PSIPSE Regional Themes and Challenges:
The Use of Technology in Teacher Development in East Africa

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The **Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE)** aims to accelerate innovation in secondary education programming, research, and development. It is led by a group of private donors and donor advisors, including Central Square Foundation, ELMA Philanthropies, Human Dignity Foundation, Intel Foundation, the John D. and Catherine T. MacArthur Foundation, Marshall Family Foundation, MasterCard Foundation, and an anonymous donor. Project durations are one to three years, and are located across East Africa (encompassing Kenya, Tanzania, and Uganda), India, and Nigeria. Results for Development has been selected as learning partner, and will work with three local learning partners to monitor the funded projects, draw out and share important learnings from the efforts, and use these learnings to inform future programming.

Center for Social Sector Education and Policy Analysis (CSSEPA) is a public interest development organization founded in 2011 and specializing mainly in capacity development, project evaluations, policy reviews, action research, monitoring service delivery and reforms. CSSEPA serves as the East Africa local learning partner for PSIPSE.

Introduction

This paper explores the use of technology to promote teacher development for effective secondary education in East Africa. We examine relevant programs supported by the Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE), with a focus on approaches and challenges in addressing issues revolving around technology in education. This paper draws on broad experiences with the PSIPSE grantees in the East Africa sub-region as well as CSSEPA's larger knowledge base on technology and education in East Africa.

Challenges, Issues and Successes in ICT Programs for Teacher Development

The biggest challenge for teacher development in information communications and technology (ICT) is providing teachers with the necessary knowledge, skills and understanding to successfully integrate ICT into meaningful educational practices and experiences. This paper views ICT development as a three-pronged process that takes teachers and students through: 1) learning about ICT, 2) learning with ICT and 3) learning through the use of ICT. These technologies should be used as an effective means to support new ways curriculum delivery, not simply as an educational 'extra'. Teacher development should, however, maintain a balance between developing effective teaching and learning strategies and increasing the knowledge and skills of teachers through and in the use of ICT. Other challenges revolve around ICT literacy and integration.[1]

These competencies, once achieved and contextualised, create new learning environments in which learners take decisions about their own learning while teachers facilitate the process. ICT integration into curriculum delivery requires understanding from the teacher and requires some changes in classroom practices. It is a multi-dimensional concept that requires a wide base of understanding and an exploration of the many opportunities that ICT offers. It requires creativity and imagination from both teachers and learners, with the former believing that the latter can also contribute to the learning experience. Inevitably, this will change the way that teaching and learning take place and the way they are organised and managed. It can offer flexible-learning contexts in terms of how, when and where learning takes place. This can have and have had impact on the way our schools are managed and administered. ICTs have far too often been interpreted merely in the very restricted notion of the use of computers and the internet for teacher training, rather than in the wider sense of the technologies used to deliver a diversity of learning solutions.[2]

Furthermore, as with many other educational ICT initiatives in Africa, the focus of most programmes remains primarily on the importance of giving pupils and teachers ICT skills, rather than on using ICT to enhance their wider learning experiences. Most initiatives aim to connect teachers and learners to the internet, but without comprehensive frameworks developed at national level to train teachers in the appropriate use of new technologies.

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[1] Literacy connotes interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate and evaluate information, construct new knowledge and communicate with each other in order to participate effectively in education and school programmes. On the other hand, integration is about the appropriate selection, use, mix, fusion and integration of many sets of competencies including, but not exclusively, those in pedagogy and technology.

[2] According to Partnership for 21st Century Skills and the Programme for International Student Assessment, 2009.

Another challenge has to do with the 'computer tragedy': computer laboratories in schools and higher education institutions stand idle for much of the time, piles of old or broken hardware accumulate in dusty corners, and very often one can find computers that have rarely if ever actually been used hidden under plastic covers.[3] This is a wasteful, because new technologies can have a tremendously positive influence on learning attainment and education practice if they are appropriately managed and used. Perhaps even more significant is that most computers in education institutions in Africa have little if any educational software installed on them, or on the servers to which they are networked.

