

Transforming Africa into a Knowledge-based society: Concretizing the case for Digital Literacies and Revision of ICT Strategies in the Education Sector in the Region

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Abstract: In the recent past there has been a global push for the transformation of communities into knowledge societies as a strategy of achieving development. This transformation is expected to enable communities use knowledge to solve current societal problems, create employment, sustained democratic governance, and economic growth. Education is a key pillar in this process and in the African context of Africa, there is need to reform the educational strategy if countries in this region are to achieve this transformation. The new strategy should be include a curriculum reform to target digital literacies, intensive investments in ICT infrastructure in education sector, digitalization of curriculum content and re-alignment of human capacity among educators to the needs of knowledge-driven society. There is also need for continuous research on key knowledge society indicators to evolve best practices and ensure evidence-based approaches in ICT projects.

Keywords: knowledge-based society; Africa; ICT in education; Digital literacies; Information literacy, Multimedia literacy, Computer literacy, Communication literacy, suitable development.

1. Introduction

In the last 15 years there has been a global push to transform communities into knowledge-based society, whereby socio-economic development is driven by creation, sharing and application of knowledge to create new goods and services [1]. This transformation is expected to enable communities to harness local and global knowledge to create efficiency in the operations of private, public and civil organizations, spur economic growth and solve some of the current social problems [2]. This paper explores first, the current understanding of the concept knowledge society and how it can contribute to human development in Africa. Secondly, the paper examines key implications in bid to transform Africa into a knowledge society on educational practices on the continent.

The paper argues that for successful transformation to a knowledge society there is need for countries in the continent to align educational strategies to the needs of an knowledge society through revision of school curricula to include digital literacies which will enable youth and citizens to function and prosper in the knowledge society, intensive investment in ICT infrastructure in the education sector, and digitalize the curriculum content. It is also necessary to engage in human capacity building for educators in line with new needs, as well as adopt innovative pedagogical practices that assist learners to engage more innovatively with ICTs than ever before. These initiatives should be guided by best

practices learned through research and monitoring of ICT projects and indicators. At the same time Efforts must be made to avoid wastage of resources through poor planning and prioritization of ICT initiatives and exacerbation of the current digital divide.

2. Objectives

This paper is guided by the following objectives

- To review the current understanding of the knowledge society paradigm and its contribution to human development in Africa,
- To explore key implications of efforts to transform Africa into a knowledge society on educational practices and strategies on the continent,
- To investigate the key challenges and possible solutions in aligning education in Africa to the goals of a knowledge society.

3. Methodology

This paper is based on literature review undertaken to achieve the stated objectives. A meta-review search in relevant web portals and databases was carried to retrieve literature on relevant thematic areas such as the current status, implications, challenges and prospects of knowledge society in Africa, and integration of ICT in education in the region.

Three main sources of literature sources for used in this paper are:

- Databases of leading academic publishers on academic and research information Google Scholar, Springer, Educational Resources Information Center (ERIC), Ebscohost and Emerald.
- Development agencies, conferences, research organizations and initiatives that promote knowledge society such as IST-Africa, World Bank, Unesco, International Telecommunication Union (ITU), United Nations Conference on Trade and Development, Global e-Schools and Communities Initiative (GeSci), Information for Development Program (InfoDev), and International Development Research Centre (IDRC),
- Governmental agencies and NGOs specializing on the ICTs, education, research and development in Africa such as Africa Development Bank, United Nation Economic Commission for Africa (UNECA), African Economic Research Consortium (AERC), Research ICT Africa (RIA).

The literature search yielded over 200 articles pertinent to the issues under discussion. The author evaluated and selected a number of resources on the basis of relevance and quality. The findings from this analysis of literature are presented in thematic issues in line with the objectives of this paper. While this survey of literature is not exhaustive, the paper exposes some of the key issues that are critical in current debate on knowledge society, ICTs, development and education especially in Africa.

4. Results

4.1 *Current Understanding of Knowledge Society and its Implications for Development*

Knowledge society, also referred to as information society is an evolving concept used to denote a society in which knowledge is the primary production resource and socio-economic development is driven by optimal use of information products [3]. Such a society consciously generates and applies knowledge to create goods and services that lead to institutional transformation, prosperity of its people and human development [4]. In a knowledge society, there is a conscious effort to create, transform, share and apply knowledge in innovation and improvement of the quality of life of the people [5].

