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Information and Communication Technology (ICT) in Education and training

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ABSTRACT: Data and correspondence innovation, or ICT, is characterized as the mix of informatics innovation with other, related advances, particularly correspondence innovation. Most vital is the need to coordinate or imbue ICT definitively all through all school subjects. This paper introduces an investigation of the Iran National for Information Technology. The investigation uncovers that the arrangement is insufficient to affect emphatically on the Iran instruction framework, and that the philosophical casing of reference is business driven. The strategy puts little accentuation on the reconciliation and mixture of ICT in the nation's instruction framework. Arrangement suggestions and recommendations are offered to guarantee most extreme utilization of ICT possibilities in the Iranian educational system.

Keywords: Information technology, education, Iranian, technology integration

I. INTRODUCTION

Data and correspondence innovation (ICT) has turn out to be, inside of a brief while, one of the fundamental building societies. Numerous nations now respect understanding ICT and mastering the essential aptitudes and ideas of ICT as a major aspect of the center of training, close by perusing, written work and numeracy. Data and correspondence innovation (ICT) is a vital piece of the contemporary world. Truth be told, society and society must be changed in accordance with meet the difficulties of the learning age. The pervasiveness of ICT has achieved quick mechanical, social, political, and monetary change, which has eventuated in a system society sorted out around ICT (Castells, 1996).

Without a doubt, ICT has affected on the quality and amount of instructing, learning, and research in customary and separation training organizations. In solid terms, ICT can upgrade showing and adapting through its dynamic, intuitive, and drawing in substance; and it can give genuine chances to individualized direction. Data and correspondence innovation can possibly quicken, enhance, and extend aptitudes; persuade and draw in understudies in learning; serves to relate school encounters to work practices; serves to make monetary practicality for tomorrow's specialists; adds to radical changes in school; fortifies educating, and gives chances to association between the school and the world (Davis and Tearle, 1999; Lemke and Coughlin, 1998). Data and correspondence innovation can make the school more proficient and gainful, subsequently causing an assortment of apparatuses to upgrade and encourage educators' expert exercises (Kirschner and Woperies, 2003).

In examination, ICT gives chances to schools to correspond with each other through email, mailing records, visit rooms, etc. It likewise gives faster and simpler access to additional broad and current data, and it can be utilized to do complex scientific and factual counts. Moreover, it gives specialists a relentless road for the spread of examination reports and discoveries (Yusuf and Onasanya, 2004).

Taking into account an audit of 28 noteworthy reports on innovation joining in American Schools, Culp, Honey and Mandinach (2003) propelled three noteworthy explanations behind ICT in training. They proposed that innovation is generally (an) an apparatus for tending to difficulties in showing and learning, (b) a change operators, and (c) a focal drive in financial aggressiveness. As an instrument for tending to difficulties in showing and learning, innovation has abilities for conveyance, administration, and backing of powerful showing and learning. It is similarly useful for topographically scattered gatherings of people, and it additionally helps understudies to gather and understand complex information.

It additionally underpins differing and process-oriented types of composing and correspondence, and it increases the extension and auspiciousness of data assets accessible in the classroom. As a change specialist, it catalyzes different changes in the substance, systems, and general nature of showing and learning, There by guaranteeing constructivist request arranged classrooms. As a focal drive in monetary Aggressiveness, it manages monetary and social moves that have innovation aptitudes basic to future work of today's understudies.

This paper manages ICT in optional schools, and with the changing skills needed of both understudies and instructors in the event that they are to work viably in today's general public. It indicates an ICT educational module for optional schools, and layouts a going with project of educator improvement to execute such an educational module.

