Knowledge Societies: Empowering through ICT4E

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ABSTRACT
Within a framework of development, this paper discusses the current estate of education access as well as some of the current challenges for the implantation and design of ICT initiatives in developing countries, and reflects on the new shift of paradigm in the field of ICT4E. These challenges can be overcome by applying methods that merge their implementation model with local ownership. Technological literacy from a local context perspective is presented as an effective model to foster social stability, sustainable development and socio-economic growth.

Through an examination of the goals and initiatives undertaken by the GeSCI, the idea of a new framework for collective empowerment and social change is presented. To better understand the dynamics between local context and ICT4E, the socioeconomic background of the digital divide is analyzed. Finally, the article establishes the links between empowerment education and the creation of knowledge societies that turn physical networks into digital human interaction.

Categories and Subject Descriptors
H.1.2 [**Models and Principles**]: User/Machine Systems – *Human factors.*

General Terms
Human Factors.

Keywords
Knowledge society, Empowerment education, ICT4E, GeSCI, Development, Interaction.

List of Abbreviations and Acronyms
GeSCI - Global e-Schools and Communities Initiative
ICT - Information and Communications Technology
ICT4E - Information and Communications Technology For Education
ICT4E&D - Information and Communications Technology For Education and Development
MDG - Millennium Development Goals
UN - United Nations

1. INTRODUCTION
The UN's Millennium Development Goals (MDGs) have become the referential spearhead of global development initiatives. The second goal of the MDGs, *Achieve universal primary education* established that education is one of the basic factors that induces a higher standard of living, by contributing in the reduction of poverty, and facilitating economic growth [17]. As the ties between economic growth and development begin to falter, and as the unambiguous relationship between economic growth and poverty alleviation begins to be questioned, the notion that education is one of the main motors for development of society seems undeniable. It empowers communities and enables them to engage in wealth generating activities, which leads to the creation of employment, establishment of social stability, sustainability, and prosperity.

However, the access to education is restricted by economical, geographical, and social factors that feedback the current inegalitarian system [14]. Resembling a limited natural resource, education has become a standardized commodity that flows in abundance in the wealthy regions of the world but lacks in access, quality and outcome in the developing countries. As a result, and based on the foundations of Papert & Harel's [11]

Constructionism, the concept of ICT4E developed. The creation of technological literacy and the development of new technological skills, like problem solving skills, collaboration skills, critical reading, and information retrieval, become fundamental for the introduction of ICT into educational systems and institutions, along with computer literacy, media literacy courses, as well as new teaching and learning methods [5]. The opportunities and advances offered by ICTs are the driving force in battling the challenges of development, as a major tool for the dissemination of knowledge, skills, and capabilities that spark social advancement [10].

This new shift of paradigm in the educational field is twofold: as computer technology and electronic digital media can provide interactive tools, new dynamic methods of learning will be enabled; the introduction of ICT4E strategies allow to bridge or minimize some of the main obstacles to education in developing countries.

However, as Härtela [8] points out, there is an inherent challenge in the use of ICT4E, revolving around the process of implementation of the ICT strategies, which is too often underestimated. Technologies are deployed without enough training to the teachers, while students are more up to date with the newer trends; the infrastructure is usually below the standards necessary for a proper implementation; and programs are not always continued only after a few years of implementation. These key issues have a deep impact on the image of ICT4E and damage its reputation. For a cause that relies on third parties to move forward, this is obviously a pivotal problem that could lead to donor discouragement and fund reduction, thus hindering future initiatives.

2. GeSCI's MODEL: IMPLEMENTING ICT4E IN DEVELOPING COUNTRIES

The Global e-Schools and Communities Initiative (GeSCI) was created by the UN ICT Task Force in 2003 with the aim to assist developing countries that request guidance to take advantage of the potential of ICT to improve the quality, effectiveness, relevance, and access levels of their education systems.

