Key Success Factors for Developing e-Skills in a Developing Country: South African Case Study

Zoran Mitrovic
University of Western Cape, South Africa

zmitrovic@uwc.ac.za

Wallace Taylor
The Information Society Institute, South Africa

wallace.j.taylor@gmail.com

Mymoena Sharif
iKamva National e-Skills Institute, South Africa

mymoena1101@gmail.com

Abstract

The establishment and development of the Internet and other Information and Communication Technologies (ICT) in recent decades, enabled by increasing capacity, mobility, accessibility affordability and "vision based" applications of ICT, represent the material foundation for the networked society. This is often referred to as "Information Society" and/or "Knowledge Economies". However, the creation of such a technology-supported society that holds the promise of being increasingly self-reliant and equitable, involves fundamentally new ways of thinking, working and living. It requires the building of new capacities, particularly those related to the effective appropriation of ICT, not only in the work force but across the dynamic of the entire population and specifically including the low socio-economic groups. These capacities have often been referred to as "e-skills", "e-literacy" or "e-competences". They are deemed as indispensable in addressing important social issues such as poverty and unemployment, the safety of citizens and in building an inclusive and capable developmental state. Recent research in South Africa confirms that building these skills and competencies in the context of a developing country (and the developmental state) require careful planning and execution Crucially it depends on inter alia : (i) a systemic, multi-stakeholder, collaborative and aggregated approach, (ii) the creation of an influential and credible e-skills ecosystem, (iii) the development of an appropriate e-skills taxonomy, (iii) the astute use of ICT and e-skills/e-competences (e-Astuteness and e-Social Astuteness) and (iv) meaningfully supporting national socio-economic developmental strategies and agendas. It is envisaged that this report will benefit practitioners (principally government planners) in developing, particularly African, countries as well as researchers willing to advance this work.

Keywords: Knowledge Society, ICT, e-Skills, e-Competences, Critical Success Factors, Developing Country, Africa.

This paper accepted and published after external peer-review

Introduction

The rapid pace of development and institutionalising of modern information and communication technologies (ICT) across society in recent decades is by many seen as a technological foundation for advancement of so called Information Society and Knowledge economies. This development, which variously affects corporate sector, public organisations and entire societies, demands new set of skills associated with fundamentally new ways of thinking, working and living in this technology supported and networked world. Hence, it is not surprising that the skills and competences required by such a society are often concomitant with the use of modern ICT devices and programmes and are often referred to as e-skills or e-competences (EESF, 2004; NeSPA 2010; SFIA, 2012). In general, these skills and competences involve the ability to develop and use ICT to successfully participate in an ICT supported networked environment dominated by access to digitally enabled information coupled with an ability to synthesize available information into effective and relevant knowledge.

However, it seems that very fast technological development creates e-skills capacity shortages in both developing and developed worlds. For example, it is reported that Europe's growing e-skills shortage is affecting the productivity and the competitiveness of large and small organizations across society (eSEW, 2010; eSN, 2010). The situation in South Africa is not much better, causing South Africa (SA) to slip down the international 'e-readiness' rankings - it is estimated that South Africa continually experiences a shortage of over 70,000 IT professionals (ITWeb, 2008). As reported recently, the shortage of e-skills is even more perturbing since the supply of ICT graduates in many countries is now showing a decline (Birchwood Declaration, 2007; Accenture, 2008; NeSPA, 2013). In short, , many African and other developing countries are experiencing a very short supply of people possessing required e-skills capacity - be it for either equitable prosperity opportunities within a country or global competitiveness of their economies.

One of the main challenges that developing countries face in skilling their citizens for equal prosperity and global competitiveness lies in fact that obtaining appropriate e-skills is not a once-off event since fast paced technological changes require continuous upgrade of these skills. Despite the fact that some developed countries (e.g., UK, EU states) are successfully addressing e-skills agenda, it is apparent from many interventions that the solutions for these countries cannot be easily replicated in the developing world. For example, ICT skills and competences related frameworks such as the UK Skills for Information Age (SFIA, 2012) or the European Union (EU) European e-Competency Framework (EeCF, 2013) largely revolve around so called "practitioners" (or professional) e-skills and e-competences. Unlike developing world, these countries do not have the urgent need to address, huge social and economic disparities, massive illiteracy, or considerable 'digital divide', which become apparent through inequitable access to and ineffective use of the contemporary ICT. Thus, overcoming these serious problems requires a different, significantly proactive and innovative effort as large portions of the population in developing countries will require effective e-skills for sustainable socio-economic growth and development.

In the context of the developmental state, which implies a wider involvement of government, our study is based on the premises that: (i) the United Nations (UN, 2005) call for "*socially inclusive governance for the information society*". This includes a new paradigm focused on human development and socially and digitally inclusive developmental strategies, that involves an inclusive mode of governance where all citizens of a will have equal access developmental opportunities and (ii) one of the key challenges in effecting e-government identified in developing countries is the low level of ICT literacy and skills amongst the potential users of e-government approaches (Khan et al., 2010). In the same manner, Sahraoui (2007) suggests that the effective adoption of e-government is not possible without digital inclusion (e-inclusion). It is self-evident that neither e-inclusion nor e-government would be possible without e-skilled and e-competent people.

This paper outlines a case study from South Africa that can also be relevant to other African or other developing countries worldwide. Using the case study methodology (Le Compte & Preissle, 1993, p. 39), we apply a "*thick description*" (Merriam, 1991, p. 11) to describe a systemic and systematic approach to e-skilling in South Africa by answering the questions: (i) why an e-skilling agenda in South Africa was needed, (ii) what approach was used to address this agenda and (iii) what were the key success factors for this endeavour.