II. DATA AND COMMUNICATION TECHNOLOGY

ICT saturates the business environment, it supports the accomplishment of cutting edge organizations, and it furnishes governments with a productive framework. In the meantime, ICT increases the value of the procedures of learning, and in the association and administration of learning establishments. The Internet is a main thrust for much improvement and advancement in both created and creating nations. Nations must have the capacity to profit by mechanical advancements. To have the capacity to do as such, a framework of experts must be instructed with sound

ICT foundations, autonomous of particular PC stages or programming situations. Mechanical improvements lead to changes in work and changes in the association of work, and obliged abilities are in this way evolving. Picking up in significance are the accompanying skills:

o basic considering, o generalist (expansive) capabilities, o ICT skills empowering master work, o choice making, o treatment of element circumstances, o filling in as an individual from a group, and An optional ICT educational program ought to add to the building up of groups of experts with these new abilities. The utilization of ICT cuts over all parts of financial and social life. Innovative improvements in ICT are extremely fast. Innovation rapidly gets to be old obliging new aptitudes and learning to be beaten oftentimes.

III. EDUCATIONAL PROGRAME AND TEACHER DEVELOPMENT

Keeping pace with innovative improvement and the changing skills needed of both understudies and their educators obliges a state-of the-workmanship educational module and suitable instructor advancement.

A. A cutting edge educational module

The ICT educational module for schools displayed in the sections that take after is a best in class educational module. This educational module offers to schools and nations where ICT curricula are developing the establishments from which to progress quickly. It is not powerful to rehash the improvement process regarding ICT instruction that has officially occurred somewhere else since to do as such just eases off advancement and keeps establishments and nations from shutting the hole. Most vital is the need to coordinate or mix ICT genuinely all through all school subjects. Numerous open doors emerge from the consideration of ICT: the ICT educational module displayed in this Paper endeavors to encourage productive utilization of these open doors.

B. A modular curriculum

The educational module has been planned in measured shape so that instruction powers can choose suitable components to meet their targets at the period of improvement came to in their nations. Adequate nitty gritty portrayal of every target has been given so that reading material authors and instructive distributers can deliver course materials that meet neighborhood, social, and formative circumstances. On the other hand, astounding taking in materials from created nations may be adjusted to meet nearby circumstances.

IV. A CURRICULUM AND PROGRAMME OF TEACHER DEVELOPMENT

Instructors should be sufficiently arranged to actualize a best in class ICT educational program. Without a doubt, presenting any new educational program calls for cautious readiness, administration, resourcing, and proceeding with backing. On account of an ICT educational program, significantly more concerns must be considered. Instructive examination studies demonstrate that projects of expert advancement for instructors are best if coordinated to the phase of ICT improvement came to by schools. The ramifications of these exploration discoveries are that instructor improvement is best imagined as a progressing procedure, with numerous expert advancement exercises led in schools.

V. FLUCTUATING CONDITIONS ACROSS COUNTRIES

Circumstances and assets differ uniquely between nations, all of which will affect on the usage of any new ICT educational module and will influence how instructive frameworks adapt to change.

A. Adapting To Change

Quick improvements in ICT are hard to oversee for Ministries of Education, instructive administrators, and schools. A circumstance of consistent change is likewise standing up to showing staff and distributers. This ICT educational program has been intended to help adapt to these improvements what's more, circumstances of progress. It helps Ministries of Education to add to a methodical and controlled optional training ICT strategy. It additionally helps schools to create ICT efficiently and adequately in their projects, if need be starting with no outside help.

B. Nearby Circumstances

Circumstances shift in the middle of nations and between schools inside of a nation, and execution components have accordingly to be considered when outlining ICT curricula. The ICT educational module exhibited here offers to nations and schools an improvement system that makes note of these varieties in the middle of nations and schools. Different educational program acknowledge, each of which is unequivocally affected by social, societal and institutional components, can be built in a straight forward manner from the ICT educational program that is introduced. Schools and nations will have the capacity to develop an avant-garde educational module from the educational program system gave in a procedure in which particular needs, limitations as for assets, and other nearby circumstances are considered. The educational program permits instructive distributers and course book journalists to deliver learning materials in the social customs of their nation.

