

WITFOR Education Commission Report

Enhancing ICT competence of teachers in the SADC region through innovative learning & knowledge communities

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This WITFOR Education Commission Report includes :

- the case study to be presented by the Education Commission gives an overview of training initiatives for the integration of ICTs in Mauritius. The report focus essentially on the Computer Proficiency Programme (CPP) and the Virtual Centre for Innovative Learning Technologies (VCILT).
- The Education Commission project itself, focusing on the emergence of innovative learning and knowledge communities of teachers
- The research dimension of the Education Commission project, embodied in a Distributed Change Laboratory (DCL)

A more comprehensive analysis of the case study, the project and its research dimension is available in two separate documents, available in pdf format on the WITFOR Education Commission portal [<http://vcampus.uom.ac.mu/witfor/>]

Education Commission Case Study: a comprehensive analysis of training initiatives for the integration of ICTs in education in Mauritius

Some three years ago, the government of Mauritius decided of a national policy to convert the mauritian economy, mainly based on textile and tourism, into an economy of IT-enabled services (ITES) and business process outsourcing (BPO). The promotion of information and communication technologies (ICT), embodied in the creation of a cybercity, lies within the framework of an economic and social re-engineering at the scale of the whole country, *to make Mauritius a cyber-island and a knowledge hub in the indian ocean*. At the light of some major pragmatic projects undertaken in this context, one can witness the emergence of generic implementation mechanisms and methodologies grounding the relationship between society and technology to allow for action.

The case study presents the interacting actors and components of the Computer Proficiency Programme (CPP) resulting in the initial training at computer proficiency level of 36 000 persons, including some 6000 teachers, in a period of two and a half years. The project is presented from a systemic perspective, emphasising the emergence of a composite network organisation, whose sound working principles insure its efficiency and survival.

The Virtual Centre for Innovative Learning Technologies (VCILT) of the University of Mauritius took care of the development of CPP contents & pedagogy as well as of the training of trainers. An overview of VCILT platforms, tools and resources is provided through a community portal [<http://vcampus.uom.ac.mu/witfor>], to be used as a resource centre in the Education Commission project.

- The Computer Proficiency Programme (CPP), a network organisation

In October 2002, the Computer Proficiency Programme (CPP) was launched by the Implementation Working Group (IWG) of the e-Education & e-Training Task Force, chaired by the Minister of Education & Scientific Research (MOESR).

The CPP is a nationwide basic ICT training programme which fits into the government's vision of transforming Mauritius into a cyberisland. The CPP caters for ICT skills at level 3 within the 7 levels of the ICT national strategy for the development of a Human Resource base:

Level 01: ICT Awareness Level 04: ICT Studies

Level 02: ICT Literacy Level 05: Associate ICT Professionals

Level 03: ICT Proficiency Level 06: ICT Professionals Level 07: ICT Specialists

The CPP offers a 48 hours hands-on training on PCs at a very affordable price of Rs 700 (USD 20), thus attracting a lot of people who otherwise, would never enroll for an ICT training course. The programme targets all teachers, secondary school students, the unemployed the working population (factory workers, hotel and service industry, civil servants, housewives and the retired people).

After 30 months of operation, the CPP has reached 36 000 persons, including some 6000 primary and secondary school teachers.

The CPP is a composite network organisation, federating technical and human resources and skills, distributed in various institutions or individuals, under a unique strategic business goal. Each component of the network is selected for one specific strength, so that the programme benefits from an ideal blend of strengths in different domains of activity. Meanwhile, in a spirit close to "Creative Commons", the CPP branding is used by all of its components, with no exclusivity, in a kind of protean organisation insuring that the project remains able to go ahead, even when one component fails.

From an *a posteriori* theoretical perspective, the success of the CPP is based on the respect of a minimal set of rules, deriving from research work on Open Information Systems Semantics (OISS)¹. Self-reliance, empowerment, interdependence, asynchrony, reflexivity and commitment constitute this set of rules, considered as a major reference for the setting up of communities of practice².

¹ Hewitt, C. (1991) " OISS Open Information Systems Semantics for Distributed Artificial Intelligence", Artificial Intelligence, 47, p. 79-106.