The South African approach to e-skilling is thus far unparalleled, so it was not possible to find comparable examples from other countries reported in the modern literature. Thus, this paper is based on more than three years of experience with a national approach to e-skilling in South Africa. We believe that this report has relevance for academics, practitioners and policy-makers in the field of e-skills delivery. The approach described here has particularly relevance for developing countries and will add to the reported literature and thereby provide input for a collective approach to advance research and practice in this arena.

This paper now proceeds with the background to the approach to e-skills development in South Africa and is followed by a description of that approach with the focus on the key success factors. The article ends with a conclusion section that outlines the main points of this study, limitations and suggestions for further research.

Background

The establishment of the e-skills agenda in the developmental state of South Africa was based on a number of suppositions including the recognised importance of ICT for building Information Society and Knowledge Economy for a more equitable prosperity and global competitiveness, the fact that the country has considerable shortage of e-skilled (an e-astute) people, the recognised need for these kinds of skills to address the country's major socio-economic issues and the country's dramatically declining position in the global e-readiness rankings (GITR, 2013; NeSPA, 2010, 2013). In order to tackle these problems, the SA government has thus far taken a number of actions such as establishing an e-skills institute (now launched as the iKamva National e-Skills Institute - iNeSI), organizing two national e-skills summits in 2010 and 2013 and in developing two national e-skills Plans of Action (NeSPA, 2010, 2013).

The primary focus of iNeSI was (and still is) to be a catalytic leader, coordinator and aggregator of effort in order to engage a wide base of various stakeholders to develop a collaborative and integrated national policy, which would guide further action in e-skilling the nation for more equitable prosperity and global competitiveness. In that regard the iNeSI collaborates with all government departments on the national level as well as with businesses, education, civil society and organised labour.

The First e-Skills Summit (Cape Town, June 2010) which brought together more than 300 local and international delegates, concluded that the e-skilling in South Africa could not be successful within the old paradigm involving only input (e.g., required resources) and output (e.g., number of e-skilled people). Hence, the delegates recognised that 'copy' from other countries (particularly developed) and 'paste' to South Africa (or other developing countries) was not an effective approach. The Summit discussions recognised that a new paradigm, which requires a shift in emphasis from 'inputs and outputs' to impact was needed. An approach using 'collaborative network architecture' through a coordinated effort to shift past 'doing to' and/or 'doing for' towards 'doing with' was needed at the local level. This required the use of existing resources across all stakeholders as well as individual stakeholder inputs and rights. It was believed that this approach could bridge the operational and structural gaps between the stakeholder groups (business, gov-

ernment, education, civil society, organized labour) at local, provincial, national and international levels, thereby providing a sustainable national structure (Mitrovic at al., 2012).

The Second e-Skills Summit (Cape Town, October 2012), jointly held by the iNeSI and the International Telecommunication Union's (ITU) Global ICT Forum on Human Capital Development concluded that that a major e-skilling agenda in South Africa should make a 'profound difference' in people's lives by addressing poverty, developing an active citizenry that was capable of contributing to 'people centred development' and establishing a capable and developmental state. It was also concluded that so called 'core' e-skilling (i.e., skilling people for using hardware, software and networks), although necessary, was not sufficient to address triple crisis of poverty, unemployment and inequality. The delegates also concluded that the rate of ICT evolution was often outstripping the capacity of Government, Education and Business to adequately equip society within nation states; hence a multi-stakeholders approach was necessary for an effective e-skilling in the developing countries (ITU-Summit, 2012). Both e-Skills Summits resulted in the development of National e-Skills Plans of Action (NeSPA, 2010, 2013). These stressed the point that the multi-stakeholder collaborative approach and linking e-skills agenda to the national development strategies and plans was the key to successful skilling the nation for equitable opportunities and global competitiveness (NeSPA, 2010).

These plans provided clear directions for actions at national, provincial and local community levels. However, these high level key success factors were not sufficient by themselves to explain all of the important concepts that were required for e-skills success in the context of developing country. Hence, the next section, in portrays the elements that appeared to be key success factors for effective e-skilling in the context of a developmental agenda.

E-Skilling Success Factors

E-Skills Definition and NeSPA Taxonomy

Firstly, the iNeSI definition of e-skills was based on the WSIS (2003) and European e-skills Forum (EESF, 2004) and refers to the ability to develop and use ICTs within the context of a knowledge environment and associated competencies that enable the individual to participate in a world in which ICT is a requirement for advancement in business, government and civil society (Wesso, 2008). Initially, the e-Skills Institute adopted a taxonomy that described four types of e-skills:

- *ICT practitioner skills*: the capabilities required for researching, developing, designing, managing, producing, consulting, marketing, selling, integrating, installing, administrating, maintaining, supporting and servicing ICT systems.

- *ICT user skills*: the capabilities required for the effective application of ICT systems and devices by the individual.

- *e-Business skills*: the capabilities needed to exploit opportunities provided by ICT - to explore possibilities for new ways of conducting business and organizational processes, and to establish new businesses.

- *e-Literacy*: the capabilities needed to socially appropriate ICT for local development (Wesso, 2008).