C. Availability of Resources

In any instructive framework, the level of accessible assets puts a confinement on the extent to which any new subject can be brought into the school educational program, particularly where just the most essential offices have so far been given. Be that as it may, ICT is of such significance to the future mechanical and business wellbeing of a nation that interest in the gear, educator training, and bolster administrations essential for the compelling conveyance of an ICT-based educational program ought to rank high in any arrangement of government needs. The educational module proposed makes note of these asset issues and determines least necessities for successful conveyance in distinctive circumstances.

D. Informatics

UNESCO characterizes informatics as the science managing the outline, acknowledgment, assessment, utilization, and support of data handling frameworks, including equipment, programming, hierarchical and human viewpoints, and the mechanical, business, administrative and political ramifications of these.

VI. DATA AND COMMUNICATION TECHNOLOGY

Data and correspondence innovation, or ICT, is characterized as the mix of informatics innovation with other, related advances, particularly correspondence innovation. In this book, these three definitions have been fell into a solitary, sweeping, meaning of ICT. This definition suggests that ICT will be utilized, connected, and coordinated in exercises of working and adapting on the premise of applied comprehension and techniques for informatics.

A. A Matrix for ICT Development in Schools

A two-dimensional lattice is created beneath that helps schools focus their phase of advancement with respect to the usage of ICT in the educational program. Along the even measurement are graphed the four ways to deal with ICT improvement portrayed to start with, while along the vertical measurement are the eight attributes of schools that identify with ICT advancement depicted quickly above in this part. Every phone of the lattice gives a brief picture or set of pointers of how a specific way to deal with ICT may look like in schools having comparative attributes. For every column of the grid, a school may discover itself all the more in one cell while being less included in different cells. Both the distinguished methodologies and the qualities of schools delineated in get from worldwide patterns in the utilization of ICT in training.

B. Supporting Infusion of ICT in Schools

Imbuing ICT all through a school needs (as in different regions of the school educational module) HR to backing clients' work and needs. Henceforth, there must be specialists or expert instructors why should accessible invest an extraordinary measure of energy going about as asset persons or ICT facilitators. Without this sort of human bolster, implantation sadly won't happen, however ideal other school components are in making a strong atmosphere for ICT. Here and there this bolster individual is additionally the person who instructs the ICT specialization units in a school, however different educators can likewise embrace this bolster part. The more particular ICT educational module units recorded under the ICT specialization in Appendix D will, obviously, should be

Taught by particular educators. Proficient improvement for these educators is not tended to here, other than to note that extra specialization on top of an instructor training capability is ordinarily embraced in tertiary organizations in branches of software engineering.

C. Role Requirements for Support Teachers in ICT

In this area, the more crucial part necessities of an asset individual or ICT co-ordinator are explained. Such a man will require the capacity to do the accompanying: Collaborate with the school administration and organization:

-be exact, in concurrence with administration, about their part, accessibility, and methods of intercession as per act;
- frequently illuminate administration about the advancement of exercises and undertakings;
-scatter the consequences of any analyses in the utilization of ICT attempted inside or outside the school;
-add to a worldwide view on necessities and means regarding ICT support for showing and learning. Be in charge of approach concerning specialized framework:
- be in charge of the accessibility and ease of use of PCs and systems inside of a school;
-be the mediator in the middle of school and equipment or programming suppliers, and in the middle of school and other instructive organizations. Bolster instructors in implanting ICT in their educating practice:
- propose lines of improvement for imbuing ICT by recommending,
demonstrating samples, or giving inspiration on the utilization ICT; o help instructors to be prepared, as per their needs and solicitations, by proposing preparing assets, by accepting instructional meetings, and by empowering the sharing of learning and encounters between educators;
- go with instructors once in a while inside of the classroom, to give reinforcement and to offer backing;
- support developing triumphs emerging from group tasks utilizing ICT. Offer backing to ICT group ventures:
- help instructing groups to make their ICT-based tasks more exact by demonstrating what is conceivable, setting cutoff points, and helping groups to indicate their preparation needs;
- help with arranging and booking of group ventures;
-help with usage, make assets accessible, and even join in the acknowledgment of undertakings;
-adapt to relations between educators in a group to guarantee that people concur with the points of a group venture, and to deal with any contentions inside of a group;
-help a group to assess procedure and results, and to calendar ventures in assessment of activities.
Advance ICT utilizes inside a school and encourage these employments:
-create and bolster the utilization of email, and offer correspondence arrangements by means of the school Intranet;
-talk about and set up systems for getting to and utilizing ICT assets, and achieve concurrence with clients about access;
-sort out how ICT assets can be gotten to and utilized by instructors and understudies. Backing specific understudy exercises with ICT:
-without taking the spot of, or without assuming the part of, different instructors, and in concurrence with these educators, help any understudies who face exceptional issues in utilizing ICT;
-compose exceptional instructional meetings, and mastermind gatherings of educators and understudies to show or