Other challenges facing these ICT-based and innovative teacher training models include inadequate funding for technology, infrastructure and training activities, thus explaining the limited scope of implementation of the initiatives. Many programs have limited capacity in project management, monitoring and evaluation that are essential for sustainability purposes.

Asante Africa Foundation's teacher training.
http://www.asanteafrica.org/asante-africa-with-khan-academy/

Some of the success stories in East Africa are programmes implemented by the **Global eSchools and Communities Initiative (GESCI)**. These programs include Advancing Leadership in ICT and Knowledge Society Development across Africa and Strengthening Innovation and Practice in Secondary Education through innovative Use of Technology to Deliver and Enrich Teaching and Learning in Secondary Schools in Kenya and Tanzania.[4] Other successful examples are in Tanzania where **Asante Africa Foundation** is scaling up an integrated, student-centered educational model to elevate quality of education from rote memorization to one that fosters analytical and cognitive skills in an ICT-driven and integrative teacher training for secondary educators project, in collaboration with Mwenge University College of Education (MWUCE). Another program by **Sazani Associates** focuses on promoting healthy and sustainable schools in Tanzania by replicating and scaling up a previous project to deliver Sazani's model of innovative education, service delivery and skills development for secondary school teachers in Zanzibar.[5] All three organisations are supported by the Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE). One other example of a major player promoting ICT education in secondary schools in East Africa (Kenya and

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[3] As viewed by the Information and Communication Technology in Education Working Group of UNESCO; 2009.
[4] This programme is an African Union Commission initiative supported by Ministry of Foreign Affairs of Finland and implemented by GESCI (which was founded by the UN ICT Task Force, for more details consult www.gesci.org).
[5] These are projects under the Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE) in East Africa being implemented nine partners across Kenya, Uganda and Tanzania with technical support from Results for Development Institute (R4D) and CSSEPA (Centre for Social Sector, Education and Policy Analysis).

Uganda) is **Windle Trust**,[6] who believe ICT has a major role to play in providing the platform for skills enhancement. Their efforts are aimed at the expansion of ICT penetration to improve livelihoods, with ICT skills being used as a stepping stone in acquiring higher level skills and increasing the employability of youth.

The ongoing teacher training programmes by PSIPSE projects organizations are aimed at building teacher competencies in child-centered pedagogy and use of new technologies to improve student engagement and learning outcomes, particularly among vulnerable children. Ultimately these initiatives will enhance learner transition to and retention in secondary education in addition to imparting skills that are relevant to societal life and labor markets. Unless ICT becomes part of both the delivery and content of education, both as an enabler to the learner and a value addition to the learning process, it will not serve as a bridge meant to facilitate the digital divide.

Approaches to Teacher Development in ICT

The holistic approach to teacher development has three dimensions:[7]

- Pedagogical dimensions, which imply understanding and application of the opportunities in use of ICT for teaching and learning in a local curriculum context
- Technical dimensions, which imply an ability to select, use and support a range of ICT resources as an appropriate means to enhance personal and professional effectiveness; and the willingness to update skills and knowledge in the light of new developments
- Networking dimensions, which include critical understanding of the added value of learning networks and collaboration within and between partners, and the ability to create and participate in communities of practice

Any approach must emphasize six fundamental principles of good practice for ICT programmes to be effective:

- A shift from an emphasis on education for ICT to the use of ICT for education
- An integration of ICT practice within the whole curriculum
- A need for integration between pre-service and in-service teacher training
- A need for the development of relevant and locally produced content
- A need for appropriate educational partnerships
- An emphasis on the development of sustainable costing models

For education to reap the full benefits of ICTs in teaching and learning, it is essential that pre-service and in-service teachers have basic ICT skills and competences. Such arguments build on the increasingly widely accepted principles of the Society for Information Technology and Teacher Education that:

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[6] For example, Windle Trust with support from EU under SERD (support to education for refugees in Dadaab) consortium is working to improve ICT literacy for over 2,060 secondary and post-secondary students (520 girls and 1,540 boys) in and around the Dadaab camps of Northern Kenya.
[7] Adapted from the European Union's T3 Core Curriculum for Telematics in Teacher Training.

