while at the primary level, there is little evidence that ICT-based models have thrived (Perraton and Creed, 2002). In higher education and adult training, there is some evidence that educational opportunities are being opened to individuals and groups who are constrained from attending traditional universities.
- ii. Raising quality education. Evidence from the research on the impact of educational radio and television broadcasts on the quality of basic education suggests that these interventions are as effective as traditional classroom instruction (Hannafin and Savenye, 1993). Findings from the analysis of the Interactive Radio Instruction project provide strong evidence of the project's effectiveness in raising the quality of education (Perraton and Creed, 2002).

Assessments of the use of computers, the Internet and related technologies for distance learning have been unclear. Russel (1999) claims that there is “no significant difference” between the test scores of learning taking ICT-based distance learning courses and those receiving face-to-face instruction. However, Merisotis and Phipps (1999) assert that such generalizations are inconclusive, pointing out that the large number of articles on ICT-based



distance learning does not include original experimental research or case studies. Other critics argue that dropout rates are much higher when instruction is delivered at a distance via ICTs.

The use of computers, the Internet and related technologies, given adequate teacher training and support, can indeed facilitate the transformation of the learning environment into a learner-centred one. Since technology use is fully integrated into the larger learning system, it is very difficult to isolate technology variable and determine whether any observed gains are due to technology use or some other factor or combination of factors.

The other issue to consider in determining the impact of ICTs on business education is cost. Blurton (2002) opines that educational television broadcasts and computer-based and online learning are more expensive than radio broadcasts. It is, however, difficult to ascertain whether television broadcasts are cheaper than computer-based and online learning. Determining the cost-effectiveness is difficult because of lack of data, differences in programs, problems of generalization and problems of quantification of educational outcomes and opportunity costs. With respect to computers and the Internet, Blurton (2002:18) argues that “when considering whether ICT is “cost-effective” in educational settings, a definitive conclusion may not be possible for a variety of reasons. However, when considering the alternative of building more physical infrastructure, the cost savings to be realized from sharing resources and the societal price of not providing access, ICT as a means of enabling teaching and learning appears to be an attractive and necessary alternative.”

The cost of a particular ICT educational application can be categorized into fixed and variable costs. Fixed costs include retrofitting of physical facilities, hardware and networking, software, and upgrades and replacement. Variable or recurrent costs include professional development, connectivity (including Internet access and telephone time) and maintenance and support which include utilities and supplies.

Another dimension of cost is location or who will pay for what. In relation to computers connected to the Internet, either the school or student or both should bear the variable costs connected to operations such as maintenance, Internet service charges and other charges. In contrast, with radio programming, the learner has to pay only for a radio and a set of batteries or energy charges. However, in Nigeria where there is unstable power supply, the cost translates beyond energy charges. It includes the cost of acquiring and maintaining generator sets for use where and when there is no power supply.

Introducing ICTs raises important and serious equity issues. There is a serious concern that the use of ICTs in education will widen the existing divisions drawn along economic, social, cultural, geographic and gender lines given the disparities in access to ICTs between different groups in a country – even between developed and developing countries. This will further marginalize groups already excluded or marginalized from existing educational practice and environments.

Tendon (1998) asserts that the introduction of ICTs in education, when done without careful deliberation, can result in the further marginalization of those who are already underserved and/or disadvantaged. Women, for example, have less access to ICTs and fewer opportunities for ICT-related training compared to men because of illiteracy and lack of education, lack of time, lack of mobility and poverty. Mark in Tinio (2002) concludes that boys are more likely than girls to have access to computers in school and at home; and that boys tend to enjoy working with computers more than girls.

In an evaluation of its program in four African countries, Worldlinks found that despite efforts to make the program gender neutral, gender inequalities in access persist in Uganda and Ghana. Furthermore, while girls benefited more from the program in terms of improved academic performance and communication skills, boys were able to sharpen their technological skills more. According to Gadio (2001), a complex of economic, organizational and sociocultural factors account for these differences. He argues that high student-to-computer ratios and first come-first serve policies do not favor girls, girls have earlier curfew hours and domestic chore responsibilities which limit their access time, and local patriarchal beliefs tend to allow boys to dominate the computer lab environment. This is also applicable to Nigeria. He, however, proposed some measures to address this gender bias which include encouraging schools to develop “fair use” policies in computer labs, conducting gender sensitivity sessions, and advocating for reducing the after-school duties of girls to give them more time to use the computer lab. Haddad and Jurich (2002) attest to the need for girls to have female role models to inspire them to participate in technology related activities. Female role models in technology related activities in Nigeria are lacking.