D. A National Policy for Information Technology

Keeping in mind the end goal to spouse the possibilities of ICT, most countries of the world have developed national Data and correspondence innovation strategies, to serve as a system for ICT reconciliation in all aspects of the general public. African nations, and especially Iran, are not special cases to this practice.
The computerized gap in the middle of cutting edge and creating nations, especially in Africa, is well
set up. Like most African nations, Iran as a country, came late and gradually in the utilization of ICT in all divisions of the country's life. Despite the fact that Africa has 12 for every penny of the aggregate world populace, the landmass has two for every penny vicinity in ICT use (Jensen, 2002). In Africa, there is low access to essential ICT hardware, low web integration, low interest in the
Improvement of ICT gear, and even low inclusion in programming advancement. Actually, New York City has higher Internet network than the entire of Africa (Ajayi, 2002; Hall, 1998).
The appearing backwardness of the African mainland in ICT required a landmass wide activity, the African Information Society Initiative (AISI), which had its source in the African Regional Symposium on Telematic for Development, held in Addis Ababa, in April, 1995. The symposium sorted out by the Economic Commission for Africa (ECA), the International Telecommunication Union (ITU), UNESCO, the International Development Research Center (IDRO), and Bellanet International, encouraged the ECA Conference of Ministers to consider the significance for Africa of the worldwide data unrest (Ajayi, 2002; ADF, 1999). In light of this suggestion, the ECA Conference of Ministers in May 1995 passed determination 795 (XXXl) titled 'Building Africa's Information Highway', which called for take a shot at national data and correspondence systems for arranging and decision-making as a major aspect of an African data parkway, and for the foundation of an abnormal state working gathering made up of African specialists in ICT, to set up Africa's entrance into the data society. In this way, in May 1996, the ECA Conference of Ministers through its determination 812 (XXXI) sanction the arrangement of activity arranged by the abnormal state working gathering entitled the African Information Society Initiative "An activity structure to assemble Africa's Information and Communication framework" (Ajayi, 2002; ADF, 1999). The AISI activity arrangement system required the development of National Information and Communication Infrastructure (NICI) arrangements and techniques.

This was to be an on-going process through arranging, execution, and general assessment of projects and pilot undertakings, created by necessities and needs of every nation (ADF, 1999). It ought to be focused on that Iran did not accomplish much on the NICI arrangement and procedures toward the start of 1999.

E. A National Policy for Information Technology and Education

Data and correspondence innovation (ICT) arrangement, as noted via Rowland (1996) and refered to in Hafkin (2002), can be sorted into vertical, infrastructural, and even strategies. Vertical ICT strategy addresses sectoral needs, for example, training, wellbeing and tourism. The infrastructural viewpoint manages the advancement of national foundation and this is firmly connected with telecom. The level viewpoint manages the effect on more extensive parts of society, for example, flexibility of data, duty and estimating, protection and security. These three perspectives are satisfactorily tended to in the Iran IT strategy. It is currently critical to analyze the report as it influences instruction. In making this investigation, the author has been guided by four key inquiries.

-What does the Iran national strategy for data innovation let us know about training?

-How satisfactory is the arrangement for the coordination of ICT in the Iran training framework?

-What suggestions are there for the Iran training framework?

