Essay Competition for Information Systems and Computer Science Research Students at African Universities

This year EJISE launched a competition for research students at African universities. The objective of the competition was to provide academic publishing exposure to postgraduate students who represent the next generation of academics and ICT practitioners.

The nature of the competition was that anyone who was registered for a research degree with any University on the African continent could enter by writing a short paper entitled An assessment of the impact of ICT on higher education in Africa by the year 2020.

We are delighted to announce that the competition this year was won by Samar Abdelmageed from the Department of Business Administration, Ain Shams University, Egypt.

An assessment of the impact of ICT on higher education in Africa by the year 2020

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1. ICT in Higher Education: Why does it Matter?

The current era is witnessing changes at an unprecedented rapid pace in all aspects of life. Obtaining data, extracting information, and possessing the right skills to use this information to generate ideas is now becoming the key to individual success and national development. The great technological advancements and the rising challenges that should be met by societies have shaped new forms of thinking and generated additional requirements needed particularly by the developing countries in their educational systems to cope with the current global trends. Innovation and creativity are crucial factors in today's development which is mainly based on the evolution of knowledge-based economies.

The greatest and most important resource of developing countries is their people. However, what is required to realise the potential of this critical human resource and the possible development that they can achieve for their societies, is a modernised educational system. The majority of problems faced by the developing countries stem from low-quality educational systems that do not meet the requirements of today. This essay focuses particularly on higher education given that its importance has escalated in the recent decades. Enrolment rates have increased significantly especially in the emerging economies including different African countries (Tremblay, et al., 2012, p. 17 and McCowan, 2014, p. 6). The reasons behind this trend include: rising levels of urbanization, industrialization, technological advancements, female participation in education, in addition to people's aspirations to education as a means of social mobility (Tremblay, et al., 2012, p. 17). Moreover, higher education is now expected to qualify people to become knowledgeable, innovative, thereby contributing to a skilful, productive workforce that increases economic growth and accelerates the pace of development in the society (Adu, et al., 2014, p. 181). To achieve this goal, recent innovations should be employed in developing higher education systems. One of the most important tools that can be used in this regard is Information and Communications Technologies (ICT).

There are several benefits which are identified. ICT can help countries reduce costs of education delivery by decreasing the numbers of teachers or even venues required for teaching, abolishing time and place barriers for learners, and improving access to education (Sife, et al., 2007, p. 57; Youssef and Dahmani, 2008, p. 51; Asian Development Bank, 2009, p. 1; Pegu, 2014, p. 514). The use of ICT in higher education allowed for the creation of new forms of learning such as "E-learning", which may be described as an internet-based educational platform of interactions between students and teachers and among the students themselves (Sife, et al., 2007, p. 58). Opoku-Mensah (2015) estimated the size of the global e-learning market to reach $107 billion in 2015 compared to only $56.2 billion in 2014 and an expected value of $169 billion in 2018 (Opoku-

Mensah, 2015, p. 6). ICT, furthermore allows students to engage in more participatory ways in the learning process. This therefore enables a shift to a learner-centred approach in which the teacher is the main facilitator and guide to the educational process (Pegu, 2014, p. 515 and Talebiana, et al., 2014, p. 301). As a result, students feel more involved and responsible for their own learning, which can also help develop the skill of self-monitoring and discipline in them.

On the other hand, some argue that a high dependence on ICT in education delivery can lead to a less-frequent human interaction, weaker communication skills, newly-raised problems of information safety, and may not be suitable for some branches of science such as medicine where practice is of great importance (Vajargah, et al., 2010, p. 37; Brändström, 2011, p. 10; Arkorful and Abaidoo, 2014, pp. 402-403). Therefore, blended learning has emerged in which a combination of ICT and traditional face-to-face teaching methods are critical elements which ensure the quality of learning (Arkorful and Abaidoo, 2014, p. 400; Jeffrey, et al., 2014, p. 122; Lim and Wang, 2016, p. 3).

At the national level, governments can use ICT to increase the effectiveness of spending on education, improve the sustainability of learning, ensure an equal and rising access for people who may be prone to drop out from formal education, especially in remote often-neglected areas, linking all educational curricula institutions together, and promote innovation among individuals and groups (Asian Development Bank, 2009, p. 1; Pegu, 2014, p. 515; Hossain, et al., 2016, p. 131). These implications go for the usage of ICT either in school education or in higher education. At the end, all these benefits of course are reflected on all fields and aspects of the whole society.

ICT in higher education offers Africa major opportunities to develop this educational system and increase its efficiency. The next section discusses the present situation and future perspectives in this area.

