Concept note:

Building Leadership Capacity for ICT and Knowledge Societies in Africa

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Background

The Global e-Schools and Communities Initiative (GeSCI) was established in December 2003, borne out of the work of the United Nations ICT Task Force which identified education as an area in critical need of development, and one where information communication technology (ICT) has the potential to make positive and transformative impacts. The Task Force approved the establishment of GeSCI - a UN-affiliated global partnership which would provide demand-driven assistance to developing countries seeking to harness the potential of ICT to improve the quality, effectiveness, relevance and access levels of their education systems.

In 2010 GeSCI, working together with the African Union Commission (AUC) and other African partners, will engage in the development of an African Leaders in ICT (ALICT) programme designed to intensify activities to implement the African Regional Action Plan on the Knowledge Economy. The ALICT programme is based on the African Regional Action Plan for Knowledge Economy (ARAPKE) and is well aligned with the framework of the EU-Africa Strategic Partnership 8th on Science, Information Society and Space (Africa-EU P8).

The ALICIT programme presents a feasibility action for modelling a methodology and multi-stakeholder approach for capacity building and awareness raising of African Leaders on the issues of the Knowledge Society, ICT, Education, Science & Technology and Innovations in support of the AUC Action Plan and the EU-AU P8. The model will build on, as well as extend and strengthen one of the African Union Commission's (AUC) flagship projects, African Leadership in ICT programme (ALICT). The model will be developed and tested in East and Southern Africa in close collaboration with AUC.

The implementation mechanism for ALICT will be based on GeSCI's regional African Knowledge Exchange (AKE) multi-country partnership programme. The AKE presents a good basis for an implementation mechanism via collaborative learning, multi stakeholder knowledge sharing and virtual collaboration, including the hosting of communities of practice and alumni networks. The ALICT will therefore be used as a platform and further developed according to the latest research and understanding of how the required leadership

capacities can be built in a highly challenging cross-sectoral and multi-stakeholder environment.

This paper examines three themes on promoting effective leadership for improving organizational capability in the use of ICT in education systems to stimulate innovation and contribute to the development of Knowledge Societies. The themes examine organizational change within a framework of national and institutional educational **goals, technologies and structures.** The themes are:

- Knowledge Societies and Economies as the Core of National Visions and Goals
- The Knowledge Economy Pillars of Education, ICT and Innovation and their Implications for the Technology Core of the Traditional 'Grammar of Schooling'
- Creating Structures for Promoting Capabilities and Fostering Educational Innovation towards the Development of Knowledge Societies for All

1. Knowledge Societies for All as the Core of National Visions and Goals

We are living in times of unprecedented change. It is change characterized by technological revolution based on human expression and human knowledge (Addo 2001, p144). Information and Communication Technology is speeding up the global flow of information (Dahlman 2007, p3) and facilitating the creation of libraries of world knowledges that represent different ways of seeing and knowing the world (Spring 2008, p332), and that are in continuous generation and regeneration (Nampota *et al.*2009, p62).

We are engaged in a struggle of ideas to define the new type of society that is evolving as a result of the accelerated global knowledge creation and dissemination trends. We describe it alternately as the 'information society' (Castells, 1996) (cited in Spring 2008, p333), the 'networked society' (Barnety, 2004) (cited in Sachs 2008, p191), the 'audit society' (Power 1999) (cited in ibid.), the 'risk society' (Beck 1997) (cited in Seddon & Carins 2002, p735), the 'learning society' (CERI 2000 cited in ibid.), or the 'knowledge society' (Drucker 1969) (cited in UNESCO 2005, p57).

In the new economic models that are developing, it is indeed knowledge rather than capital that is generating new wealth. Drucker (1993) (cited in Spring 2008, p337) contends that the

power is shifting from 'owners and managers of capital' to 'knowledge workers'. Watson *et al.* (2003, p1) (cited in Nampota 2008, p62) identify scientific and technological knowledge as the critical inputs for economic development in the new societies. The authors argue that in future, the ability of countries to access, comprehend, select, adapt and use scientific and technological knowledge will increasingly be the determinant of material well-being and quality of life in relation to advances in agriculture, health, new sources of energy and higher levels of productivity. Dahlman (2007, p14) points out the importance of organizational, managerial and policy knowledge to provide effective health, education or business services as also critical for development to new knowledge economies and societies.