According to the UN's press release that announced the GeSCI's foundation; "the initiative seeks to connect thousands of schools and villages in the developing world through information and communication technologies (ICT)" [16]. GeSCI's mission (http://www.gesci.org) is "to support the development of the capacity of developing countries to use and integrate ICT in teaching, learning, research, innovation, and training administration for the creation of a knowledge society. A knowledge society for all". There is a clear recognition of the pivotal role of education in creating long-term, sustainable development and how the usage of ICT in educational systems contributes to a higher quality of the education, community empowerment, and socio-economic growth.

The need to bridge the key issues of image and reputation derive into a holistic approach of development and aid efforts, by merging the concept of social capital, which tries to capture relations between economic authors, with "trust" and "networks" becoming two central concepts [2]. Thus GeSCI aims to create an ICT education model that is both comprehensive and efficient, and that can be carried out by other organizations rooted in the countries of application. The result is to conceptualize an organizational architecture that converges with informational objects, which are created, modified or terminated by the technical components. In other words, the conceptual automatization of the application of ICT strategies, which could decrease the implementation costs, empowering communities and surpassing the main inequalities of the poorest sectors of the developing countries and regions.

Applying models can be a great tool for conceptualizing and saving time and costs in theory (or in closed system environments), but it can also jeopardize the adaptation of strategies as it could lead to improper acclimatization to each local context. More time and resources are needed to fully adapt a ready-made package.

Accordingly, in order to consolidate the processes and minimize the fluctuation of the models, the role of GeSCI revolves around facilitating and supporting ICT4E initiatives, actively focusing into 5 main tasks:

- To coordinate all the actors that want to contribute in the e-school area and show them how to fulfill that role.

- To provide guidance and know-how to the nations and regions that will take in one of the projects.

- To raise funds, gather resources from governments, communities or even non local foundations or private companies willing to donate or help.

- To facilitate specific global services aimed to server multiple projects in multiple locations, profiting from economies of scale.

- To evaluate and monitor the evolution and outcome of each project, not only to manage the progress and try to achieve success, but also to allow the transparency needed by donors to be sure their efforts are not in vain [16].

By providing assistance with planning of ICT4E initiatives and contributing with knowledge and experience in drafting of national plans, GeSCI encourages countries and regions to take ownership of each project [4], both adapting the strategies and models to the specificities of their local characteristics and encouraging locals to adopt the projects as native.

3. ASPECTS OF A SOCIOECONOMIC DIGITAL DIVIDE

The extensive research available on education in developing countries over the past 50 years shows that rates of return on investment are generally very high, however skepticism among donors and investors is still high [9]. The cases of alleged corruption, misuse and the digital divide tend to overshadow the cases of communities empowered by education and ICTs.

It is precisely this digital divide what poises the most serious threat to the development of ICT4E initiatives. It embodies the inequalities in the physical access to digital information and communication technology due to infrastructure and equipment, as well as the inequalities in resources and capabilities to effectively use the technology. The former secretary-general of the UN Kofi Annan, related the efforts of GeSCI tightly to this issue: "If we are to bridge the Digital Divide, we must match the powerful new tools of development with the people who need them most. The GeSCI does just that, and has the potential not only to improve education, but also to empower people, strengthen governance, open up new markets and galvanize our efforts to achieve the Millennium Development Goals" [16].

However, the digital divide is increasing rather than decreasing, as the newest ICT innovations always derive from richer areas of the world, where funding, infrastructures and, above all, economical profitability are higher. On the contrary, developing countries not only receive what donors and organizations provide, but also tend to get equipment on the brink of being obsolete. Without clear economical profit, there is no foreseeable scenario, in the current state of global trade, that will deploy the latest ICT innovations equally around the globe. It is also debatable if this would do any good as long as developing societies are not prepared to use them.