However, the First e-Skills Summit (2010) delegates believed that this taxonomy was limiting in a South African context. Following an extensive discussion in the dedicated working groups and subsequent plenary debate, a new e-skills classification was suggested as follows:

- *e-Literacy Skills*: aimed at employment readiness, particularly targeting unemployed and unskilled youth and rural society (including starting own small business);

- *e-Participation and e-Democracy Skills*: focusing on enhancing citizen interactive engagement with communities, local, provincial and national governance processes to increase participation, self-reliance and equity;

- *e-Government/Governance Skills*: focusing on increasing efficiency and productivity interactive bimodal approaches to service delivery of governments and its agencies across all ICT platforms including new cell phone technology, community radio, and the like;

- *e-Business Skills*: aimed at increasing organizational efficiency and productivity;

- *e-User Skills*: focusing on enhancing the efficiency of public and private sector knowledge workers;

- *e-Practitioner Skills*: aimed at enhancing the capacity of public and private sectors to manage, support and service ICT; and

- *e-Community Skills***:** aimed at increasing self-reliance, participation and community support in a socio-economic setting to build social cohesion in ways that can better build local solutions to societal matters such as crime, health, education and the like (NeSPA, 2010).

Key Success Factors for Delivering the e-Skills Agenda

Achieving e-skills goals, as defined in NeSPA (2010) was not an isolated process but was tightly linked to the peak national development policies, such as the Medium Term Strategic Framework (MTSF) 2009-14, National Development Plan (NDP), or internationally accepted obligations, such as the attainment of Millennium Development Goals (MDGs) and the World Summit on the Information Society (WSIS) plan of action. Bearing the requirements in mind, the Summit delegates identified nine key issues for the development of an e-skills action agenda for South Africa. These issues were considered as the key success factors in e-skilling:

- Affordable access to ICT;

- Collaborative approach across existing effort and gaps to action the e-Skills agenda;

- Action within 'A Path to Impact' based approach to enhance the delivery of established policies and programs and build new approaches;

- Cooperative network architecture based on nodes at local level;

- The need for a comprehensive research program that will inform policy development, practice, service delivery and (lifelong) education;

- Focus needs to include support for small, micro, and medium enterprises (SMMEs)

- Focus on the national development programmes and agendas;

- Effective use of existing resources;

- Starting the delivery of NeSPA with a few overarching projects.

Affordable access to ICT

In South Africa, there is recognition that access to affordable and effective ICT is a basic human right. It is believed that, alongside access to water, electricity, transport, food security and right to work, the lack of access to these technologies will rapidly increase inequity (thus negatively im-

pact on social cohesion), reduce effective health care, increase crime, and reduce life opportunities, particularly for the people in poor communities. This affordable access to ICT for all citizens is also a key prerequisite for the sustainable development of e-skills in South Africa. The ubiquitous access to ICT is also seen as the contributing factor towards achieving National Equity Goals (reducing impact of class, race, gender, age, disability, and HIV/AIDS) set out in the National Skills Development Strategy 2011/12 – 2015/16 (NSDS, 2010). As pointed out by the delegates at the e-Skills Summit and stated in NeSPA (2010), delivering equitable access to both ICT and technology based services through a transfer pricing mechanism such as already applies to water and electricity should bring a compelling value proposition, through increased applicability and affordable cost, to all South African people (Mitrovic et al, 2012).

Collaborative approach, "path to impact", and cooperative network architecture

According to Taylor (2004), the collaborative approach starts with developing a base for a collaborative model across government, business and education which in turn provides the basis for policy development, collaborative research across the broad base of e-skills, and promoting public discourse around such matters. This collaborative approach focused on practical, applied, policy relevant research was likely to have a greater impact on policy and practice through supporting coordinated bodies of work, rather than a scatter of atomised, free-standing projects. It will also provide the base for managing risk of (unproductive) dominance of one the involved sectors (business, government or education) over a broad societally relevant agenda of e-skills development.

The main idea behind new, collaborative model for addressing e-skills shortage in South Africa is to overcome the 'silo' approach of government departments, education, business and civil society by harnessing existing and developing knowledge and skills evidently available in educational institutions, corporate businesses, and across the government – not just in South Africa but also internationally. The main purpose of this collaborative model was being to effectively support the processes of e-skilling the nation for the Information Society and creative knowledge economies. These processes would be facilitated by the South African government through than e-Skills Institute (e-SI), now re-launched as iKamva National e-Skills Institute (iNeSI). This collaborative initiative was developed in order to support activities of the institute in the following way (Mitrovic, 2009):

- To establish an independent governance structure, e-skills agenda & delivery capability;

- To achieve its key political and policy imperative of delivering to the country sufficient e-skilled workers (10,000 skilled workers in a immediate future);

- To assist e-SI to obtain national and internationally recognised stature and build further impact;

- To assist in securing a strategic output (research and development) implemented at low cost but high impact that informs three key areas: (i) the capacity of the network, (ii) the capability of the network to deliver network driven e-skills development, and (iii) a medium to long-term analysis of the targets and achievements of the e-SI.

In this regard, the proposed collaborative model needed to be capable of establishing national and international collaborative networks of a diverse stakeholders (e.g., universities, corporate and government based researchers and policy-makers) committed to contributing independent intellectual capital and policy advice on options for implementation and evaluation of e-skills strategies to the e-SI and other stakeholder groups.

On the other hand, involving citizens in the e-skills collaborative agenda helps faster 'buy-in' by potential beneficiaries, decentralisation of e-skills policies and greater citizen participation in the government affairs – regarding preparation the citizenry for the Information Society and Knowledge economies. This policy decentralisation was not new to Africa as, for example, Ghana used such a decentralised approach for government and its services from 1988. As Misuraca (2007) points out, an important aspect of the implementation of decentralised policies for government emphasised the specific role given to civil society organisations, the private sector, as well as traditional authorities, to collaborate in the development of partnership and participate in decentralised multi-partnership efforts.