The emergence of the 'knowledge society' is lauded as an opportunity for progress for all. It is a notion that lacks due regard for the inherent costs as well as the benefits of a global knowledge society and economy. Van Zupthen (2005) (cited in Eriksson *et al.* 2005 p1) describes the new economic paradigms as focused on innovation that is based on knowledge scarcity and that has changed the fundamentals of the overall economic system. In the new paradigms it is owning knowledge properties and controlling rights that constitute the means of controlling the economical systems of today's societies. Addo (2001, p146) sees a power struggle at play in relation to knowledge ownership which is leading to economic development and technology control that is enhancing both knowledge and development. Spring (2008, p334) observes that in the global flow of information there can be a subjugation of some forms of knowledge to other forms. Stambach & Maleka (2006, p333) concur on the hierarchical disposition of the global knowledge society, which while premised on ideals of equity more often involves the 'unfettered movement of capital, technology, ideas or people' in a one-way trans-national flow towards the dominant knowledge-based economy and society hubs.

The intrinsic tension between the use of knowledge as a commodity for capital gain and as a public good for the development of society can result in increased social inequalities and divisions both within society and between societies – in particular between societies from the developed and developing worlds. A 2007 report by the United Nations Conference on Trade and Development (UNCTAD) stresses that Least Developed Countries (LDCs) will be increasingly marginalized if they do not enhance the knowledge content of their economies and achieve economic diversification through learning and innovation (UNCTAD 2007, p6). Addo (2001 p144) suggests that the disparities between the nations of the developed and

developing worlds have 'been noted to a large extent to be a function of technology' leading to what is commonly described as a *digital divide* between and within both worlds. Several studies refer to a digital divide fault-line as indicative of a growing number of ever deepening global divides – from an *education divide*, to a *science divide*, to a *culture divide* leading ultimately to a *knowledge divide* (UNESCO, 2005 p160)*.*

It is to recognize that in parallel with the ascendancy of knowledge production as a critical commodity in the global sphere of competition and production, the centrality of learning has emerged as a core component of modern development. What will matter most in the new knowledge-based societies and economies is 'learning how to learn' where learning, knowledge production through problem solving, on-going skills acquisition and development of distributed leadership skills and capacity will be seen as part of a total life experience of the new 'knowledge workers' and 'knowledge citizens'. It is a concept of learning that expands beyond the boundaries of the education industry as we know it to encapsulate a concept of lifelong learning for professional preparedness, development and research (Faure *et al.* 1972) (cited in Seldon & Cairns 2002, p 7) (Coolahan 2002, p13) .

The knowledge society and economy, the knowledge and technology divides, the global migration and brain drain (or brain circulation as it is referred to in some circles), have all become part of global and regional discourses, processes and institutions affecting educational practices and policies (Spring 2008, p330). There are major international intergovernmental and nongovernmental organizations contributing to this intertwined knowledge society, technology and education discourse – agencies such as the World Bank, the Organization for Economic Cooperation and Development (OECD), the World Trade Organization (WTO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and International Nongovernmental Organizations (INGOs) associated with human rights, environmental, gender and technology education.

As one of the intergovernmental agency contributors, UNESCO argues that progression to Knowledge Societies from Information Societies requires that 'the use of Information and Communication Technologies (ICTs) must be linked to the recognition that knowledge is the principal force of the social, political, cultural and institutional dimensions of development, founded on human rights' (UNESCO 2005, p2). The focus on human rights places human development as the 'objective' and economic growth as the 'means' by which the former is

achieved. This is to recognize that the analysis of knowledge societies cannot be the exclusive preserve of economic analysis (Mansell 2010, p30). It is to emphasize that knowledge societies are about the variety and plurality of the world's knowledges and more especially they are about building "capabilities to identify, produce, transform, disseminate and use information to build and apply knowledge for human development" (op.cit., p. 5).

As one of the INGO contributors to this discourse, GeSCI holds as its central mission and goal the concept of Knowledge Building and Sharing: to contribute to *Knowledge Societies for All* by assisting education systems at national, regional and continent–wide levels to integrate and use ICTs effectively to spur socio-economic development.