- What motivation is expected to rethink the national arrangement to provide food for the nation's instruction?

Answers to these inquiries are expected to give a premise to rethinking and re-improvement of the Iran national strategy on data innovation (Federal Republic of Iran, 2001). In the first place, the record statement of purpose perceived the need 'To Use IT for Education' (p. iii). What's more, the general destinations in three (xv, xvi and xxiv) of the 31 expressed goals focused on that data innovation must be utilized to:

xv) Empower the young with IT aptitudes and set them up for worldwide aggressiveness.

xvi) Integrate IT into the standard of instruction and preparing.

xxiv) Establish new multifaceted IT foundations as focuses of fabulousness to guarantee

irania's intensity in global markets (pp. iv - v).

So as to accomplish these destinations, 20 techniques were sketched out. The fifth method was expressed in

thusly: "Rebuilding the training framework at all levels to react adequately to the difficulties and envisioned effect of the data age and specifically, the portion of an exceptional IT advancement store to instruction at all levels" (p. vi).

It ought to be underscored that albeit as the mission, general goals, and procedures perceived the significance of ICT in instruction, the archive has no sectoral (vertical) application to training. Issues identifying with instruction are subsumed under sectoral application for HR advancement. Under this sectoral application targets 1 to 4 identify with training as takes after:

-to add to a pool of IT specialists, researchers, professionals, and programming engineers; o to expand the accessibility of prepared work force;

- to give alluring vocation opportunities; and

- to create imperative aptitudes in different parts of IT.

With a specific end goal to accomplish the targets for HR advancement, nine noteworthy methods are

illustrated. These systems are focused at the building of learning and abilities in data innovation. These incorporate (a) making the utilization of ICT required at all levels of instructive

establishments; (b) advancement of ICT curricular for essential, optional, and tertiary foundations; (c) utilization of ICT in separation instruction; (d) ICT organizations interest in instruction; (e) study allow and grant on ICT; (f) preparing the coach plan for National Youth Service Corp individuals (g) ICT limit improvement at zonal, state, and nearby levels; (h) development of private and open segment committed ICT essential, auxiliary, and tertiary instructive foundations; and (i) working with worldwide and residential activities for exchange of ICT learning. Regardless of these destinations and procedures that are centered around training, the record is deficient to cook for the needs of the nation's instruction framework. A percentage of the lacks noted in the report are listed as takes after. To begin with, the arrangement has no particular extraordinary application to training. While there are sectoral applications for wellbeing, horticulture, craftsmanship, society, tourism; and administration, training is subsumed under human asset improvement. An ADF (1999) proposal unequivocally noticed the requirement for sectoral designation devoted just to instruction. Second, the targets and methodologies identified with instruction as reflected in the sectoral application for human asset improvement are business driven. Understudies are just being readied to obtain learning and aptitudes for future employments. The attention is just on finding out about ICT, which is viewed as 'Topicality', though for essential and optional schools the center is viewed as the early phase of ICT use in instruction (Cloke and Sharif, 2001). This rationality restricts the capability of ICT in training to a focal drive in monetary intensity. Its possibilities as a device for tending to difficulties in showing and learning and as change operators are in this way dismissed (Culp, Honey and Mandinach, 2003). Understudies require not find out about PCs just; ICT ought to be coordinated for the advancement and administration of showing and adapting in iran schools.

Third, educators are vital for effective finding out about ICT, and learning and instructing through ICT. PC training brought into the Iran auxiliary school following 1988 has to a great extent been unsuccessful as a consequence of instructors' inadequacy (Yusuf, 1998). Experimental studies have set up that educators' capacity and ability to utilize ICT and incorporate it into their instructing is to a great extent reliant on the expert advancement they get (Davis, 2003; Pearson, 2003; Selinger and Austin, 2003; Watson, 2001). The Iran national IT arrangement is noiseless on instructor training and educators' ICT proficient improvement as imagined by the audit of Culp, *et al.* (2003).