The values of the collaborative efforts aimed at the capacity building (e-skills in this case) are now well recognised not only in South Africa but in other African countries and-Pan-African organisations. For example, the government of the Republic of Uganda recognised the important role of ICT and developing e-skills for national development through its ICT Policy framework (2002) that strongly advises "*enhancing collaboration and co-ordination in ICTs development at the local, regional and international level*" (UICT, 2003). Furthermore, it is recognised that the effectiveness of the African Information Society Initiative (AISI) depends upon successful skills development, i.e. capacity building and the identification of potential areas for collaboration among stakeholders (ECA, 2008).

The South African e-skills collaborative approach is depicted in Figure 1. This approach involves stakeholder collaboration (across government, business, education and civil society) apply research results within appropriate collaborative network architecture. It is believed that this approach can secure not only output and outcome but wider societal impact in South Africa (NeSPA, 2010).
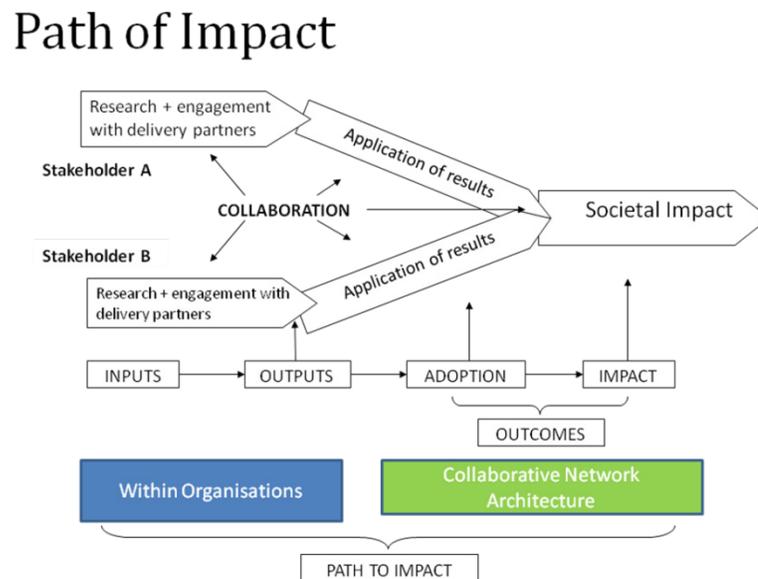

Figure 1: Path to e-Skills Impact (Source*:* NeSPA, 2010)

Despite the aspirations of a number of recent national efforts to address collective national problems through existing delivery channels at national level, the fact remains that, in the absence of a collaborative network architecture that can legitimize development, impact achievement has been less than expected. Since, as deemed by the e-Skills Summit 2010 delegates, socio-economic impact is primarily local and then national, addressing the profound issues that South Africa faces, an appropriate developmental dynamic can only be found in changing the prevailing paradigm:

from "doing to" and "doing for" to "doing with". Such an approach is depicted diagrammatically in Figure 2.
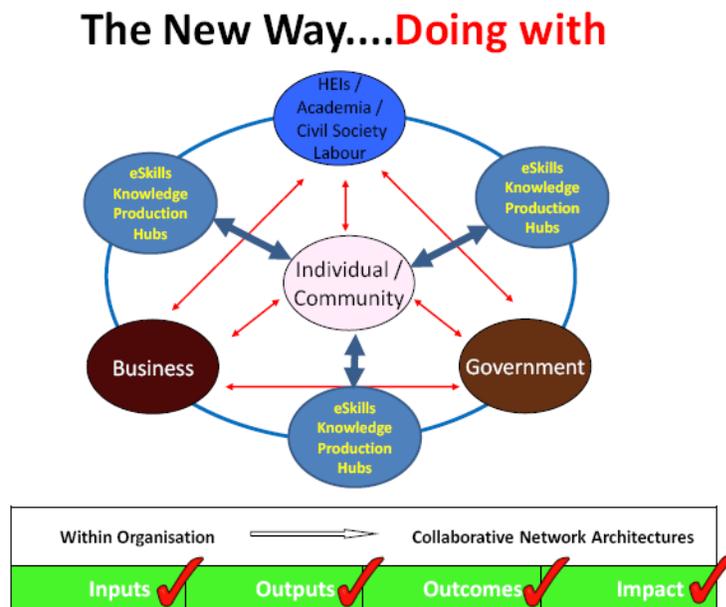
Figure 2: "Doing With" (Source*:* NeSPA, 2010)

Comprehensive research programme

Since a large number of e-skills research initiatives were in progress across a range of agencies in Government, Business, Education and Civil Society in South Africa in 2010, it was recognised that a process to group these into aligned activities was required to examine possible overlap and to identify gaps. It was suggested that future e-skills related efforts (delivery and research) needed to be categorised into theme areas that could allow appropriate assessment of needs, determine relevance to the national e-skills agenda and the goals of the appropriate strategic plans (e.g. MTSF, NDP etc.), identify the relevant discipline bases that could support them and to determine the specific needs of key stakeholder groups. The delegates of the First e-Skills Summit (2010) agreed that the starting point for this should include the following themes: (i) benchmarking and progress of the current e-skills situation in South Africa, (ii) state of the infrastructure and access to ICT and e-skills, including convergence, new models of access for underserved communities, (iii) ICT and e-skills in education, including the alignment of current and future pedagogy, (iv) ICT and e-skills in business, including both synchronous and asynchronous use of converging technologies in bimodal service delivery and (v) ICT and e-skills in the community context, including the use of social media in meeting the needs of the population (NeSPA, 2010).

Due to the particular socio-economic situation of South Africa (a mixed mode economy which is reflective of the needs of many developmental states), programme delivery and research in the e-Skills arena is a complex endeavour. Hence, it should encompass a multi-factored approach that recognises the dimensions of a developmental state and their interactions with a rapidly evolving set of converging technologies.

