THE ROLE OF EFFECTIVE INTEGRATION OF ICT IN EDUCATION, ESPECIALLY IN PRIMARY AND SECONDARY EDUCATION OF REMOTE SETTINGS

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Abstract: It is obvious that ICT (Information and communication Technology) is affecting all sectors of human activities such as business, entertainment, education, health, manufacturing industries, etc. ICT's are playing paramount role in the various sectors in different ways such as creating more opportunities for an efficient and effective way of handling their businesses, facilitating knowledge acquisition, sharing and utilisation that enhances quality of life, providing lifelong learning. Since education is one of the main keys to economic development and improvements in human welfare, the effective integrations of ICT's in the education sector to promote the education quality and accessibility is unquestionably becoming indispensible. This paper attempts to address the role of effective integration of ICT in education, particularly in primary and secondary schools, pointing out prevailing challenges and opportunities. Finally, it attempts to point out the how various stakeholders need to contribute for the effective integration of ICT in education especial in primary and secondary schools.

Keywords: ICT, Digital Technology, digital divide, education, lifelong learning

1. INTRODUCTION

The term Information and communications technology(ICT) encompasses all sorts of computing and communicating tools and techniques such as the computers, software's, networks, satellite links and related systems that allow people to access, analyze, create, exchange and use data, information and knowledge in ways that were almost imaginable (Association of African Universities, 2000).

Digital technologies are electronic tools, systems, devices and resources that generate store or process data. These include social media, online games and applications, multimedia, power points, productivity applications, cloud computing, interoperable systems and mobile devices.
All tools and techniques of ICT including both the former ICT tools and the recent technologies, have got paramount role in all aspects of human life such education, business, health, transport, entertainment, etc, thereby creating more opportunities for an efficient and effective way of handling their businesses.

The potential and role of ICT as a tool for contributing to development has received much attention in the literatures such as Willard & Andjelkonic (2005), Harris (2004), Lallana (2004), etc. According to the literatures, ICT is used for facilitating knowledge acquisition, sharing and utilisation in communities that in turn helps to **enhance the Quality of Life through** economic development, Social and services development, community arts and cultural developments, good governances, etc. lifelong learning is the guiding principle to enhance individuals' knowledge, skills and competences required for work and life. ICT be used to deliver education and training, including technical and vocational education and training, in both formal and

non-formal settings, at all times and in all places, as it can improve and diversify learning pathways, improve quality, and further reach vulnerable and underserved groups including rural youth and adults, women and girls, out-of-school youth, and people with disabilities. In short ICT's role in bringing social transformations is becoming indispensible.

Education is one of the main keys to economic development and improvements in human welfare. As global economic competition grows sharper, education becomes an important source of competitive advantage, closely linked to economic growth, and a way for countries to attract jobs and investment. In addition, education appears to be one of the key determinants of lifetime earnings. Countries therefore frequently see raising educational attainment as a way of tackling poverty and deprivation. Education offers a way to improve and update the skills and capabilities of the workforce. The role of integrating ICT's in the education sector can be examined in different ways such as reducing the costs, improving the efficiency of administration and the teaching learning, etc.

This review presentation focuses on the effective integration of ICT in education with an emphasis on primary and secondary schools. It attempts to point out how ICT's can effectively be integrated in the teaching learning, the challenges and issues that need to be addressed by the various stakeholders to overcome some of the challenges in achieving the benefits that ICT's can offer.

2. ROLE OF ICT AND DIGITAL TECHNOLOGIES IN PRIMARY AND SECONDARY EDUCATION

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The emergence of various Information and Communication Technologies (ICTs) and their increasing acceptance and adoption by society provide unique opportunities and could potentially promote education on a large scale. There is a general consensus among practitioners and academics that integration of ICTs in education has a positive impact on the learning environment (PrinceWaterhouse coopers, 2010).There has been growing interest in the use of ICTs in educational settings worldwide, and in developing countries in particular because of its great impact in the education sector.