In Africa GeSCI joins with several regional partner organizations to assist African countries develop various elements of the Knowledge Society. The multi-lateral agencies such as the World Bank and the African Development Bank (AfDB) provide broad support to all elements with a focus on socio-economic development and poverty reduction. The United Nations Economic Commission for Africa (UNECA) has focused on developing National ICT Policies and Strategies and on building capacity and raising awareness of African leaders on Science Technology and Innovation (STI). Others, like the International Telecommunications Union (ITU) have focused on assisting countries develop the ICT infrastructure and systems as the critical infrastructure to support knowledge creation and sharing at the national, regional and global levels.

GeSCI will complement the roles of these partners and specifically that of the AUC and UNECA by focusing on building capacity and raising the awareness of African leaders and policy makers on the role and contribution of ICTs for education, learning and skills development to the development of Knowledge Societies in Africa. Because of the close inter-relationship of these elements, GeSCI will collaborate with the AUC, UNECA and other partners including the private sector and civil society in ensuring integrated visioning, policy making, strategic planning and capacity building to realize the African vision for the Knowledge Society and Knowledge Economy as a vehicle for poverty reduction in African countries. Within this collaboration GeSCI will focus on ICTs' contribution to Knowledge Societies and build the absorptive capacities of current and potential future African leaders (policy and decision makers, implementers and practitioners) to acquire, assimilate, transform and exploit the benefits of ICT and knowledge to produce a dynamic

organizational capability through peer knowledge sharing and collaboration and exposure to technology (GeSCI 2010a, p7).

In the following section the challenges for building African Leadership capacity for ICT in Education are presented. The section examines the technological core that is at the heart of educational provision and the implications this has for improving organizational capability in education systems to stimulate innovation and contribute to the development of Knowledge Societies.

2. The Knowledge Economy Pillars of Education, Technology and Innovation and their Implications for the Technological Core of the 'Grammar of Schooling'

More and more countries across the globe are embracing a vision for Knowledge Societies and to further this future agenda, they are investing as never before in development towards Knowledge Economies. In their ground breaking survey on ICT in Education in Africa, Farrell and Isaacs (2007, p5) report a growing recognition by governments of the role of ICT for future socio-economic development 'as evidenced by the number of countries that have a national policy for ICT in place or under development'. In a new survey carried out by GeSCI on the Knowledge Society in Africa (GeSCI, African Knowledge Society Database, 2010b), there are many new additions in the evidence of country national policies, planning and strategy developments for building Knowledge and Information Societies. For example Algeria is defining the elements of an *Algerian National Information Society Strategy* to create multi-sectoral synergies in the areas of infrastructure, training, and research as well as information systems and ICTs (Government of Algeria, 2009). Madagascar presents a *Bold And Exciting Plan For Rapid Development*, which provides a set of eight commitments relating to the economic and social upliftment of the Malagasy society inclusive of 'responsible governance', 'connected infrastructure' and 'educational transformation' (Government of Madagascar 2007). The presence of national ICT and innovation policies and strategies act as a catalyst for developing new multi-sectoral approaches and plans for education renewal and socio-economic development.

In relation to measuring progress on policy and planning operationalization, the World Bank Institute has developed a Knowledge Economy Framework as a benchmarking tool to enable

countries to examine their global ranking on the knowledge ladder. The tool presents four interconnected pillars for assessing progress, namely a) the economic and institutional environment for enabling use of existing and new knowledge, b) the level of education and skills of the population to create, share and use knowledge, c) the information and communication technology infrastructure to facilitate communication, dissemination and processing of information, and d) the efficiency of innovation systems of firms, research centres, universities, and organizations to tap into the global knowledge stock, to assimilate and adapt it to local needs and to create new knowledge (World Bank, 2007 p8). Dahlman (2007, p10) notes that while developing countries have been improving their relative position in the global ranking scale in the past decade, most developing countries particularly in sub-Saharan Africa continue to rank at the lowest measure.

There is a move towards a paradigm shift in the Africa discourse of engagement with the Knowledge Society and Knowledge Economy. In 2007 a first continent wide African Knowledge Economy Forum was held on the theme of *Utilizing Knowledge for Development* bringing together African high ranking policymakers, representatives from academia, the private sector and civil society. The forum defined a 'new approach' for knowledge use to development that incorporates three pillars of Education, ICTs and Innovation. The forum considered the three pillars as critical to building enabling environments conducive to knowledge use for development in Africa.