At the same time, it was realised that in South Africa that these emerging technologies especially cell phone adoption, have already demonstrated rapid uptake in low socio-economic collectives that have very poorly developed capacities to appropriate these technologies to improve individuals life chances and deliver more equitable outcomes at the community level. This prompted the

national e-skills institute to propose prioritising the following areas for e-skills research: (i) more equitable access model to ICT infrastructure, (ii) compare e-skilling needs of the served communities i.e. potential demand with the e-skills supply in order to identify a 'skills gap', (iii) e-skills curriculum development, and (iv) alignment of e-skills initiative with the national development strategies and agendas. It was also proposed that the e-skills related research should involve all relevant multi-disciplinary stakeholders including inter alia academia, social scientists, educationalists, business, civil society, labour, donor agencies and countries and all three spheres (national, provincial and local), branches and departments of government.

An assessment of e-skills research was delegated to the South African Research Network for e-Skills (ResNeS), which was established in 2011. This body has established the criteria for measuring effectiveness of e-skills research, i.e. the key success factors related to the impact of the e-skills related research in terms of the objectives of the national e-skills agenda, which is articulated in two national e-skills plans of action (NeSPA, 2010, 2013). These factors include (i) measurable and specific targets/milestones, (ii) inclusivity in the e-skills policy development processes, (iii) monitoring (audit) the number of people being skilled (in the government, business, education and civil society as well as the ICT sector), (iv) the effectiveness of training programmes, which includes the 'Training the Trainers' programmes, the growth in jobs, the effectiveness of service delivery, the competitiveness of business sectors, the impact on social cohesion and the changes in attitude of being skilled , (v) an annual audit on key ICT statistics, (vi) online availability of education curriculum, (vii) tracking the movement of ICT professionals, key service delivery professionals and educators/trainers across the sectors and the associated migrant flow in and out of the country, and (viii) set and validate e-skills standards, which will help in achieving an international recognition of offered qualifications.

Focus on SMMEs and the national developmental agendas

In many countries, small, medium and micro enterprises (SMMEs) are regarded as 'engines of growth'. In South Africa there are about 2.5 million SMMEs, including many in the informal sector. These enterprises constitute up to 95% of South African businesses. Further, it is estimated that this sector has doubled in size over the since the early 2000's, growing at about 7% annually (Branam, 2008) and that SMMEs account for 99.3% of all privately owned enterprise in South Africa (DTPS, 2014). Hence, the sector's current and potential contribution to economic growth and employment places a very high significance on e-skills capacity development for SMME sustainability and growth has (Mitrovic et al., 2012).

There are numerous studies which suggest there are significant opportunities to increase SMME efficiency by leveraging ICT. However, there are also challenges faced by SMMEs in South Africa and Africa that affect the capacity of SMMEs to obtain substantial benefit from appropriating modern ICT devices and applications and these need to be addressed. These challenges inter alia include (i) high cost of Internet access (particularly in previously disadvantaged and rural areas), (ii) lack of integration and coordination of support for small business, (iii) variable service delivery quality, which lowers ability to compete with larger enterprises, (iv) late payment patterns by government, increasing financial pressure, and (v) traditional challenges with monitoring and evaluating SMME sector.

As many of these problems can be addressed by effective appropriation and use of modern ICT devices and applications, the immediate task for e-skills capacity development in the SMME sector is to significantly increase the limited ICT literacy (e-literacy) and e-astuteness across the country. Increasing the general level of e-literacy within SMMEs can increase efficiency and profitability, whilst increasing the general level of e-literacy and e-astuteness amongst youth, disadvantaged and rural communities will lead to more micro-enterprise development and opportu-

nities to develop a more collaborative and integrated mind-set. This is essential to attract appropriate investment, build an increasing self-reliance and embed innovation and responsiveness (NeSPA, 2010).

The e-skills capacity development in the SMME sector (and also entire population for Information Society) cannot happen in isolation – it needs to be approached within the context of building an inclusive developmental economy in South Africa and similar developing countries. As stated in NeSPA 2010, the challenge set out in the national developmental agendas is to find ways to deliver e-skills capacity (e-astuteness) to communities so that they have a visible impact on the national goals and then to monitor the process in ways that inform continuing effort within the context of a developmental state.

Effectively use existing resources

One of the key priorities which emerged from the e-Skills Summit 2010 was the need for the co-ordination of existing e-skills capacity and resources to maximize impact, reduce duplication of effort, and act as a focal point for the development of measureable e-skills competencies. Consequently, one of NESPA 2010 objectives was to build a committed national approach for e-skills priorities through coordinated collaboration with key stakeholders (government, businesses, education, civil society, organized labour) in ways that allow their contribution of existing human, technical and financial resources in mutually beneficial ways. It was proposed that this could be achieved through formalised network architecture of cooperation between these stakeholders. This formalised approach which would recognise and valorise individual agency value propositions would provide a means to optimise resource utilisation in order to effectively implement policies, plans and programs for economic development. The more than 300 thought leaders who attended the Summit and who laid out the key components of the NeSPA 2010 believed that without this formal coordination architecture there was a very high probability of continuing failure and significant waste of resources. In this sense it is useful contemplate the falling position of South Africa in the global e-readiness rankings.