Adapting through ICT involves the advancement of broadly applicable connection programming for school utilization. The national approach does not perceive the need to make quality programming. An audit of 28 key arrangement archives more than 20 years in the United States (Culp, *et al.,* 2003) advances seven key proposals. The second underlines the formation of all the more excellent substance and programming. The accessible programming in Iran schools is transported in with no neighborhood content. The strategy archive does not address this issue. A further suggestion by Culp, *et al.* (2003) additionally incorporates an increment in examination, assessment, and appraisal. None of the issues significant to ICT application in the Iran instruction framework address the issue of exploration, assessment, and appraisal, all of which are discriminating to guarantee achievement. Examination, assessment, and evaluation ought to address access, proficient advancement, utilize and fitness, state of mind, et cetera. Furthermore, the report has no particular bearing on ICT or innovation arrangement at institutional levels. Propelled nations have particular arrangements for ICT. For example, in Britain the National Grid for learning activities, and the procedure for Education Technology, particularly tended to ICT issues in United Kingdom and Northern Ireland individually (Selinger and Austin, 2003). The iran national strategy does not give any rules on school innovation arranges. The ramifications of these insufficiencies are that the national strategy can't enough deal with the need of the iran training framework. Its instructive center is restricted to the business sector driven objective. The requirement for joining in showing and taking in, the requirement for quality expert advancement programs for pre-administration and serving educators, exploration, assessment and improvement, and the advancement of neighborhood connection programming are not tended to. These are real segments of value ICT application in training. In perspective of these deficiencies, there is a need to modify the iran national strategy for data innovation. Such modifications ought to be embraced to include partners in the region of training with the goal that they can guarantee that the strategy spreads issues identified with finding out about ICT and adapting through ICT. Moreover, the destinations in sectoral application ranges ought to address instruction particularly to expand the business sector driven goals. The incorporation of ICT into each part of showing and learning ought to likewise be the key core interest. Despite the fact that the issue of foundation is understood in the present arrangement, it ought to be explored in a manner that get to strategy is tended to in solid terms, since this is vital in ICT mix. Infrastructural needs must be tended to crosswise over zones and school levels. Since educators are fundamentally imperative to ICT coordination in instruction, the national strategy on IT should address the issue of educators' expert improvement. This ought to consolidate issues identifying with instructor preparing establishments and ICT, pre-administration educator training, in-service educator training, and measures for instructor ability and accreditation in ICT. Since examination, assessment, and appraisal are basic for ICT utilization in instruction, the national arrangement ought to recognize a casing of reference keeping in mind the end goal to gage accomplishment of ICT application in training. Such an edge of reference will empower refinement of school works on identifying with.

VII. CONCLUSIONS

Regardless of the way that Iran came late into the ICT world, the appropriation of the Iranian national approach for data innovation in 2014 is the right stride in ICT application in every division of the country's life. The report is intended to guarantee that Iran as a country perceives the vital significance of ICT for national improvement. Fruitful application in every division must be guaranteed through satisfactory scope of required territories. Distinguished crevices ought to be filled through the contribution of vital partners in training. Data and correspondence innovation is a capable instrument for the advancement of value showing and learning; it is an impetus for radical change in existing school practices and a veritable vehicle for setting up the understudies for what's to come. Accomplishment in the usage of an ICT approach will be reliant on the acknowledgment of the significance of sectoral application to training and feasible execution.

REFERENCES

[1]. African Development Forum (1999). The process of developing national information and communications infrastructure (NICI) in Africa. [Online]. http://www.uneca.org/adf99/nici.htm [Accessed December 2, 2004].

[2]. Ajayi, G.O. (2002). African response to the information communication technology revolution. ATPS Special Paper No. 8 [Online]. http://www.atpsnet.org/docs/Ajayi.pdf [Accessed Dec 23, 2003].

[3]. Castells, M. (1996). The Rise of the Network Society (vol. **2**). Oxford: Blackwell Publishers.