Education as the first pillar is a *sine qua non* for preparing citizenry for the Knowledge Economy and Knowledge Society. The key to sustained economic growth and poverty reduction is the development of a flexible and skilled workforce (Kozma 2009, p6). The key to keeping pace with the constantly changing global job market and technology is life-long learning. Preparation for lifelong learning requires an emphasis in primary and secondary schools on learning general skills and competencies, in particular communication, mathematics and science skills, problem-solving, interpersonal skills, as well as skills needed to learn other subjects (Spring, 2008 p339). At tertiary level the requirement is for building capacity in science and technology skills, research and development. Developing capacity in science and technology is regarded as key to enabling diversification of a developing country's economic base, to increasing opportunities for economic growth and to improving people's lives in aspects such as food security, health, energy, clean water and sanitation.(Nampota *et al.*2009, p59). Education contributes to all the other sectors by

providing the required skills and know-how for economic development (Pulkkinen, 2010). It is thus that access to an inclusive high-quality education by all – regardless of gender, ethnicity, religion, or language – can multiply the benefits for individual, business, private and public enterprise and lead to economic growth that is equitably distributed and enjoyed by all (UNESCO 2008, p7).

ICT as the second pillar is fast becoming a critical tool for preparing and educating students with the required skills for the global workplace. In this regard, technology plays a double role to both educate students so that they can continually adapt to a work world of continuous technological innovations (World Bank, 2003) (cited in Spring 2008, p337) and to make it easier for students to access the world's knowledges (Stromquist, 2002) (cited in ibid.). ICT can make the education system more relevant and responsive to society's needs. They can contribute to the development of other important Knowledge Economy and "new millennium" skills such as critical thinking, information retrieval, analytical capacity, problem solving, communication and ability to understand and manipulate new media (GeSCI 2010b, p8). ICT is also perceived as having great potential to aid the effort in spreading education in the developing world and in improving it through better teacher training, raising skill levels and building and sharing knowledge (Unwin 2004, p152). ICT opens up possibilities for more active and social pedagogies, for access to more global knowledge resources, to a wider diversity of cultures, to greater flexibility in learning and enhanced engagement, to knowledge sharing and refinement of teaching resources through communities of educators and trainers, to more scope for formative assessment, and various forms of online communication including peer-to-peer interactions. In essence ICT can be an effective vehicle for bridging educational and knowledge divides and the wider global digital gap (Aczel *et al*. 2008, p500). They represent engines for growth and tools for empowerment and they have profound implications for education change and socio-economic development (UNESCO, 2008 p7).

Innovation as the third pillar is seen as the 'life-blood' of development and economic functioning (Westera 2004, p507). It is described as a process of creation, exchange, evolution and application of knowledge to produce new goods. Innovation is fundamentally about risk taking where "unplanned opportunities and previously unexpected linkages and synergies are to be expected" (World Bank 2007 p10). Innovation is not just about pushing back the frontiers of global knowledge, but also about first use of existing knowledge in the

local domestic setting (Dahlman 2007, p11). Innovation to adapt, adopt or use knowledge to produce new goods and services in local contexts or to advance society in general is the product of a well developed higher education and research sector working closely in tandem with the private sector. Markkula & Sinko (2008, p1) believe that there are important technological, pedagogical and social innovations which should be elaborated in order to harness innovation systems to foster creativity in tackling the challenges of reorganising economies and social orders. Open Innovation is the driver of change integrating tertiary level research, teaching, learning and different collaborative multidimensional developments. This requires that governments and political leaders understand the link between ICT, quality Education, Science and Technology, Innovation and development and that they draw up strategies to encourage and sustain this link (GeSCI 2010b, p8).

The Africa Knowledge Economy forum (2007) noted that investment in the first two pillars of ICT and Education over the past ten years has yielded limited successes with overall results disappointing for replication and up-scaling. The focus would now be on Innovation and a systems approach to development for addressing some of the intractable issues and challenges of educational provision to serve societal goals for a Knowledge Economy and Society.