Start with a few overarching projects

There was a very clear message from the e-Skills Summit 2010 and the consultation process that led to the Summit that the implementation of the National e-Skills Plan of Action should start with a small number of overarching project/programs that would provide a platform for subsequent action. In this context, the following criteria should be considered (NeSPA, 2010): (i) project's leveraging capability in terms of making use of the existing projects that could incorporate the e-skills capacity development agenda, existing working environment and existing facilities and resources, (ii) projects that were capable of accelerating the e-skills agenda in South Africa, (iii) projects that could capitalise on a broadband capacity in South Africa, (iv) in order to achieve the necessary enthusiasm for e-skills development amongst all stakeholders, the showpiece projects should have a priority; and (v) from a policy development perspective, projects that could utilise the past research and already formulated policies should have precedence.

Introducing "smart" e-Skills: e-Astuteness and e-Social astuteness

The 2nd e-Skills Summit (Cape Town, October 2012), jointly held with the International Telecommunication Union's (ITU) Global ICT Forum on Human Capital Development, provided the e-SI and various e-skills stakeholders (business, government, education, organised labour, civil society organisations) and the international partners (e.g. UNDP, ITU, CISCO) with the opportunity to "take stock" of what had been achieved in the previous two years and also to forge the way forward for e-skilling the South African nation. More than 350 national and international delegates agreed that a major e-skilling agenda in South Africa was required to make a 'profound

difference' in people's lives: to address poverty, to develop an active citizenry that was capable of contributing to "people centred development" and establishing a capable and developmental state.

The Summit reinforced the reality that 'traditional core' e-skills capacity development, i.e. skilling people for using ICT (hardware, software, networks), although necessary, was not sufficient to improve inequity and to build an inclusive economy that could sustain itself in a world increasingly dominated by pervasive ICT which increasingly embedded new, unavoidable technological applications including social media. This almost inevitably meant that the 'smart' countries were getting 'smarter' and the developing countries were being left further behind despite the reality that most of the recent innovations in ICT (including capacity, mobility, accessibility and cost) had the capability to provide greater advantage to developing countries (ITU-Summit, 2012). Hence, a new approach to 'e-skills capacity development' was needed to achieve a positive impact on meeting the goals and aspirations of South Africa's strategic plans (NeSPA, 2013).

Mitra (2005, 2006, 2012) has demonstrated the power of learning networks (peer-to-peer) and self-organising systems in the adoption of ICT devices for local benefit in low socio-economic situations. Hence, it was concluded that some social and 'developed intuition' related skills ('soft' skills) needed to be included in the e-skills capacity development agenda, if the majority of citizens were to successfully apply e-skills in their everyday lives: be it for economic (e.g. employment readiness or starting and running an own business), service delivery, education and training or social (e.g., building more cohesive and safer communities) purposes (NeSPA, 2013). Hence, the National e-Skills Institute introduced a concept of 'astute' use of e-skills for personal growth and self-reliance (*e-Astuteness*) into its strategic plans the Second e-Skills Summit (ITU-Summit, 2012). The concept of e-astuteness is not confined to the formally educated but encompassed developed and existing capability across the full spectrum of society that would allow individuals and collectives (business, education, social and family) to harness ICT for individual or group benefit.

The concept of e-Astuteness is directly based on the notion of astuteness, which is by various dictionaries define as "*the acute, keen intellect*" (The Funk & Wagnalls Dictionary, 1943), "*having or showing a clever or shrewd mind*" (Webster's online dictionary, 2005) or "*clever; keen, acute, bright; shrewd; perceptive*" (Oxford Babilon Dictionary, 2012). Conceptually, e-Astuteness is "*a dependent construct that is based on personal and interpersonal skills of individuals and is reliant on building a knowledgeable capacity and creating a mind-set that embraces all forms of technology and prepares users for future forms of technology and their possible socio-economic applications*" (Mitrovic et al., 2013). It is believed that e-astuteness can help individuals (i) to understand people (local cultures) and situations better, (ii) to build beneficial alignment and alliances (networks – local, national and international – personal, learning, business and services) and (iii) towards better understanding of the current strategic socio-economic and technological directions within local applicability. Furthermore, the concept of e-Astuteness assumes that individuals should possess certain e-skills so that they can apply both operational and strategic behaviour in the use of modern ICT for achieving individual socio-economic benefits. In practice e-astuteness may result in quite simple applications (so-called 'apps'), which can deliver relatively small individual benefits at the outset. However, the concept of 'scale' ('economies of scale') across cultures, socio-economic circumstance, profitability and alike is fundamental to the power of modern ICT to shift value propositions (Mitrovic et al., 2013).

If e-astuteness is used in the social context it 'becomes' e-Social Astuteness, a construct that can be viewed as the use of ICT and e-skills for more astute ways of people interacting with others for a collective socio-economic benefit. This is related to a process of (i) involvement in a network of social interactions, (ii) having a collective level of awareness and understanding diverse social situations, (iii) the identification of socio-economic needs and opportunities that could be met with ICT enabled applications, (iv) the examination of various alternatives, (v) the development,

testing and modification of options, (vi) the assessment of 'fit' of value proposition i.e. success or failure and applicability and (vii) network supported adoption and scaling (Mitrovic et al., 2013). The concept of e-Social Astuteness is also a dependent construct and is primarily built on e-Astuteness but applied in a networked community socio-economic context. Hence, developed e-Social Astuteness can be used, together with the acquired e-skills, for more astute ways for socially interacting with other community members.

There are numerous advantages of community based capacitation of e-Astuteness and e-Social Astuteness in everyday life in a wide range of socio-economic contexts but particularly in developing countries where there are wide ranges in literacy, inequity, language, culture, dependency and alike, be it in economic or social contexts.