Interventions have included investment in new computer classrooms, and schemes to provide teachers with digital tools such as laptops, digital camera, etc (Gallaher, 2008). The use of computers in education has realized many benefits. Research shows that ICTs can contribute to enhancing education in a development context in a number of ways (Julian M. Bass (2007)).

- Increasing the number of qualified teachers by accelerating teacher training (Unwin, 2004),
- Improving achievement levels by helping to counter adverse factors such high student :teacher ratios, shortage of basic teaching materials and poor physical infrastructure,
- Reducing drop-out rates by making learning more interesting and stimulating (e.g. Light, 2009),
- Overcoming geographical obstacles through distance learning (e.g. Rye, 2009) and
- Providing an opportunity to teachers to transform their practices with improved educational content and more effective teaching and learning methods.
- Improve the learning process through the provision of more interactive educational materials that increase learner motivation and facilitate the easy acquisition of basic skills. The use of various multimedia devices such as television, videos, and computer applications offers more challenging and engaging learning environment for students of all ages.
- Teachers and learners in the developing world are no longer solely dependent on physical media such as printed textbooks which are often times outdated. With today's technology, one even has the ability to access experts, professionals, and leaders in their fields of interest, around the world at any given time.

While it is unquestionable that ICT fosters accessibility and quality of the education programs at all levels, its impact is paramount especially in the primary and secondary schools. The fact that there is scarce resource and less accessibility to quality education in the traditional education systems in most primary and secondary schools especially in the rural settings of developing countries such as Ethiopia, this makes ICT more important in augmenting the traditional education systems.

As education has been a development priority on the national agenda by the Ethiopian Government, Ethiopia is working towards achieving the EFA (Education For All) goals as defined in the EFA Dakar Framework in 2000(Johna et.al,2003). The Government adopted the Education Sector Development Program (ESDP) in 1997 together with the Education Training Policy. The Dakar Frame Work introduced the following six educational goals:

1. expanding and improving comprehensive early childhood care and education, especially for the most vulnerable and disadvantaged children;
2. ensuring that by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality;
3. ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programmes;
4. achieving a 50% improvement in levels of adult literacy by 20015, especially for women, and equitable access to basic and continuing education for all adults;
5. eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls' full and equal access to and achievement in basic education of good quality; and
6. Improving all aspects of the quality of education and ensuring excellence of all so that recognized and measurable learning outcomes are achieved by all, especially in literacy, numeracy and essential life skills.

The Government of Ethiopia has adopted the goal of ensuring universal access to and completion of basic education and reducing the adult illiteracy rate by 2015.

The following are ten key strategies contained in the Geneva Action Plan which African Heads of States and Governments agreed to and signed (**FZAS, FZIE**)

1. To connect villages with ICTs and community access points;
2. To connect universities, colleges, secondary schools and primary schools with ICTs;
3. To connect scientific and research centers with ICTs;
4. To connect public libraries, cultural centers, museums, post offices and archives with ICTs;
5. To connect health centers and hospitals with ICTs;
6. To connect all local and central government departments and establish websites and e-mail addresses;
7. To adapt all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances;
8. To ensure that all of the world's populations have access to television and radio services;
9. To ensure that more than half the world's inhabitants have access to ICTs within their reach; and
10. To encourage the development of content and to put in place technical conditions in order to facilitate the presence and use of all world languages on the Internet.

It was also agreed that nations would operate within their economic strengths as they attend to these action plans aimed at bringing about a global information society.

Although the government has set educational policy goals, strategies and programs that aim at addressing the problems of access, equity, quality, and relevance in education, much more is expected from the entire stakeholder to gain the maximum benefit that ICT implementations offer in supporting the education system.