The unrealized promise of ICT to transform educational provision has been reported in numerous studies. In a meta-review research on ICT in Education commissioned by GeSCI in 2009, LeBaron and McDonough note that when technology is simply layered onto a traditional framework of educational delivery, its potential is severely constrained (LeBaron and McDonough 2009, p9). The authors relate several metaphors for transformational resistance in education systems inclusive of the 'grammar of schooling' (Arbelaiz and Gorospe 2009, p51) to describe entrenched practices. A World Bank study (2003) on the challenges for developing countries to provide adequate education and training structures for the global knowledge economy, identifies the inadequacy of the traditional 'grammar of schooling' model in the observation that:

> *...a knowledge-based economy relies primarily on the use of ideas rather than physical abilities and on the application of technology. . . . equipping people to deal with these demands requires a new model of education and training (p. xvii).*

In their analysis of human capacity development in Malawi for leveraging technology and science for socio-economic development, Nampota *et al.* (2009) identify the 'nature' and

'quality' of the traditional 'grammar of schooling' model as fundamental to the challenge for changed practices:

> The ''nature'' issue concerns the curriculum. A more ''relevant'' curriculum, as opposed to ''academic science'' with its heavy reliance on imported equipment and glassware, could be a realistic way forward…The second issue concerns the quality of teaching. On the one hand, there is concern regarding the numbers of qualified school teachers, particularly science teachers… On the other hand, the pedagogic strategies used by school teachers are problematic (pp67 – 68).

Markkula & Sinko (2008, p1) maintain that 'taking off from traditional thinking' is essential for equipping emerging knowledge economies with the mastery of systemic innovation. Educational leadership in both developed and developing worlds is thus challenged to examine the larger structure and vision for knowledge use for development before considering particulars of technology integration for improvement of educational provision.

Metz (2009 p4) traces the 'grammar of schooling' structure to Tyack's *One Best System* (Tyack 1974) (cited in ibid.) based on early models for mass industrialized production that appeared at the dawn of the twentieth century. The 'grammar of schooling' represents a factory model of school organization for the mass production of educated citizenry that is deeply engrained in the social conscious as the accepted way of 'doing schooling'. The author ascribes the factory model syntax with its standardized curriculum and pedagogy as the 'Real School', whose deviation would risk sub-standards and raise suspicion.

LeBaron and McDonough (2009, p38) report on several studies describing the potential of technology for 'disrupting' the grammar of schooling. However technology will offer nothing more than a superficial window dressing that is 'masquerading as innovation' if the curriculum and pedagogy that is at the heart of the 'nature' and 'quality' of the traditional schooling grammar is not disrupted and reformed. For policy makers and educational leaders, such disruption may be prove uncomfortable and problematic due to strong vested interest groups intent on blocking reform. Effective leadership needs to accept the discomfort and push the boundaries of the technological core of the schooling grammar in order to produce authentically beneficial change. A key recommendation in the eLearning Africa Ministerial Round Table 2010 was the requirement for a distributed inclusive leadership throughout the system – a leadership that will "embrace disruption because without some degree of disruption change is not possible" (ELA, The Lusaka Communiqué, 2010, p11).

Metz (2009, p8) suggests that the expectations of political and business leaders of the twenty-first century Knowledge Economy have not altered much from their predecessors in the twentieth century Industrial Economy. The dominance of the well-worn factory model has survived various attempts at reform from 'progressivism' to 'constructivism'. The model continues intact, with a renewed focus on outcomes and accountability. The twentieth century factory metaphors have merely transitioned into the twenty-first business metaphors in a policy thrust towards franchised "replication" of models of schooling that can be "scaled up" for national application through policy and practice (ibid., p19).

Sachs (2008, p195) relates the "terrors of perfomativity" that the Knowledge Society engenders as a central tenet of its replication and standardization agendas. The obsession with performativity as a policy device presents a major paradox in current applications of ICT policy in education systems - inhibiting the 'risk taking' that is required to disrupt the 'grammar of schooling' and release the transformation effects of technology for promoting authentic learning and innovation.

Metz (2009) considers Perrow's organizational analysis developed in the 1960s to be of crucial relevance in the standards vis-a-vis innovation debate of educational provision and school reform. His analysis examines the technological core of two extremes of educational function and their implications for educational leadership and management. At one extreme where the work process (traditional pedagogy) is well understood and the raw material (traditional curriculum) is standard it is possible to standardize performance and outcomes and manage the process remotely. At the other extreme where the work process (new pedagogy) is not well understood and the raw material (technology infused curriculum) is non-standard, then it is very difficult to standardize performance and outcomes in which case:

> *…the workers must be allowed considerable discretion, to adjust to variations in the raw material and they must be highly skilled and knowledgeable so that they can draw from broad and deep funds of both collective wisdom and individual experience in making judgments about how to do the work. Hierarchies should be flat with workers having considerable autonomy and opportunity for collegial consultation and supervisors should work with smaller groups, a narrow span of control in a more consultative relationship. (Perrow 1960) (cited in Metz, 2009 p13)*