Conclusion

E-Skills capacity development in a societal sense is a diverse, broad and pervasive matter involving multiple stakeholders across business, education, civil society and government. It involves legitimate activity at a host of levels from peer-to-peer at the personal level through the hierarchies of society across all the stakeholder categories. Hence delivering a societal e-skills capacity development approach aimed at preparing a Nation to be better respond to the challenging Information Society and the emerging Creative Knowledge Societies cannot be easily met by relying solely on a traditional scientific approach to research, policy development, service delivery and evaluation. Often such approaches rely upon a concept of subsequent general societal 'diffusion' (passive) and not on a concept of 'adoption' (proactive). Adoption is fundamental to preparing society to meet both the challenges of inequity and the opportunities of 'inclusion' in the emerging ICT driven age. Nor can addressing the gaps be effectively dealt with through traditional methods of formal education, training and marketing. E-skills as defined in the South African context are not always visible, do not always provide an immediate tangible benefit and are not always easily described or measured. Hence, the approaches which are well suited to tangible products, direct measurement and immediate benefit are insufficient by themselves to address the immediate needs of South Africa in preparing itself to maximise the obtainable benefits of increasingly pervasive modern ICT devices and applications which are increasingly suited (mobility, accessibility, affordability, vision enhanced) to developmental states. Further, the multiplicity of sectoral effort, which understandably services secular interests, is uncoordinated and does not provide an adequate base for synergy for effective service delivery, engagement or policy development. Up until recently, the focus on 'access' has dominated this space, but convergence in technological capacity (e.g. cell phones) and reducing capital and operating costs, now shifts the emphasis to 'effective use' and social appropriation. These matters are the next looming barrier to equity, self-reliance, participation, government service delivery, improving life chances and in dealing with every one of the major societal matters that South Africa faces. The fact that South Africa - and many other developing countries in Africa and worldwide - faces the problem of massive under development in e-skills capacity development makes these points self-evident.

Addressing these matters in a substantive manner requires a collaborative, integrated, embedded, strongly supported and inclusive approach to research, evaluation and policy development.

Future Research Directions

Clearly what is now required is a strong research agenda that supports the concepts of the 'quadruple helix' (government, business, education and civil society) approaches to addressing complex problems. At this point in time traditional discipline based research lacks the coordination mechanisms that can deliver visible and tangible results against impact on societal goals. The GITR (the networked e-readiness index which underpins the annual Global IT Report by WEF

and INSEAD) makes a sound start by proposing a set of components or variables that can be aggregated into a concept of e-readiness.

However, developing a coherent and integrated approach to addressing components that fall below comparable levels yet needs to be appropriately developed. Further, whilst macro-economic approaches have identified some links between the adoption of ICT and the Gross Domestic Products (GDP), there needs to be a lot more effort applied to defining component contribution to national strategic goals that can better interpret the impact of interventions such as e-skills capacity development. In times of increasing austerity by governments, particularly as far as education and research are concerned, there needs to be a lot more emphasis on providing the architecture that can bring the components together in coherent and beneficial manner to demonstrate impact. At the local level, there are a host of socio-cultural matters which impact the rate of effective appropriation of modern ICT devices and application for local individual and collective community benefit. It is more than obvious that traditional techno-deterministic, socio-economic, government service delivery and financial business models do not adequately address real and emerging value propositions that are now becoming more visible as ICT applications develop and cause substantive paradigm shifts. Whilst a number of large research funders are beginning to grapple with these matters with in a developed economy context, the transfer of such approaches to developing economies has yet to find continued success.

References

Accenture. (2008). *The ICT skills landscape of South Africa: A viewpoint on demand, supply and applicable international benchmarks.* Prepared by Accenture for the South African e‑Skills Working Group, August 2008

Birchwood Declaration. (2007). *Tertiary level ICT skills development.* Retrieved on 2 June 2008, from www.cs.ru.ac.za/ ICTSkills/Declaration%20ICT-Skills%202007.pdf

Branam, C. (2008). The South African small business environment. *Occasional Paper.* 25July 2008.

DTPS. (2014). *The request for information: ICT SMMEs. Notice 596 OF 2014.* Department of Telecommunications and Postal Services, Republic of South Africa.

ECA. (2008). The African Information Society Initiative (AISI): A decade's perspective. *Economic Commission for Africa. Addis Ababa. Ethiopia.*

EESF. (2004). The European e-skills forum e-skills for Europe: towards 2010 and beyond. *The European e-skills forum, Synthesis Report,* September 2004.

EeCF. (2013). European e-Competence Framework 3. Available at http://relaunch.ecompetences.eu/wp-content/uploads/2014/02/European-e-Competence-Framework-3.0_CEN_CWA_16234-1_2014.pdf

eSEW. (2010). *e-Skills: European Week 2010 underlines e-skills' potential to help Europe's economic recovery.* Brussels*, 2010.* Retrieved on 2 February2010 from: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/220&format=HTML&aged=0&language=EN&guiLanguage=en.

eSN. (2010).The e-skills Manifesto - Employers call for action on e-skills. *e-Skills News.* Retrieved on 01 Mar 2010 from http://www.e-skills.com/news-and-events/2010/the-e-skills-manifesto---employers-call-for-action-on-e-skills/

GITR. (2013). The global information technology report 2013. *INSEAD & the World Economic Forum. Eds. Bilbao-Osorio, B., Dutta, S. & Lanvin, B. World Economic Forum, Geneva.*

ITU-Summit. (2012). *2nd e-Skills Summit and the International Telecommunication Union (ITU) Global ICT Forum on Human Capital Development Summit Conclusions Report.* Cape Town 22-25 October 2013. Unpublished.

ITWeb. (2008). *ITWeb -JCSE ICT skills survey.* Released in September 2008 on a DVD as a Power Point presentation with accompanying audio.