Thus, the digital divide is a deeply misleading discourse: the divide is not digital but socioeconomic, however representing the divide in technical terms suggests technical solutions [12]. In the same manner, it seems clear that access to technological innovations on its own does not be enough to ensure economic development towards a knowledge society. It is vital to also develop the capacities and skills of the population in order to use those technological innovations. Only through education is there a possible proper integration of ICT into developing countries. Hence, the need to add an E on ICT4D seems so appealing, in GeSCI's approach

But the digital divide is only one of the many challenges that the field of ICT4E&D faces. GeSCI tries to uncover some of them, raising flags that need proper consideration and research, otherwise the investment and utilization of ICTs will simply lead to undesired results. Among these challenges, also appear; the rush to adopt the new technologies in education; the focus on technology rather than on education; lack of adaptability to each region's needs; lack of flexibility to adapt to the learners' knowledge; lack of balance between technology and the traditional classroom; the strain that new technological knowledge play on teachers; the difficulty in assessing the content to be used in ICT-based learning [13].

4. THE RISE OF KNOWLEDGE SOCIETIES

Empowerment by education goes beyond the improvement of self-esteem or efficacy. It is meant to drive social change through the individual, group and systemic perspective [6]. Freire's framework aims to raise awareness of people's social and historical background of current challenges and issues in order to develop social action strategies that come from within the group [1]. By educating the population about their own problems, new processes can be found to reaffirm their capabilities to drive and define their personal and social future contexts.

GeSCI's approach fits precisely the empowerment education, promoting collaborative knowledge production and the creation of capacities with *local* in mind, in order to lay the foundation of a research agenda that will procure development research and innovation in ICT-Education. Through this research, GeSCI looks for community networks to strengthen the capability of researcher institutions and policy makers in partner countries to do, and use, ICT-Education research, in order to achieve qualitative change and improvement in educational provision, and to contribute their voice to the literature [3]. Connectivity is no longer enough. A networked society without the empowerment of education and knowledge cannot look forward to take the reins of their own destiny. Knowledge is necessary to effectively make use of those networks, fostering empowering interactions. Hence, the mission of GeSCI is "to support the development of the capacity of developing countries to use and integrate ICT in teaching, learning, research, innovation, and training administration for the creation of a knowledge society".

According to Department of Economic and Social Affairs of the United Nations, "the Knowledge Society is one in which institutions and organizations enable people and information to develop without limits and open opportunities for all kinds of knowledge to be mass-produced and mass-utilized throughout the whole society". Accordingly, the knowledge society is more of a collective mindset, or a distinctive way of life that a society may adopt. At its best, it involves all members of the community in mass production and mass utilization of knowledge, supporting the goal of high quality and safety of life, rearranging social institutions and organizations accordingly [7].

These emerging knowledge societies, being societies of the intangible and network societies, still are deeply dependable in effective ICT strategies. In the context of the information revolution, the forms of organization have been created in a way that no longer conform to the logic of spatial centrality and the poles of conventional decision-making [18]. However, the idea of information society is based on technological breakthroughs, whereas knowledge societies entail much broader social, ethical and political dimensions.

5. CONCLUSIONS

There is an undeniable positive contribution of ICTs in the efforts for the development and the consecution of the MDGs. However, due to the idiosyncrasies of ICTs, the implantation of innovative advances in developing countries are futile if they do not go hand by hand with the proper training to both users and practitioners. The impact of new technologies is limited if the population that is supposed serve, does not know how to use or cannot understand the reasons and benefits linked to it.

This realization points to a new shift of paradigm in the field of development, driving new efforts towards education. A simple networked society is simply insufficient. Only through the improvement of educational systems that empower people to reaffirm the value of the identity of the self and local culture can we truly start to balance the power relations in policy making and minimizing the effects of the digital divide. Without the focus on local context, there will always be a disconnection between needs and solutions, enforcing a development dependant on foreign aid that does not really solve the underlying issues.

By designing a new framework for action, GeSCI's empowerment education are laying the foundation for true Knowledge Societies that through the power of ICTs not only connect, but also interact. As Uimonen [15] states, the individualization and globalization that are prominently manifested in the libertarian and cosmopolitan ethos of the culture of networking, slowly fade as we embrace the knowledge society, whose basic nature emanates from the collective mindset of its individuals.

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