The main characteristics of knowledge society are:

- Epistemic generation, organization, and dissemination of knowledge and its application in culture, policy making and development strategies,
- The dominant role of ICTs in production, economy and society at large,
- Widespread use of information and lifelong learning to sustain innovation, and empower citizens
- Increased employment the country's working population in the knowledge-related services e.g. engineering, information and knowledge management and research,
- Globalization, economic and social cohesion-by establishing conditions for building borderless society and elimination of the "distance factor" [6] [7] [8].

The African continent has made tremendous progress in human development. However the region is still beset with the social, economic, and political problems that so often accompany underdevelopment such as high levels of poverty, gender, regional and ethnic inequalities, gross violation of human rights, the continued devastation of diseases, low level of scientific research and innovation, environmental degradation, and intolerance to cultural diversity [9]. Knowledge-based societies promote exploitation of human capital among the citizens to drive innovation and sustainable socio-economic development. It thus is expected that the transformation of Africa into a knowledge society will lead to:

- Creation of economic wealth and social goods for the community
- Empowerment of citizens and bring about societal change,
- Creation of a new generation of innovators
- Sustained innovation in solving social problems,
- Employment creation
- Social cohesion-by establishing conditions for building borderless society
- More efficient private , public and civil organizations
- More opportunities for the individual and community development [10] [11].

4.2 Aligning Education in Africa to the Needs of a Knowledge-Based Society

The worldwide focus on knowledge as the engine of national growth has led to a global race in which the acquisition of knowledge related skills has assumed prime importance [12]. In this context the main challenge for the African countries today is to gain in the so-called "skills race" or knowledge war" by developing in the young people and citizenry skills that will enable them to use knowledge in solving social problems [13]. Two key questions need to be asked: How does the continent harness the large pool of indigenous and global knowledge to reduce poverty, and improve life prospects for its citizens? How are the youth and citizenry in the region empowered to function productively in the knowledge-based society?

Part of the answer to these questions lies with education which is, world over recognized as critical to the realization of knowledge society because it is the main source of skills, and basis for access and creation of new knowledge, innovation and driver for the usage of ICTs. Education involves a process of learning, transmission, acquisition, creation and adaptation of knowledge [14]. Therefore it has the capacity to enable individuals and communities to develop the competencies, attitudes and values needed for full participation in knowledge society by learning to use, acquire, construct, evaluate and transform knowledge. However education to be of use in transforming the continent into a knowledge society a number of strategies must be undertaken namely: A strategy for intensive investments in ICT infrastructure in the education sector; curriculum reform to include digital literacies and other life skills; digitalization of curriculum content; human capacity building among educators; adaption knowledge society-friendly pedagogies, and research and knowledge building on indicators of transformation to knowledge society.

4.2.1 Investment in ICT Infrastructure in the Education Sector

The backbone of a knowledge society is a well-developed, well-maintained and affordable ICT infrastructure. ICT improvement is also recognised as a key factor in achieving economic growth, creation of employment and improving productivity and profitability in all sectors [15]. Availability of ICTs will also promote generation, sharing and application of knowledge to create new services and goods that will alleviate current social problems. Integration of ICT in education can assist in tackling some of the challenges facing education in Africa by improving efficiency of education system, facilitating distance learning and providing access to educational information resources, improving equity and access, educational management, the quality of learning, and imparting new skills for the knowledge society [16]. When applied to education, ICT will also promote “creativity, empowerment and equality and produce efficient learners and problem solvers” [17].

Despite making large strides in ICT, the African region still lags behind the rest of the world in the development of ICT in different sectors of life, due to inequitable access to ICT infrastructure, high cost of ICT services, and lack of relevant local information content [18]. Participation in a knowledge society is based on modern ICTs and therefore those in the education sector especially teachers and students need to have access to sustainable ICT networks, PCs or mobile devices, internet connectivity and sufficient technical support [19] [20]. Key measures in improving ICT infrastructure includes building computer labs and establishing broadband internet connectivity to educational institutions, implementing online distance and e-learning technologies e.g. virtual classrooms, platforms, and digital libraries and education management information systems [21] [22].

4.2.2 Curriculum Reform and Inclusion of Digital Literacies

The emergence of knowledge society has led to a review of the notion of literacy from narrow focus on the ability to read and write to include skills that enable the individuals to live in an information rich and ICT dominated society [23]. This entails acquisition of skills required for effective work performance, education and training, self-development and active participation in the new digitalized and networked cultural, socio-economic and political environment [24]. An enduring effort in the last two decades to define the literacies required by individuals to be productive in a knowledge-based society has led to need for a curriculum reform to include the so-called “twenty-first century skills’ notably computer literacy, multimedia literacy, and information literacy [25] [26] [27].