Khan, G. F., Moon, J., Rhee, C., & Jae Jeung Rho, J. J. (2010). E-government skills identification and development: Toward a staged-based user-centric approach for developing countries. *Asia Pacific Journal of Information Systems, 20*(1)*,* March.

Le Compte, M. D., & Preissle, J. (1993). *Ethnography and qualitative design in educational research.* (2nd, Ed.). New York: Academic Press.

Merriam, S. B. (1991). *Case study research in education: A qualitative approach*. San Francisco Jossey-Bass.

Misuraca, G. C. (2007). *e-Governance in Africa: From theory to action. A handbook on ICTs for local governance.* Asmara, Eritrea: Africa World Press.

Mitra, S. (2005). Self organizing systems for mass computer literacy: Findings from the 'hole in the wall' experiments. *International Journal of Development Issues, 4*(1), 71-81.

Mitra, S. (2006). *The hole in the wall: Self-organising systems in education*. New Delhi & New York: Tata-McGraw-Hill Pub.

Mitra, S. (2012). *Beyond the hole in the wall: Discover the power of self-organised learning.* TED Books.

Mitrovic, Z. (2009). *Funding e-skills research in South Africa*. Working paper. The Information Society Institute (TISI) for the Department of Communications for the Department of Communications. South Africa.

Mitrovic, Z., Sharif, M., Taylor, W., & Wesso, H. (2012). Systemic approach to e-skilling in South Africa. *Issues in Informing Science and Information Technology*, Volume 9, 2012.

Mitrovic, Z., Taylor, W. Sharif, M., Claassen, W. & Wesso, H. (2013). e-Social Astuteness skills for ICT-supported equitable prosperity and a capable developmental state in South Africa. *International Journal of Education and Development using ICT, 9*(3), December.

NeSPA. (2010). *The National e-Skills Plan of Action* (NeSPA, 2010). The Department of Communication, South Africa*.* Retieved on 24 October 2010*,* from www.doc.gov.za.

NeSPA. (2013). National e-Skills Plan of Action (NeSPA 2013): *Continuing e-Skilling the Nation for Equitable Prosperity and Global Competitiveness*. Pretoria: Department of Communications: e-Skills Institute. Retrieved on 12 December 2013 from: www.doc.gov.za/documents-publications/category/14-e-skills-documents.html.

NSDS. (2010). *Framework for the National Skills Development Strategy 2011/12 – 2015/16*. 29th APRIL 2010. Department of Higher Education, South Africa.

SFIA. (2012). Skills *Framework for the Information Age: Framework reference SFIA version 5*. SFIA Foundation, London. Available at: www.sfia-online.org/framework/english/.

Sahraoui, S. (2007). E-inclusion as a further stage of e-government? *Transforming Government: People, Process and Policy, 1*(1), 2007*.*

Taylor, W. (2004). Building smart communities for the information age. *Putting People at the Centre of the Information Society (PPACIS). COIN Internet Academy, Central Queensland University*.

UICT. (2003). *National information and communication technology policy*. *Uganda ICTs Policy framework*. Retrieved on 12 October 20013 from: www.researchictafrica.net/countries/uganda/2003_Uganda_National_ICT_Policy_Framework.doc

UN. (2005). *Global e-government readiness report 2005: From e-government to e-inclusion*. New York: United Nations.

Wesso, H. (2008). *e-Skills: Building the information society and knowledge economy*. Work in progress, Dr Harold M Wesso, Acting CEO: Meraka e-Skills Institute, Department of Communications, 30 January 2008. Retrieved on15 February 2009 from: http://196.30.226.221/events/ictskills/presentation/harold_wesso.pps.

Biographies

Dr Zoran Mitrovic is the Coordinator of the Masters in Information Management Programme at the University of the Western Cape, South Africa. He is the leading author of the South African National e-Skills Plans of Action (NeSPA 2010 and NeSPA 2013). His research and consulting praxis encompasses the development of e-skills in the developmental context, the use of ICT for local socio-economic development, e-government policies and praxis, and the ICT-supported open government. He works with all spheres of government and international organizations such as UNDP.
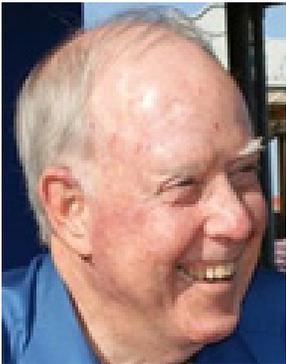
Prof Wallace Taylor is the founding director of The Information Society Institute (TISI), which is currently engaged with the South African Department of Communications e-Skills Institute in addressing national and international issues involved in the social appropriation of ICT for local socio-economic benefits. Prof Taylor is also Honorary Professor the University of the West Indies. His current research and praxis interests are focussed on the social appropriation of ICT, public policy development, the role of higher education in the information society and building self-reliance for civil society inclusion. Prof Taylor was named as Citizen of the Year by the City of Rockhampton (Australia) in 2001 for his contribution to community development, the initiation of a range of community and industry events, organisations and programmes. He is co-author of the South African National e-Skills Plans of Action (NeSPA 2010 and NeSPA 2013).

Mymoena Sharif is the Chief Director of the Department of Communications iKamva National e-Skills Institute, a South African government initiative to advance and implement key e-skills interventions. She is a member of the Strategic Council for the United Nations Global Alliance on ICT for Development and is a former winner of the Bill & Melinda Gates International Access to Learning Award. She is co-author of the South African National e-Skills Plans of Action (NeSPA 2010 and NeSPA 2013).