² Scardamalia, M., Bereiter, C. (1996) "Student Communities for the Advancement of Knowledge" Communications of the ACM, Volume 39, Number 1, January 1996, pp. 36-37

The CPP is a good example of how innovative solutions can be found for training, without any major investment and a heavy organisation structure. One innovative dimension of the programme, at the root of its quick start and achievement, is an MoU with the Ministry of Education for the utilisation of the State School infrastructure, free of charge, after school hours. The MoU insures free access to the computer labs of 30 State Schools (around 600 computers).

According to a recent report of the World Economic Forum, bureaucracy comes at the first rank of the brakes of development in Mauritius and many other developing countries. Bureaucracy remains an inheritance of colonial time, initially set up for its accountability to foreign control than for its clear contribution to the sustainable development of the country, attentive to the evolution of individual/collective, local/regional dynamics. Network organisations emerge as one of the most credible alternative to bureaucracy.

A network organisation functions as activity systems in which working, learning and innovation are not considered conflicting forces, but rather interrelated, compatible and potentially complementary. To reach its goal, the CPP follows a pragmatic blend of non bureaucratic formal/non formal approaches based on a network of actors from public and private sector, that ensured the success of the programme. CPP can be taken as an example of innovative learning and knowledge community whose network organisation overcomes the barriers often encountered in more hierarchical and bureaucratic organisations.

• The Virtual Centre for Innovative Learning Technologies (VCILT)

The Virtual Centre for Innovative Learning Technologies (VCILT) has been acting as the back office of the CPP project from the beginning, providing evolutive resources and training in a demand-pull fashion, inline with emerging needs.

The VCILT was created in April 2001 by the University of Mauritius, to face the increasing number of students. The VCILT implements new technological tools and new methods closely related with these tools. In March 2005, the centre counts about twenty permanent staff, blend of instructional designers, multimedia, web and infrastructure developers.

Among VCILT's achievements deserving to be mentioned :

- about fifty online/web-enhanced courses at the university;
- major technological developments, including a Learning Object Repository (UoM-LOR) and a virtual campus platform (UoM -iLearn);
- the VCILT participated in 2003 in the creation of the University of Mauritius " Lifelong Learning Cluster " (UoM-LLC) to answer some immediate or emerging needs of the ITES and BPO sectors. In this respect, the LLC proposes training programmes in professional development, such as a fully online Master's Degree on Computer-Mediated Communication & Pedagogies (MSc CMCP).

- Since its creation, the VCILT has been organising or participating in the organisation of several international events in the domains of Technology-Enhanced Education, and Knowledge Creation. Among these events, the ICOOL conference that attracted in Mauritius in 2003 more than 150 researchers from 19 countries. In July this year, ICOOL 2005 takes place in Stellenbosch (ZA), in the context of the 8th IFIP World Conference on Computers in Education (WCCE 2005).

Education Commission Project: enhancing ICT competence of teachers in the SADC region through innovative learning & knowledge communities of teachers

• Partners

The Education Commission project will be led by a consortium whose founding members are as follows:

1. Helsinki University of Technology, through its Lifelong learning Institute Dipoli
2. University of Helsinki, through its Centre for Activity Theory and Developmental Work Research (CHAT & DWR)
3. University of Mauritius, through its Virtual Centre for Innovative Learning Technologies (VCILT)
4. University of Botswana, through its Department of Educational Technology
5. Ministry of Education in Botswana
6. Ministry of Science, Technology and Communication in Botswana
7. University of Geneva, through its TECFA laboratory.

Additional members will be solicited from South Africa, Namibia and other SADC countries. For the time being Helsinki University of Technology Dipoli serves as the technical coordinator until the letters of intent and the contract between the members of the consortium will be signed.

• Innovative learning & knowledge communities of teachers

Based on the principle of coevolution of social, material and technical factors, innovative learning and knowledge communities consider social and technical processes from a systemic viewpoint, in an evolutionary perspective of education and culture, allowing to build meaning and capacity through community development and networking. The WITFOR Education commission's project objective is to mobilise pioneering SADC region teachers and teacher educators to become change agents in improving the professional competence of teachers in using ICT.

Through the setting up of a SADC-wide professional development project and support network, the project aims at :

- creating the conditions for the emergence of innovative learning and knowledge communities of teachers, participating in "the simultaneous reconstruction of educational contexts of which they form a part"

- training a network of Change agents to provide collegial support to these communities, through the setting up of local and distributed (so-called) Change Laboratories (CL).

The CL methodology, based on the Activity Theory of work, helps its actors in contextualising the development of their own work and optimising the use of resources and outcomes, thus strengthening the positive impacts of training by organising teachers to set up local/virtual communities.