- Technology should be infused into the entire teacher education programme
- Technology should be introduced in context
- Students should experience innovation in technology-supported learning environments

Training of effective teachers remains a critical and effective strategy in providing quality education. However, regional education systems have not been able to reform teacher education programmes. Available information indicates that development organizations like Sazani Associates and Asante Foundation in Tanzania are responding to teacher training gaps by working with stakeholders to influence teacher education so as to bring about desirable learner outcomes. Some of these initiatives involve scaling-up successful models that involve child-centered learning techniques or environments using local, community-based and school-based workshops for secondary school teachers. In collaboration with local education officers and heads of schools, and with the endorsement of the Ministry of Education, teachers are exposed to a series of activities through which they learn the use of participatory, student-centered methods required by national syllabi. Other strides that have been made by East African States include development of gender responsive curriculum that encourages learning by both girls and boys in a non-discriminatory way.

Most of the PSIPSE projects are using teacher training institutions as vehicles for testing, refining and scaling up innovative training models. One of the strengths of this initiative is that upon validating the potential impact of these models, civil society groups, donor agencies, UN bodies, private sector and relevant public institutions will establish collaborative and accountable links across multiple actors that bring expertise, skill, and insight to sustainable and culturally appropriate methods.

The Role of Policymakers and Other Organizations in Advancing or Scaling Up ICT for Teacher Development

Policymakers must provide strategic leadership for any ICT for teacher training programme to be successful. Such programmes need to be owned and led at all levels by the government and the Ministry of Education. Ownership and stakeholder participation in development of coherent strategies and implementation plans is equally important, and it is crucial that the process of developing such strategies must involve all relevant stakeholders and partners at all stages. All three East African governments examined in this paper (Kenya, Tanzania and Uganda) have developed and are now implementing national integrated ICT policies and strategies with a focus on the level of enabling environments and infrastructure provision (which varies enormously across East Africa). While good broadband connectivity is now taken for granted in many of the richer countries of the world and educational software is increasingly being developed to take advantage of this, such access to the internet is still rare and expensive in East Africa.

Despite a plethora of state and non-state initiatives around ICTs and education, there remains considerable misunderstanding across the sub-region about the real potential of ICTs to transform the processes of learning. State-led campaigns have the potential to contribute effectively to the development of ICT strategies for teacher development as they can help communities grasp the significance of the transformations possible. Lastly,

policymakers must take the lead in designing and coordinating implementation of innovative teacher training programmes across pre- and in-service curricula.

Governments and stakeholders in the East Africa are recognizing that the impact of teachers is the crucial variable for improving learning outcomes (UNESCO 2005). They must therefore appreciate that the way teachers teach is of critical concern in any reform designed to improve quality. It is critical and strategic to note that the ongoing teacher training initiatives under PSIPSE are involving relevant government ministries and are working closely with other relevant stakeholders. On their part, governments have committed to review policies that will create more widely accessible, relevant, and higher quality secondary education.

Conclusions and Recommendations

Variability in infrastructure provision means that blended solutions for the use of ICT in teacher development will need to be thought through carefully in specific national contexts. A comprehensive teacher training programme will thus make optimal blended use of print, audio/radio, video, television, computers, the internet, peer-group face-to-face contact, and more traditional forms of classroom based learning if they are to be successful. All the three countries already have an existing network of teacher training colleges in place, and given limited connectivity and resources, it may often be most logical for the provision of computers and the use of the internet for teacher training in these institutions, with subsequent links being established to other educational institutions.[8]