[4]. Cloke, C. and Sharif, S. (2001). Why use information and communication technology in schools? Some theoretical and practical issues. *Journal of Information Technology for Teacher Education*, **10**, (1 and 2), 7-18. [Online]. http://www.triangle.co.uk/jit/index.htm [Accessed October 1, 2004]

[5]. Culp, K.M., Honey, M. and Mandinach, E. (2003). A Retrospective in Twenty Years of Educational Technology Policy. [Online]. http://www.nationaledtechplan.org/participate/ 20years.pdf [Accessed October 1, 2004]

[6]. Davis, N. (2003) Technology in teacher education in USA: What makes for sustainable good practice? Technology, Pedagogy, and Education, 12 (1), 59-84. [Online]. http://www.triangle.co.uk/jit/ index.htm [Accessed October 1, 2004]

[7]. Davis, N.E. and Tearle, P. (Eds.) (1999). A core curriculum for telematics in teacher training. Teleteaching 98 Conference, Vienna [Online]. http://www.ex.ac.uk/telematics/T3/corecurr/ tteach98.htm [Accessed November 23, 2003]

[8]. Federal Republic of Nigeria (2000). National Policy on Telecommunications. Abuja: Ministry of Communication.

[9]. Federal Republic of Nigeria (2001). Nigeria National Policy for Information Technology (IT). [Online]. http://www.nitda.gov/docs/policy/ngitpolicy.pdf [Accessed October 1, 2004]

[10]. Hafkin, N. (2002). Gender issues in ICT policy in developing countries. An overview. United Nation's Division for the Advancement of Women (DAW) Expert Group meeting on Information and Communication Technology and their impact on and use as an instrument for the Advancement of Women, Seoul, Republic of Korea. [Online]. http://www.apc.org/english/capacity/policy/ mmtk_gender_ictpol_hafkin.pdf [Accessed Oct 1, 2004].

[11]. Hall, M. (1998). Africa Connected. First Monday, **3** (11) [Online]. http://firstmondaydk/issues/ issue3_11/hall/index.html [Accessed December 23, 2003]

[12]. Jensen, M. (2002). The African Internet. A status report. [Online]. http://www3.sn.apc.org/africa/ afstat.htm [Accessed December, 3, 2004]

[13]. Kirschner, P. and Woperies, I.G.J.H. (2003). Mind tools for teacher communities: A European perspective. *Technology, Pedagogy, and Education*, **12**(1), 127-149. [Online]. http://www.triangle.co.uk/jit/ [Accessed December, 23, 2003]

[14]. Lemke, C. and Coughlin, E.C. (1998). Technology in American Schools. Seven dimensions for gauging progress. Milken Exchange Commission on Educational Technology. [Online]. http://www.mff.org/ pubs/ME158.pdf [Accessed October 1, 2004]

[15]. Pearson, J. (2003). Information and communication technologies and teacher education in Australia. Technology. *Pedagogy and Education*, **12** (1), 39-58. [Online]. http://www.triangle.co.uk/jit/ [Accessed December, 23, 2003]

[16]. Selinger, M. and Austin, R. (2003). A comparison of the influence government policy in information and communications technology for teacher training in England and Northern Ireland. *Technology, Pedagogy and Education,* **12**(1), 19-38. [Online]. http://www.triangle.co.uk/jit/ [Accessed December, 23, 2003]

[17]. Watson, G. (2001). Professional development that engage with teachers' hearts and mind. *Information Technology for Teacher Education*, **10**(1 and 2), 17-19. [Online]. http://www.triangle.co.uk/jit/ [Accessed December, 23, 2003]

[18]. Yusuf, M.O. and Onasanya, S.A. (2004). Information and communication technology (ICT) and technology in tertiary institution. In E.A. Ogunsakin (Ed), Teaching in Tertiary Institutions (pp. 67-76). Ilorin: Faculty of Education.

[19]. Yusuf, M.O. (1998). An Investigation into teachers' competence in implementing computer education in Nigeria secondary schools. *Journal of Science Teaching and Learning*, **3**(1 and 2), 54-63.