2.   ICT in African Education- Present Situation and Future Perspective

Strategies for using ICT in education have been developed in Africa since early 2000 (Farrell and Isaacs, 2007, p. 7). A survey of ICT use in African education was conducted in 2007 by the Information for Development Program (infoDev) to investigate the situation of employing ICT in 53 African educational sectors (Farrell and Isaacs, 2007, p. 43). The following figure shows that about 68% of the surveyed African countries had a strategy for using ICT in education in 2007 compared to only 25% in 2000.
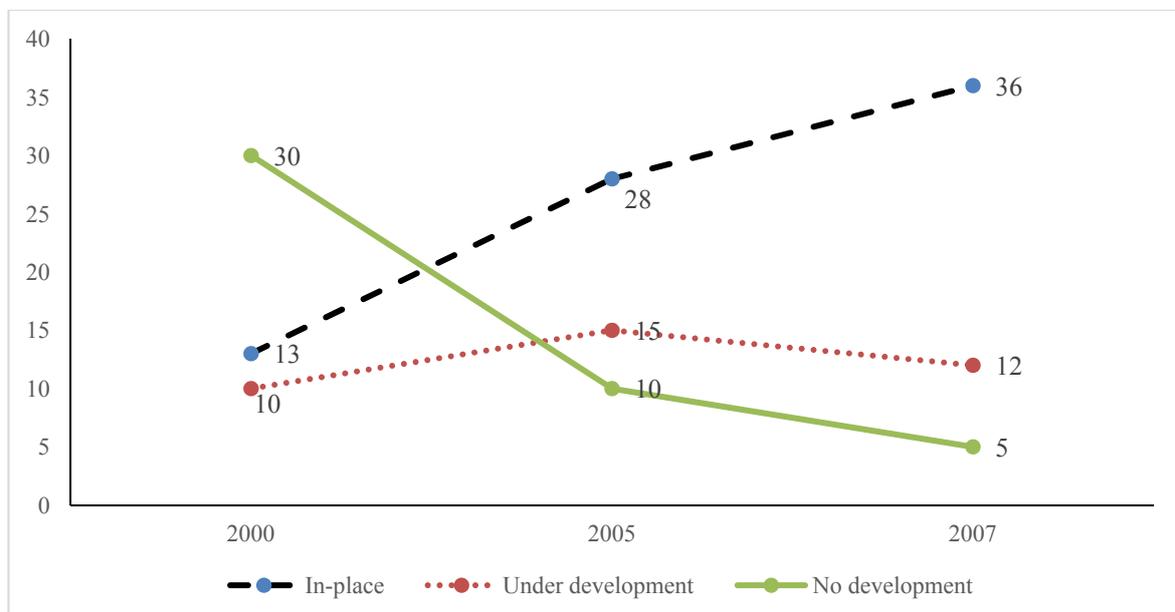

Figure 1: Strategies of ICT use in education in African Countries during (2000-2007)*

Source: (Farrell and Isaacs, 2007, p. 5)
*: Among 53 surveyed African countries

The African continent lacks the availability of recent data regarding the use of ICT in education (Internet Society, 2017, p. 7). However, Wallet (2015) indicated that by 2013-2014, 11 out of 46 countries in Sub-Saharan Africa (about 24%) had a policy on ICT in education and 12 countries (about 26%) had a national plan addressing this issue (Wallet, 2015, p. 9).

Several initiatives have been implemented to deepen the penetration of ICT use in higher education in different parts of Africa. Examples include Morocco's X.25, which is a network that connected 14 Moroccan universities nationwide. Sometimes the initiatives comprised a collaboration among institutions from several African countries. A clear example of this is the African Virtual Open Initiatives and Resources (AVOIR) that encompassed several African countries such as Mozambique, Nigeria, Senegal, South Africa, and Uganda and aimed to develop open-source and e-learning educational contents. Some African countries tried to overcome the cost obstacle by building local centres that offer access to the internet and other technological services such as the ICT villages in Madagascar, the community multimedia centres in Mozambique, and the cyber caravans in Mauritius (Farrell and Isaacs, 2007, pp. 10-12). International donors have also contributed in developing ICT use in education especially in East African countries such as Burundi, Kenya, and Rwanda (Hennessy, et al., 2010, p. 8).

Another annual survey that started in 2012 scans opinions about e- learning in 41 African countries (Isaacs and Hollow, 2012, p. 10). According to the last survey (Elletson and Burgess, 2015, pp. 52, 53, 55), 73% of the respondents saw that ICT in education equipped them with digital skills; 57% saw that educators are not aware enough of the potential benefits of ICT in education; and 65% of all respondents (and 74% among educators surveyed) denoted a non-sufficient support for developing ICT literacy.

The survey points to numerous challenges, faced in Africa, in employing ICT in higher education. The first and foremost challenge is the weak infrastructure whether in terms of low broadband width or in access to reliable supply of electricity and the unequal access to these resources between urban and rural areas (Farrell and Isaacs, 2007, p. 9). Second, the cost of using such a technology is still high and unaffordable. Some African governments look at technology as a non-necessary product, at least at the current stage of development (Hennessy, et al., 2010, p. 55). Another challenge is underdeveloped skills in using ICT. Wilson, et al. (2014) showed that despite of using social media frequently in their daily lives, students in Ghana lack appropriate ICT literacy and skills (Wilson, et al., 2014, p. 169). However, there are a number of chances that can be exploited. They include the partnerships established between the public and private sectors, the interest and help offered by donors, the increased internationalization in higher education, the undersea cable projects that have been initiated in the region, and the planning of some African countries such as Algeria and Rwanda to become a hub offering ICT services to the region (Farrell and Isaacs, 2007, pp. 9-10 and Tremblay, et al., 2012, p. 23).