There is urgent need to shift from 'Education for ICT' to the use of 'ICT for Education.' To date, almost all initiatives that aim to use computers and the internet in schools have focused initially on giving people ICT skills, in the expectation that once they have these they will be able to access a wealth of information that will be of use to them. However, information is not the same as knowledge, and mere access to information is not what education should be about. Even some of the best initiatives, such as those developed by World Links[9] and the Commonwealth of Learning[10] have a tendency to focus primarily on ensuring that teachers have ICT-skills rather than on the deeper processes associated with how the benefits of ICT can be used in facilitating effective teaching and learning.[11] The key message that needs to be understood is that using ICT *for* teacher development and in education more widely is not about presenting existing educational content (e.g. books or posters) in a new way, but rather about enhancing the processes through which both teachers and pupils learn.

It is crucial for ICTs, including print media, audio, video, computers and the internet, to be integrated throughout the curriculum in a blended way. Technology should be infused into the entire teacher education program. Throughout their teacher education experience, students should learn about, learn with, and learn to incorporate technology into their own teaching and learning practices.

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[8] For a Kenyan example, see www.kenet.org.
[9] http://www.worldlinks.org/english/html/materials.html
[10] http://www.col.org/programmes/training/toolkits.htm
[11] For more online resources, see for example www.gg.rhul.ac.uk/ict4d/learners.html.

Restricting technology experiences to a single course or to a single area of teacher education, such as pedagogy or teaching methods courses, will not prepare students to be tech-savvy teachers. This calls for relevant, locally produced content and training local people in appropriate content development. However, there is very little multimedia content being developed by and for East African people, let alone in local African languages. High quality multimedia educational content is expensive to develop, and companies with the experience of so doing are reluctant to lose market share by enabling local producers to expand their production of such resources. While there are indeed examples of shareware and free educational resources on the internet, it is exceedingly difficult for users in East Africa to identify what is most appropriate for their needs. Moreover, even where teachers may have access to the internet, the bandwidth connectivity is usually so low that download times can preclude use of much of what is available.[12]

There needs to be a fundamental shift in priorities from the present emphasis on putting hardware into educational establishments to the creation of appropriate content and software relevant to the needs of the different education curricula in East Africa. The complexity of the processes described makes it increasingly important for ICT for teacher training initiatives to engage in partnerships between governments, the private sector, civil society, academic institutions and global organisations. At present, there is considerable interest in delivering educational ICT initiatives across Africa. African governments are eager to use ICT so that they are at the forefront of technological change. Donors and international agencies are eager to provide resources to help 'bridge the digital divide.' The private sector is keen to invest where companies see potential market growth possibilities in the future. Academics are interested in sharing the results of their research on the subject. Civil society organisations are willing to lead innovations and facilitate scale up of tested schemes. This multiplicity of interests confirms the potential for different kinds of partnerships. Tied to this is the great need for sustainability to be built into the conceptualisation of programmes from the very beginning to the end.

Finally, it is clear that the use of ICTs is most definitely not a cheap solution for teacher education. However, by facilitating the creation of new types of learning environments, supporting distance based models of teacher training, and opening up a wealth of new educational resources, it has a very significant role to play. To date, the emphasis of supply-led initiatives across the sub-region has been to provide teachers and pupils with ICT skills, more often than not defined largely as the ability to use Microsoft Office packages in the hope that this will mystically enable them to become better citizens and to gain information that will be of use to them and their societies. This has frequently led to wasteful and inappropriate initiatives that have done little to enhance the learning experiences teachers and students from poor/marginalised communities. The potential of new ICTs to change this situation and to support appropriate and sustainable teacher development programmes is immense, and it is gratifying that all the three governments have recognised this and embarked on ambitious ICT strategies to improve access and quality of education.

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[12] For some specifically low bandwidth solutions and materials see www.africabookcase.org; www.worldspace.com, and www.wougnet.org/Support/WSRP/sdl_telecenters.html.

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