LeBaron and McDonough (2009, p10) note that in the context of restructuring schooling for a new grammatical syntax in the education arena, the literature urges that educational leadership assure the provision of adequate support and resources so that educators may pursue the experimentation and risk taking necessary for innovation in sensible and safe settings. Markkula & Sinko (2008, p5) would suggest that creating such conditions can enable the schooling work culture to detach from traditional function-based management and move towards collaboration, co-operation and co-creation with shared parallel processes. The authors emphasize the need for work place learning that capitalizes on the expanded new literacies of Knowledge Society concepts for promoting innovative milieus, creative tension and community networks.

The final section of this paper examines structural strategies for ensuring safe settings for management of educational change. The focus is on structures to promote leadership capabilities for restructuring the grammatical syntax for ICT use in educational settings in a manner which can promote innovative and transformational practices.

3. Creating Structures for Promoting Capabilities and Fostering Educational Innovation toward the Development of Knowledge Societies for All

In order to realize the vision of the Knowledge Economy and Knowledge Society, the role of leadership & management is critical to changing the 'grammar of schooling' which has inhibited a paradigm shift for knowledge building, utilization and creation in development. Levin (2006, p42) contends that breaking through the implementation barrier is probably the most difficult challenge for educational leadership. LeBaron and McDonough (2009, p38) stress the critical role of leadership at the local level to address both the curricular and social dimensions of educational change, as well as the critical necessity for deep continuing communication among all levels of the policy jurisdiction. Younie (2006, p385) agrees on the tenuous connections between policy and practice implementation resulting from systemic failure to grasp the complexity of the implementation challenge from the micro-level of locally-administered school pilot projects, to the 'meso' level of technical support, to the 'macro' level of policy upscaling and large scale collaboration.

In Perrow's (1965, p914) organizational analysis, the introduction of new techniques or innovations into systems requires that institutions draw upon the existing knowledge available within society. The complexity of the innovation techniques to be introduced will affect the structural arrangements necessary to achieve organizational goals and to ensure their implementation and institutionalization at different system levels. Fullan (2007, p18) points out the requirement for coordinated whole-system, sustainable, tri-level reform; 'at the local school and community level as one of the "tri's", at the district level as the mid "tri", and at the state or national level as the final "tri"'.

Metz (2009, p9) bemoans the current dominant model for promoting educational change and improvement with its focus on achievement, accountability, and evidence-based research, while ignoring the environmental effects of policy change on the internal norms, values, tacit knowledge and culture of the educational setting. Robertson (2008, p284) concurs on the limitations of the dominant model of change management and its proliferation of an instrumentalist literature offering 'how-to-advice' and multiple lists of research findings which smack of a technological determinism, and which fail to acknowledge the complexity of human behavior dynamics in the change process. Tham & Werner (2005) (cited in Salmon 2005, p205) record that the focus on the technological solution and top-down policy is both detrimental for the human dimension consideration and for the 'scaling-up and embedding of innovation and the associated management of change'.

Robertson (2008, p284) would suggest that the general nature of the change approach should vary depending on the size of the institution and the scope of change required. Salmon (2005) describes two approaches to change management for introducing ICT in tertiary institutions encompassing large-scale centralised change and incremental change. The author has devised a four quadrant strategic framework to support institutional e-learning and pedagogical innovation that is based on Ansoff's (1965) matrix for growth and expansion. Salmon's approach builds on institutional core capacities and tacit knowledge through an incremental introduction of technology and pedagogical innovation that can be understood at a variety of system levels and that can offer opportunities and a safe setting for experimentation and risk taking for those who wish to explore it.

The Salmon matrix is utilized here to examine international, regional and national capacity building models that were presented in eLearning Africa 2010. The models were developed

to support e-Learning and Innovation programmes and initiatives in Public Sector services delivery sectors in development contexts. The matrix in Figure 1 presents a summary of the content and pedagogical approaches extracted from three models that were presented in the conference (Jagannathan *et al.* 2010, p189) (Makuni 2010, p193) (Shoukry 2010, p197).[1]

The models were designed to improve the capacity of policy makers and practitioners to evaluate and reform educational, environmental, and tourism systems among others, to increase collaboration between professionals within and between public sectors, to strengthen policy and practice, to improve communication between networks and to provide support for reform implementation and identification of needs at various system levels.