The case for computer literacy is that in the knowledge society individuals and communities interact on daily basis with ICTs to manage and share information. With the better access to mobile communications, increase in variety of digital media, and the extensive digitalization of data have improved the availability and accessibility of information in digital formats. At individual level the amounts of personal information that individuals need to handle has increased dramatically. Therefore the education system must address the need to use computer-based systems for both public and private data and anticipate a future world with changing technologies [28]. While African countries are banking on ICT to assist re-energize development and transform into knowledge-based societies there is evidence that current educational practices in the region do not support ICT skills development among the youth [29].

The key computer literacy skills required in the knowledge era include skills for personal productivity packages such as databases, word processing, spreadsheets, and statistical tools, skills needed for installation and management of relevant hardware and softwares as well online tools. Individuals should also have the ability to manipulate and store data electronic format in a way that facilitates efficient retrieval (e.g. documents, e-

mail, web favorites, tasks, contacts), and perform basic network diagnostics and security procedures such as virus/malware detection, scanning and protection [30] [31] [32].

In the contemporary society, media has become ubiquitous and young people are growing up in an environment dominated by internet, social media, and television [33]. The ubiquitous media technology allows citizens to create, access, and share information with others [34]. Increasingly media shape peoples' understanding of events and situations and therefore can be a powerful tool for social mobilization and for the young people media are a form of pedagogy, and tools of socialization and education and can be used to teach skills, as well as positive or distorted values, and awareness of the world. The media literate individual will be able to analyze media codes, conventions, criticize stereo type, values, and ideologies and interpret meanings and messages generated by media texts. Media literacy will help young people to discriminate and evaluate media content and use media intelligently [35].

Information literacy (IL) involves learning how to distinguish between good and bad information, locating, accessing, retrieving and using information resources in local libraries in both printed and e-formats. According to Horton [36] IL refers to skills, attitudes to realize when information is needed to solve a problem, make decisions, formulate that information need in searchable manner, search information silos efficiently for the information, retrieve, interpret, organize, evaluate its credibility and relevance, and utilize it to accomplish the purposes at hand. Information literacy is critical in the knowledge society in that it:

- Provides skills for today's learning which is not confined to traditional learning institution but includes self learning, informal learning, online, distance, e-learning and workplace-based learning,,
- Develops knowledge-society attributes in students such as critical thinking and problem solving skills, lifelong learning habits, self-development, and participation in society,
- Facilitates successful the use of innovative pedagogical practices such as active learning, constructivist approaches,
- Improves academic outcomes among learners by redusing information overload, inappropriate use of the electronic sources and plagiarism,
- Prepares learners to participate in the knowlege society where school graduates will use information and knowledge to sustain innovation, and create economic wealth and social goods for the community and achieve development [37] [38].

Communication literacy refers to the skills required for knowledgeable and ethical use of a wide range of communication channels, in various contexts and for different purposes (social interaction, team work, collaborative creation, media consumption and production [39]. The case for communication literacy is that in the knowledge society communication landscape is characterized by multiple technologies and tools of multi-dimensional nature, variety of media, serving various purposes such as interpersonal messaging, teamwork, special interest groups, knowledge building, collaborative problem solving, broadcasting and sharing of outcomes of projects.

The main communication skills/levels include the following:

- Basic skills of using different tools such as e-mailing, chatting, or contributing to collaborative projects, web logs, podcasting, posting of textual or visual information,
- Psychological and affective skills for use in varied dispositions and attitudes unique to the given situations
- Collaborative working/learning environments including computer-supported learning
- Writing skills including constructing logical arguments, reasoning from diverse evidence and sensitivity to audience [40].

Besides the above discussed skills many twenty-first century writers also emphasize the following skills for the learners and citizens of the knowledge society such as life skills, creativity and innovation, and collaboration skills [41]. Life skills include information ethics, leadership, accountability, and self-determination, personal productivity, and personal responsibility. Creativity and innovation are critical to solving societal problems. Collaboration skills are essential because in today's world there intensive use of networks and network-based tools for collaborative activities which requires teamwork as well as coordination.