The early and growing interest expressed by Africa for ICT use in higher education promises more progress. Adoption of policies that target the use of ICT in education by African countries shows the attention drawn to this area. As students are now becoming more familiar with latest technologies and use it frequently, governments will have the chance to spread the use of ICT in higher education. The increasing numbers of students enrolled in higher education will probably force African nations to think of more innovative ways of teaching and managing the educational process and ICT provides an efficient solution in this area. The future carries a lot of potentials for African nations. The next section discusses the opportunities for developing ICT use in African higher education.

3.   Opportunities for ICT in African Higher Education

Despite of the relatively high cost of technology for some African nations, the ongoing penetration of technology and the lowering of costs over time will improve the chances for more ICT use in higher education. The interest shown by the private sector and the international donors will also help promulgate ICT use and provide technologies needed. Investments by big international companies in infrastructure such as undersea cable projects will give more ICT access to students. ICT is also one of the best means to provide convenient educational access to groups that are most susceptible of dropping out such as females and residents of remote areas.

Based on the discussion above the following table presents an analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) of ICT use in African higher education.

Table 1: A SWOT Analysis of ICT use in African higher education

Strengths:	Weaknesses:
- Big youth bulge - Development of Strategies since 2000 - Mobile and wireless networks penetration - High enrollment rates in higher education - Public-private partnerships - The aim of some African countries to become an ICT hub - The increasing affordability of technology over time	- Outdated and weak infrastructure - Technological lag - Unequal access to internet and electricity - Relatively high cost of technology compared to standards of living - Other priorities set for development - ICT considered a "luxury" against other development priorities - Quality of distance learning is still suspected (traditional education is still the more preferable option)
Opportunities:	Threats:
- The increased levels of internationalization in higher education - Donors' interest - Undersea cable projects - Growing technology and high speed of technology transfer - Opportunities of cooperation with other countries and international educational institutions	- Rapid developments in the technological field and the difficulty of constantly coping with the pace of these advancements - Not enough Foreign Direct Investments (FDIs) in infrastructure projects - Insufficient financial or technological assistance received from donors

Source: developed by the researcher

4. Implications of Employing ICT in Higher Education: African Course of Development

The literature has shown the positive impact of ICT use in education on economic growth in developed countries (Jin and Jin, 2014, p. 78). Recent analysis also showed a general positive impact of using ICT on education (UNESCO Institute for Statistics, 2009, p. 15). The impact of education on economic growth is amplified when accompanied by improvements in ICT (Asian Development Bank, 2009, p. 1).

Employing ICT in African higher education will improve the efficiency and consistency of the educational process, promote innovation and creativity among students, and equip them with skills such as teamwork, interaction, and collaboration, which are at times valued more by employers in comparison to discipline-based academic knowledge. Moreover, students will feel more connected with real life needs and be more eager to learn. The result will be a high-quality labour force that attracts FDI, higher employment rates among university graduates and flexibility of shifting careers whenever needed.

On the social and political levels, ICT skills acquired by university graduates will empower them and aid in decreasing gaps between different societal groups, including between males and females or between urban and rural areas. This can help solve a lot of the problems faced by some African countries such as low participation rates of females in formal higher education, especially since there is evidence that the use of ICT has enhanced women's access to education (UNESCO, 2015, p. 21). Moreover, employing ICT in education will improve equality by disseminating the same skills among all students. The increased amount of skills acquired by students will equip them with self-esteem and confidence that will help them in all aspects of their lives.

5. The Future- Looking Beyond 2020

The future of ICT use in higher education looks promising. Despite all of the problems it faces, Africa has been working in this direction since 2000 and progress is accelerating. However, it should be noted the observed positive implications of ICT in education is not as high as in other sectors (Adeoye, et al., 2013, p. 178). It is not enough just to increase the role ICT in education. This should also be embedded within a bigger national strategy that focuses on promoting productivity (Hennessy, et al., 2010, p. 7). Therefore, the use of ICT in education should be embedded in the national policies of African countries, a continuous process of monitoring and evaluation should be implemented, partnerships with private business employers to detect the skills needed by the labour market should be established, and a high level of regional and international cooperation in this field should be maintained.

It is important to note that the rate of development of ICT use in higher education depends on the different conditions experienced by each African country. Countries that enjoy increasing economic growth rates and developments can focus more easily on accelerating ICT use in higher education compared to other countries

that are hit by conflicts or experience severe economic problems, for example. Therefore, it is important to set the priorities according to the case of each country and start with adopting ICT use in some higher educational institutions to identify best practices before expanding the experience. Increasing mobile penetration in the African continent can also help in this regard. Blended learning, empowering teachers with up-to-date skills, creating a new culture of learning that engage students more in the learning process, sharing country experiences, and seeking help from international donors may all help accelerate the use of ICT in African higher education systems.

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