The models were developed using a blended suite of interactive courses that mixed e-learning activities with face-to-face workshops. The focus was to enable action-based learning that is *just-in-time* and related to work based practices and issues.

The underlying pedagogical approaches presented in the models incorporate key elements from Salmon's two pronged approach for large scale and incremental change towards expansive learning and innovation, which can be summarized as follows:

- Quadrants one, two and three in Figure 1 represent modular content for building stakeholder core technologies and practices through incremental stages of capacity building and new technology integration.
- Quadrants one and two suggest modular content for building knowledge on the basis of institutional key strengths and work processes with adjustments for applying and reflecting on new techniques and their application in real world scenarios for public sector service delivery.
- Quadrant three suggests modular content for engaging stakeholders in knowledge exchange with an expanded community of peers and experts on the use of new techniques to address issues and solve problems in different contexts at national, regional and local levels of public sector service delivery.

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[1] Innovations in the Education Sector: Sustainable eLearning Solutions, Sheila Jagannathan, Michelle D. Kalinski, James Gresham and Caludine Bourrel, The World Bank Institute, USA
Towards an Improved Public Service Delivery through Knowledge Management in Zambia, Milner M. Makuni, Ministry of Tourism, Environment and Natural Resources, Zambia
Using eLearning to Promote Regional Capacity Building and Regional Integration , Sherin Shoukry, COMESA, Zambia

- Quadrant four represents the more radical view of change which integrates action research and development to explore the use of new techniques in work practices for knowledge utilization, adaptation, adoption, and creation towards improving and transforming public sector service provision.

Leadership and management ICT and Innovation in Education		
Existing	New	
Virtual learning environments, multi-media content, e-libraries and text based resources to introduce new techniques for improving established work processes in the public sector	Interactive simulations, problem solving exercises, case studies to reflect on and explore wider pedagogical applications for new techniques in a number of real-world public sector scenarios	Existing
Peer and expert collaboration to explore use of new techniques for relevance & application to public sector policy and practices at different system levels from national, to regional to local context	Research and exploration of new techniques, emerging technologies and applications for knowledge utilization and creation towards innovation and transformation of public service systems	New

Quadrant 1 *Quadrant 2* *Quadrant 3* *Quadrant 4*

Sources: Ansoff 1965; Salmon, 2005; Makuni, 2010; Shoukry, 2010; Jagannathan *et al.* 2010

Figure 1. The e-learning and pedagogical strategic framework for building public sector capacity towards expansive learning and transformation of service provision

Concepts, processes and environments building the foundation for deeper collaboration are the prerequisites for innovativeness. The matrix presents a model, a structure and a conceptual framework in which policy makers and practitioners are enabled through capacity building and exploration of new techniques to mobilize their core technologies into a broader constituency for expansive learning and innovative practices. In such an environment the technology core of the traditional framework of service delivery is safe as is the technological opportunity to take risks within a safe setting for more radical approaches. In theory at least the model is thus adequate to challenges for building capacity within complex environments. In practice some would claim that many public sector institutions are devoid of the trust and collegiality necessary for expansive learning (Sachs, 2008 p199). This would present a problem for the sustainability of the change and innovations derived from capacity building programmes.

Conclusions

In this paper three management change themes were examined in relation to GeSCI's regional programme collaboration for building capacity and raising awareness of African

Leaders in ICT (ALICT) on the issues of the Knowledge Society and its pillars of ICT, Education and Innovation for social and economic development. The themes were explored on the basis of perspectives for understanding management change issues in relation to national and institutional goals, technology and structures. Old and new institutional theoretical constructs were explored to understand the complexity of the change environment and derive a model for supporting leadership and management for ICT use in the education sector in the developing world. The central challenge identified lies in shaking off the traditional thinking and shaking the schooling grammar syntax as a necessary step for equipping the emerging knowledge economies and societies with the mastery of systemic innovation.

GeSCI will initiate work in the ALICT programme with a critical activity to define the learning needs and capacity gaps of African Leaders in ICTs and the Knowledge Society. The identification of the needs will be the basis for designing, developing, testing and implementing appropriate capacity building and knowledge-diffusion models. The hope is that a model is developed that may bring value to African Leaders for addressing the challenges of development towards Knowledge Societies for All in Africa.

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