4.2.3 Capacity Building in the Education Sector

In the knowledge society era, educational institutions and stakeholders are expected to make policy and operational decisions that affect the integration of ICT in schools, teacher training institutions and in administrative zones. These decisions include those related to the use of ICT in learning, establishment of ICT infrastructure, financial commitments, software and manpower recruitment and training [42]. Several factors slow the integration of ICT in education in Africa including poor teacher and administrator attitudes and beliefs, ineffective ICT leadership strategies, constraints of traditional institutional structure, poor coordination of ICT investment among agencies and the levels of government, lack of skills among classroom teachers to integrate ICT effectively or collaboratively and lack of research to assess the efficacy of ICT projects and develop best practices [43]

To be effective ICT decisions need to be guided by good understanding of ICT and commitment which implies a critical need for capacity building among educators at the different levels. Key areas of ICT human capacity building in education sector include appreciation of the benefits of ICT in education and the different elements of ICT infrastructure, policy and strategy making process, formulation and implementation of ICT projects. These will lead to educational leaders with vision for ICT and appropriate competences to effectively coordinate the implementation ICT projects. To achieve effectiveness in capacity building initiatives should be tailored to address the needs of different players such as teachers, heads of schools, school management boards, as well as teacher trainers.

Experience has shown that in the integration of ICTs in education especially inside the classroom, teachers are key players [44]. Therefore there is need for a strategy to provide them with ICT competences to enable them make positive use of various ICTs in the knowledge- society setting. Beyond the traditional leadership skills, new skills such as computer and information literacy which enable teachers to access information resources and apply it innovatively are needed. Other competences include skills for digital content development, deployment of ICT in classroom environments, special needs, use of e-learning techniques and curriculum design implementation and assessment [45]. Due to the rapidly changing ICT landscape, the teaching fraternity including teachers and teacher educators also need to have access to relevant, timely and on-going professional development that focuses on ICT.

4.2.4 Research, Monitoring and Best Practices into ICT Integration in Education

Integration of ICTs in education will succeed only if there is effort to know what works and what does not. Policies and strategies on ICT integration in education should therefore be based carefully researched knowledge on the different aspects of ICT in education and best practices. This calls for continuous research on key indicators such as ICT skills for pupils and teachers, status of ICT infrastructure (student/PC-internet access-points ratios, electronic gadget ownership) and progress in the deployment of educational technologies (e.g. teaching aids, smart classrooms, web 2.0, e-learning environments and digital libraries). There is also need to gauge the progress in the development of resources such as

digital libraries and other teaching aids [46]. Monitoring and evaluation is also required on the impact of ICT on efficiency and educational performance generally and also on the impact of specific ICT programmes [47].

5. Challenges and Way Forward in Aligning Educational Practices to Knowledge Society

The transformation of African communities into knowledge societies faces various challenges. First, ICT infrastructure establishment requires large up-front investments and large recurrent costs. Poorly planned projects can also result in the use of funds without any tangible results. For example without proper training and pedagogy, providing access to ICT infrastructure to the sector does not advance education [48]. There is also evidence that ICTs may be most cost-effective when placed in common areas such as schools, libraries, community centres, school laboratories rather than giving them to individual pupils [49]. The issue of prioritization is therefore very critical and the question to ask is what really should come first in digital migration in the education sector. Is it provision of classrooms and desks or is giving laptops to primary school pupils and can both be achieved simultaneously? There is need to “prioritize the various priorities” and avoid biases in the approach to ICT and guard against “the hype of techno-utopia and techno-fixes to the problem of ICT, education and society” [50].

ICT initiatives involve the risk of digital divide due to differences in terms of access, training, skills, and the actual use of information technologies. Digital divide can increase existing social polarization and differences in social capital, and eventually wealth based on gender, class, ethnic communities and geographical regions [50]. The risk of digital divide calls for policy guidelines around equity and best practices in integrating ICTs in education. This will help open up opportunities children with disabilities, those from poor backgrounds, girls and those in rural and who are traditionally marginalized in education using ICT.

6. Summary, Conclusion and Recommendations

The knowledge society provides a useful framework for social transformation and development and can help the African continent harness the benefits of global knowledge and as well as creativity and innovativeness of its human capital. It can unlock the talents of individuals and communities and bring about empowerment of citizens to bring societal change, sustain innovation in solving societal problems, create new employment opportunities, and cultivate social cohesion by creating social capital, social homogeneity and economic wealth and social goods for the community.

In order for education in Africa to assist in transforming the region to a knowledge society there is need for it to be aligned with the requirements of a knowledge society. There is need for curriculum reform to include digital literacies, a strategy for investments in appropriate ICT infrastructure, digitalization of curriculum content, capacity building in the education sector. For effective alignment of education with the requirements for a knowledge society, it is important avoid unrealistic expectation from ICT investments. It is also necessary to conduct research on the impact of ICT in education and monitor changes its key indicators in this education sector so as to come up with the best practices. This will ensure that exacerbation of the current digital divide and wastage of resources due to poor planning of ICT initiatives are avoided.

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