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3. CHALLENGES, OPPORTUNITIES AND THE ROLES OF STAKEHOLDERS IN EFFECTIVE INTEGRATION OF ICT IN PRIMARY AND SECONDARY SCHOOLS

Despite the efforts and the strategies in place, there are challenges in the effective integrations of ICT in education, in primary and secondary education in particular.

These challenges are related to insufficient infrastructure, the issue of digital divide, competences of the students & teachers in using ICT, cultural and social impacts among others.

- The most challenging condition to implement ICT strategy in Ethiopian schools is inadequacy of existing infrastructures (Fiseha, 2011). The inadequacy of infrastructural developments such as the distribution of computers, internet connectivity, etc is worse when it comes to rural setting than urban schools in the country. Hence such demand for increased infrastructural developments needs to be among priority area where financial plans are essential for schools to catch up with rapid changes and improvement in hardware, software and networks[8].

- The issue of digital divide is among challenges in the effective integration of ICT in school. Digital divide is the disparity between the peoples having and using the tools & techniques and those failing to have access and usability of the tools and techniques. The digital divide characterized by highly unequal access to and use of ICT, manifests itself both at the international and domestic levels. As the digital divide by itself have an impact in the education quality if ICT should support, this needs to be addressed by national policy makers. The digital divide can be narrowed and poverty reduction addressed through effective and focused utilization of ICTs in key sectors such as education. The adoption of ICT requires a business environment encouraging open competition, trust and security, interoperability and standardization, and financial resources for ICT.

- The fact that use of ICT requires reliable electricity supply, especially in many developing countries in rural and remote setting, remains to be a challenge in the effective integration of ICT in the schools.

- One of the big challenges of the uptake of ICT in schools on a large scale is the lack of teachers' competence and confidence in using ICT as a teaching aid and environment according to Leon Strous (2007). Most commonly used method to tackle this issue has been the organization of large-scale teacher training programs Teachers need to become aware of the potential and scope of the pedagogical usages of ICT. Teachers also need to acquire certain practical technical hands-on skills to be able to enter into pedagogical projects and larger-scale integration of ICT into and across the curriculum.

- Finally, the fact that there is a risk that ICT application will be used for ethically and morally questionable purpose is among challenges according to literatures.

Besides the various challenges in the effective integration of ICT's in schools there are a number of opportunities that all stake holders need to be aware of and take advantage of. Some of these opportunities in this regard are:

i. The fact that the Ethiopian government has set educational policy goals, strategies and programs that aim at addressing the problems of access, equity, quality, and relevance in education. For instance, the exploitation and application of ICT for educational development has been stated as major commitment area of the government, on the Ethiopian National ICT policy and Strategy (2009). The ICT policy has been set with the objectives such as ensuring ICT to be integral part of educational system for better quality & accessibility, ensuring that application and usage of basic computer literacy is accessed by broadening ICT culture and awareness through universal education.
   Among some of the strategies to achieve the objectives are: Upgrade schools curricula to include ICT education, achieve a critical mass of computer literate ICT teachers by availing training to teachers, Encourage the production, acquisition and mass distribution of educational materials, basic electronic media and facilities at affordable prices, Devise affordable financial packages and schemas for teachers and students to acquire ICT products including computer hardware and software.
   Hence, the existing set policies and strategies in support to expanding and strengthening the application of ICT tools in educational environment is among the opportunities to be considered.

ii. The prices of hard wares, network infrastructures and handheld devices such as smart phones is dropping significantly from time to time, that gave much opportunity for the wide spread of the devices and their uses especially in developing countries and rural settings.

iii. The fact that Non-governmental initiatives have included attempts to integrate ICT into rural and low income urban schooling according to Brewer, et al., 2005 stated in Julian M. Bass (2007) like several countries have attempted donor-led (Unwin, 2004) or government-led initiatives to expand access to ICTs in schools associated with a broader educational quality improvement agenda.