In addition to providing access to ICTs to address equity issues, equal attention must be paid to ensuring that the technology is actually being used by the target learners in ways that truly serve their needs. ICT use holds real promise and opportunity for facilitating greater

inclusion of special needs students, learners in remote areas, students from historically marginalized linguistic, cultural ethnic groups and low income communities into existing educational practices and environments. ICT-enhanced educational programs require sustainability.

Sustainability of ICT-enhanced educational projects is one aspect of development programs that is often neglected. In many instances, international aid agencies or corporations which initiate these projects do not pay enough attention to establishing a mechanism by which the educational institution or community involved can pursue the project on its own or in partnership with other stakeholders after the initiating donor exits. Sustainability of ICT-enabled programs has four components: social, political, technological and economic.

- i. **Economic sustainability.** This refers to the ability of a school and community to finance an ICT-enabled program over a long term period. The need to develop multiple channels of financing through community participation ties economic sustainability closely to social and political sustainability.
- ii. **Social sustainability.** This is a function of community involvement. The success of an ICT-enabled project is connected to the acceptability of parents, political leaders, business leaders and other stakeholders. Innovation must consider those who will be affected directly or indirectly. They must know why such an innovation is introduced, the implications on their lives and the part they can play in ensuring its success. ICT-enabled programs must ultimately serve the needs of the community. Thus, to achieve sustainability, a sense of ownership of the project must be developed among all stakeholders.
- iii. **Political sustainability.** Refers to issues of policy and leadership. Resistance to change is one of the critical threats to ICT-enabled projects. Leaders must, therefore, have an intense understanding of the innovation process, identify the corresponding requirements for successful adoption and, accordingly, harmonize plans and actions.
- iv. **Technological sustainability.** Involves choosing technology that will be effective over the long term. The threat of technological obsolescence makes this a particularly critical issue for planners to contend with as the technological environment is rapidly changing. When making technology decisions on the most appropriate tools for achieving the desired educational goals, planners should not consider only costs but also the availability of spare parts and technical support.

#### **4.0 Challenges of the integrating ICTs educations**

Generally, ICTs empower teachers and learners, promote change and foster the development of 21<sup>st</sup> century skills. However, there is no one, singular strategy for determining the optimal level of ICT integration in the educational system. Significant challenges confronting the integration of ICTs in education are in the areas of educational policy and planning, infrastructure, language and content, capacity building and financing.

Educational reforms through ICTs require clear and specific objectives, guidelines and time-bound targets, the mobilization of required resources and political commitment at all levels to ensure the success of the initiative. The planning elements for ICT involve a thorough analysis of the present state of the educational system; the specification of educational goals at different education and training levels, as well as the different modalities of use of ICTs that can best be utilized in pursuit of these goals; the identification of stakeholders and the harmonizing of efforts across different interest groups; the piloting of the chosen ICT-based model; and the specification of existing sources of financing and the development of strategies for generating financial resources to support ICT use over the long run.

The national telecommunications and information infrastructure is the foundation for a country's educational technology infrastructure. Before launching an ICT-based program, consideration must be given to appropriate rooms or buildings available to house the technology, the availability of electricity and telephony; and the ubiquity of different types of ICT in the country in general and in the educational system in particular. To enhance computer-based or online learning, there must be access to computers in schools, communities and households, as well as affordable internet service. ICT use in education should follow use in society. It is cheaper and easier to introduce a form of technology into education and keep it working where education enjoys a large-scale development by governments or the private sector.

The success of ICT integration in education depends on the development of various competencies throughout the educational system. This hinges on the teacher professional

development, competency of educational administrators in using the technology, available and dedicated technical support specialists to ensure the continued viability of ICT; and content development units to adapt existing ICT-based educational materials for local use.

Language and content is a fundamental challenge confronting ICT integration in education. The dominant language of the Internet is English. Anzalone (2001) supports this claim by stating that 80% of online content is in English. A large proportion of the educational software produced in the world market is in English. In parts of the country or the world where English proficiency is not high, especially in rural areas, this represents a serious barrier to maximizing the educational benefits of the World Wide Web. It becomes necessary, therefore, that teaching and learning materials that match national curriculum requirements and have locally meaningful content, preferably in the major local languages, be developed. This would ensure multiculturalism and inclusion of isolated, rural population, cultural minorities and women in general in ICT-enhanced education programs.

Balancing educational goals and economic realities is one of the greatest challenges in ICT use in education. ICTs in education programs require large capital investments. Business educators need to be prudent in making decisions about the models of ICT use to be introduced. They should also be conscious of maintaining economies of scale. Decision must be made on whether ICT-based learning is the most effective strategy for achieving the desired educational goals. The modality and scale of implementation that can be supported given existing financial, human and other resources must be determined.

Indeed, the financing mechanisms utilized to fund the initial deployment of ICT hardware and software as part of various initiatives in the education sector or to sustain such investments over time, may not be available. To meet this challenge, McKinsey (2005) suggests creative solutions through public-private partnerships.

Paucity of data on the nature and extent of the issues and challenges associated with ICT in education initiatives to enhance adequate budgeting and financial appropriation is a challenge in the area of financing. Insufficient attention is paid to monitoring and evaluation issues and feedback loops during the program design process of most ICT in education initiatives. This is due largely to lack of monitoring and evaluation tools and methodologies dealing with the use of ICTs in schools and their impact on teaching and learning. Though ICTs empower teachers and learners, promote change and foster skills development, there are

limited data to support this. There is also limited data to help us understand the costs of such initiatives, especially those related to the total cost of operation over time. Moreover, the way such costs are calculated are often not very transparent. This fundamental disconnect remains a niggling challenge to ICT use in business education in Nigeria.

## **5.0 Conclusion and recommendations**

Though emerging ICT tools offer new opportunities in education through expanding access to formal and informal education, most countries (including Nigeria) face significant challenges in harnessing their educational systems to promote broader economic and social development plans. Nevertheless, governments are articulating broad visions of the development of “information societies” in which widespread access to technology can nurture human capital, improve government services, promote culture and support economic growth. The ICT sector is being targeted as a vehicle for this growth and social development; and business education has a crucial role to play in such efforts.

The challenge for educational systems moving forward, therefore, is to take advantage of the opportunities provided by ICTs to support learning outside of schools while, at the same time, incorporating ICT-related practices and models from daily life in wider society into formal educational structures and processes. Exploring and realizing the potential for ICTs help make schools more productive and efficient than they currently are, transform teaching and learning into an engaging and active process connected to real life, and prepare the current generation of young people for the future workplace may be a key determinant of the future success (or failure) of such initiatives.

Considering the myriad of challenges confronting ICT use in education, the paper recommends the following:

- 5.1 The approaches to the use of ICTs in education should be pursued holistically. The success or failure of most ICT/education initiative is based not only on sound implementation practices, but on the nature and quality of broader educational policies and strategies in which the use of ICTs is embedded. Technology is only a tool to enhance the quality of education. No technology can fix a bad educational philosophy or compensate for a bad practice. Considerations of the potential use of a variety of ICTs should flow out of concern for specific developmental challenges and not merely on a desire to introduce ICTs per se.

- 5.2 The investments in ICTs should not only be used to promote the development of basic ICT skills (such as keyboarding, competencies in operation and office productivity), but also to enable the development of broader set of critical thinking, problem-solving and communication skills.
- 5.3 Technology changes very quickly. Thus, utmost care should be taken in making big investments on a singular technology (or vendor). Over-reliance on a particularly promising technology solution today may inhibit an education system's ability to adapt as new technologies emerge in the future.
- 5.4 Special attention should be placed on the professional development of teachers. Teachers are at the heart of the educational process. The introduction of ICTs makes this position of the teacher more important. ICTs play valuable roles in upgrading the subject-specific competencies of teachers through increased access to quality education content, distance learning opportunities and self-placed tutorials. More fundamentally, it also helps in building formal and informal support networks at both the pre-service and in-service levels which enable teachers to explore the use of new tools and techniques to help engage with and support learners in new and productive ways.
- 5.5 The use of ICTs should be monitored and evaluated regularly and closely to meet a variety of educational objectives. Business educators should be prepared to change direction if required. Success requires meeting all the conditions of innovation and change to occur. This calls for stakeholder engagement, relating the innovation to the conventional, articulating the added value of ICTs, assessing and mitigating risks and planning for and implementing necessary change management processes.
- 5.6 Proactively ensure that teachers or business educators have necessary knowledge, skills and tools to respond to, and take advantage of, the challenges and opportunities that technological advances present to addressing key developmental challenges in the education sector.

Business education needs to be well equipped to anticipate and respond to challenges and opportunities ICTs present and represent, in helping education systems meet not only the Millennium Development Goals, but to participate productively and equitably in an increasingly technology-rich, knowledge-driven world.