All concerned stake holders need to take part in various ways in order to address the challenges and gain the opportunities in the process of effective integration of ICT in the primary and secondary schools. Government bodies, industry partners and all other education stakeholders need to join forces and share resources to create equitable, dynamic, accountable and sustainable learner-centered digital learning ecosystems.

The use of ICTs in education calls for a fundamental shift in the way content is designed and delivered, as well as for teamwork and collaborative practices. Ongoing training is necessary for the trainers in institutions and organizations who are engaged in the design of curriculum, teaching materials, and delivery of ICT-enabled education so that they are equipped adequately to use ICTs in the classrooms. Not only are national policies necessary but the Government also need to assist in building organizational and

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institutional capacity to effectively deal with the complexities of integrating and implementing ICT in school education. In fact it is critical to source additional investments in the ICT infrastructure, to integrate ICT in the curriculum, and to facilitate the widespread diffusion of materials.

Support of school administrators and, in some cases, the community, is critical if ICTs are to be used effectively.

To guarantee equal access and to overcome the digital divide, Strong, sustainable partnerships between the Government, private sector and civil society needs to be built to offset costs and mitigate the complexities of the integration of ICT in education systems.

ICTs are only physical tools, which by themselves cannot bring benefits to students, teachers and communities at large. The involvement of private companies and NGOs, and the level of infrastructure, play determining roles for the effective integration of ICTs in primary and secondary education.

4. CONCLUSION

ICT can improve motivation, thinking and achievement across all subjects so they should be used as learning tools in all subjects. ICT enables students to construct and represent their own knowledge from the vast amounts of information, real-world and virtual environments available to them. Students operate ICT to inquire access, reflect on and manage information, to create, generate and test ideas and to evaluate and communicate their understanding with others.

ICTs are being increasingly used in education in both the developed and developing world, in order to reach out to children from poor and remote communities, provide them with a quality education, and in general equip both teachers and students with a wider range of educational resource and enable them with greater flexibility. However the growth and success of ICTs integrations in education, especially in the primary and secondary schools, depends on the extent to which the issues and challenges outlined in this paper are addressed.

5. REFERENCES

[1] Johanna Lasonen, Raija Kemppainen and Kolawole Raheem, 2005, "Education And Training In Ethiopia: An Evaluation Of Approaching EFA Goals", Institute for Educational Research, Printed by Jyvaskyla University Press Jyvaskyla, Finland.

[2] "The Role of Information and Communication Technology (ICT) in Enhancing Local Economic Development and Poverty Reduction". By S M Kundishora, Chief Executive Officer, Zimbabwe Academic and Research Network.

[3] Satish Jha, Leon Strous " ICT for Development and Prosperity", International Federation for Information Processing (IFIP), Published by IFIP Press Laxenburg, Austria.

[4] Julian M. Bass, 2011, An Early-Stage ICT Maturity Model derived from Ethiopian education institutions, International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2011, Vol. 7, Issue 1, pp. 5-25.Robert Gordon University, UK.

[5] Prince Waterhouse Coopers, 2010, "ICT in School Education" (Primary and Secondary).

[6] "ICT in Primary Education" Analytical survey, Volume 1 Exploring the origins, settings and initiatives. By Haif E. Bannayan (Jordan), Leslie Conery (USA), Ernesto Laval (Chile), Diana Laurillard (UK), Cher Ping Lim (Hong Kong), Sarietjie Musgrave (South Africa), Alexei Semenov (Russian Federation) and Márta Turcsányi-Szabó (Hungary).

[7] "Meta-survey on the Use of Technologies in Education in Asia and the Pacific" Year 2003-2004. Edited by Glen Farrell and Cédric Wachholz.

[8] Anne Nang'unda Kukali, "Opportunities and Challenges for Use and Integration of Information Communication Technology in Management of Public Secondary Schools in Bungoma South District, Kenya", 2013. International Journal of Science and Research (IJSR), India Online ISSN: 2319-7064, Volume 2 Issue 8.

[9] www.google.com

www.manaraa.com