**References:**

- Anonymous (2011). Information and communication technologies in education. (Online) Available: [http://in.wikipedia.org/wiki/information\\_and\\_communication\\_technology](http://in.wikipedia.org/wiki/information_and_communication_technology). Accessed: 26 August, 2011.
- Anzalons, S (2001). ICTs to Support Learning in Classrooms in SEAMEO Countries: At What Costs? Bangkok: Paper prepared for SEAMEO conf. March 26-29.
- Blurton, C. (2002). New Directions of ICT Use in Education. (Online) Available: <http://www.unesco.org/education/educprog/Iwf/dl/edict.pdf>. Accessed: 26 August, 2011.
- Gadio, C. M. (2011). Exploring the Gender Impact of the World Links Program: Summary of the Findings of an Independent Study Conducted in Four African Countries. (Online) Available: [http://www.world-links.org/english/assets/gender\\_study\\_summary.pdf](http://www.world-links.org/english/assets/gender_study_summary.pdf). Accessed: 26 August, 2011.
- Gaible, E. (2009). *Survey of ICT and Education in the Carribbean Volume1: Regional Trends and Analysis*. Washington D. C: The World Bank.
- Gaible, E. and M. Burns (2005). Using Technology to Train Teachers: Appropriate Uses of ICT for Teacher Professional Development in Developing Countries. (Online) Available: <http://www.mamma.com>. Accessed: 26 August, 2011.
- Haddad, W. D. and Drexler, A. (2002). The Dynamics of Technologies in Education. In Haddad, W & Drexler, A. (Eds.), *Technology for Education: Potentials, Parameters and Prospects* (pp. 9). Washington DC: Academy for Educational Development and Paris: UNESCO.
- Haddad, W. D. and Jurich, S. (2002). ICT for Education: Potential and Policy. In Tinio, V. L. (2002), *ICT in Education*. UNDP Bureau for Development Policy. (Online) Available: <http://www.eprimers.org>. Accessed: 26 August. 2011.
- Hannafin, R. D. & S. Savenye (1993). Technology in the classroom: The Teachers' New Role and Resistance to it. In *Educational Technology* (pp. 26-31). Vol. 33, No. 6. <http://world-links.org>
- Mckinsey & Co. (2005). Building Effective Public-Private Partnership: Lessons Learnt from the Jordan Education Initiative. In *ICT & Education: Issues and Opportunities*. (Online) Available: <http://www.mamma.com>. Accessed: 26 August, 2011.
- Merisotis, J. P. and R. A. Phipps (1999). What's the Difference? Outcomes of Distance vs.



Traditional Classroom-Based Learning (pp. 13-17). In Change.

Perraton, H. and C. Creed (2000). Applying New Technologies and Cost-Effective Delivery Systems in Basic Education. In Tinio, V. L. (2002), ICT in Education. UNDP Bureau for Development Policy. (Online) Available: <http://www.eprimers.org>. Accessed: 26 August. 2011.

Porta, E. (2010). Increasing Education Data Availability for Knowledge Generation. In ICTs & Education: Issues and Opportunities. Available: <http://www.mamma.com>. Accessed: 26 August, 2011.

Russel, T. L. (1999). The No Significant Difference Phenomenon. (5<sup>th</sup> ed.). Raleigh NC: North Carolina State University.

Tandon, N. (1998). Distance Education in the Commonwealth Countries of Asia. Appendix to Commonwealth of Learning: Barriers to Information and Communication Technologies Encountered by Women: Summary Report. (Online) Available: [http://www.col.org/wdd/BarriersICT\\_Asia\\_Report.pdf](http://www.col.org/wdd/BarriersICT_Asia_Report.pdf). Accessed: 26 August, 2011.

The Commonwealth of Learning (2002). An Introduction to Open and Distance Learning. (Online) Available: <http://www.col.org/ODLIntro/introODL.htm>. Accessed: 26 August, 2011.

Thornburg, D. (2002). Technology in K-12 Education: Envisioning a New Future. (Online) Available: <http://www.air-dc.org/forum/abthornburg.htm>. Accessed: 26 August, 2011.

Tinio, V. L. (2002). ICT in Education. UNDP Bureau for Development Policy. (Online) Available: <http://www.eprimers.org>. Accessed: 26 August. 2011.

UNESCO (2002). Information and Communication Technology: A Curriculum for Schools and Programme of Teacher Development. France: IFIP Working Paper.

World Bank (1998). The World Development Report 1998/99. In Tinio, V. L. (2002). ICT in Education. UNDP Bureau for Development Policy. (Online) Available: <http://www.eprimers.org>. Accessed: 26 August. 2011