In addition to the professional development project of teachers proposed, in the education commission sessions will be discussed the theoretical background for the initiative, earlier experiences, experiments and challenges.

- The professional development model

The objective of this project is to enhance ICT competence of teachers in the SADC region in order for them to utilise ICT in pedagogically meaningful ways in schools and education institutions by :

- 1) setting up a gradually growing number of school-based ICT development groups, starting with Botswana and Mauritius;
- 2) anchoring the work of these school-based innovative teachers groups in the activity theory of work and in particular in the development method called change laboratories (University of Helsinki being the leading research centre in this field);
- 3) supporting these school-based groups from outside by:
 - a. ensuring that the pedagogical leadership in schools supports the work of the change laboratories through supporting the head teachers; and
 - b. supporting participating teachers in the change laboratory activities by a resource centre and network based in and maintained by the Virtual Centre for Innovative Learning Technologies (VCILT) at the University of Mauritius
- 4) linking this emerging network of school-based change laboratories with other networks of teachers and schools in Africa, e.g. SchoolNet Africa; and
- 5) seeking possibilities for setting up for the teachers and head teachers participating in this activity an institutional framework in the blended HE form a professional development or masters programme in ICT enhanced pedagogy through one or several member universities of the consortium.

The professional development model of the project is based on the collaborative development of local and virtual knowledge and innovation communities of teachers by blending work of teachers, learning of students and teachers with innovations (called change or competence laboratories of change agents, comprising of ca 15 members in each). These communities will then be networked with other similar teacher communities supported by mentors from national teacher education institutions networked also with a virtual resource support centre and a diaspora of experts, involved from the beginning as partners of the project.

Education Commission Research : A Distributed Change Laboratory (DCL)

The Distributed Change Laboratory (DCL) is the WITFOR Education Commission research project. The DCL is a research-action project whose first objective is to assess the relevance of the Change Laboratory (CL) methodology in the regional context. The second and main objective is to adapt the CL methodology to this context and apply it over the network of communities of the WITFOR Education Commission project, as a collegial support framework, supported through an internet community portal.

The CL methodology was developed by a group of Finnish researchers led by Yrjö Engeström since the mid 1980s. Based on Engeström's theory of expansive learning, the Generic Change Laboratory method was developed in 1997, as a condensed way to carry out Developmental Work Research, an activity theory based methodology for studying and developing work practices in collaboration between the researcher and the practitioner. Used in Finland in tens of public and private organizations representing many branches of industry, the CL has been applied successfully in health care services in Finland (Engeström, Virkkunen et al., 1996) and in the USA (Hall & Hord, 1987 & 2001) (NTTAC, 2005), as well as other innovation schemes, e.g. for the integration of ICT in schools (Engeström, Engeström & Suntio, 2002). The purpose of the method is to help a work team or the members of an organizational unit to encounter the problems they face in their daily work and systematically analyze the systemic causes of these problems and design and implement a new form for the activity to overcome the root cause of daily problems (Virkkunen, 2003).

The DCL research project brings about a systematic and methodological reflexive dimension to the professional development proposal of the WITFOR Education Commission. It thus appears as a coping strategy, as defined by the UNESCO MOST project for the management of social transformations.

- Coping strategies

Coping strategies capture local strategies that result from the process of reflexivity. They include three dimensions; innovation, networking and formation of identity. The first dimension - innovation - stresses the ability to find new solutions to socio-economic problems within a global and increasingly knowledge based context. The second dimension - networking - stresses one important mechanism in creating new social relations; the development of interpersonal relations that are transcending the limits of institutionalised social fields. The third dimension - formation of identity - is the active formation of identities that can reflect on educational discourses from the local to the global (Aarseth, et.al. 2001): the "global top" and the "local bottom" act collaboratively to reform what is in between (Baerenholdt, 2000) (Beland Lindahl, 2001).

A prerequisite for the establishment of local coping strategies is the perceived "opening" of the existing systems. In our case, WITFOR can be considered as a triggering event for this opening, in relation with the massive introduction of ICTs in the development process, and with the emergence of the Knowledge Society paradigm at the international level (e.g. WITFOR theme : ICT for accelerated development)

- The concept of change

The concept of change is usually reserved to structural long-lasting transformations of an activity system, whether in a complex organisation, in a group or an individual. One of the goals of WITFOR in general, and of the WITFOR Education Commission project in particular is to open a space for (re-) negotiation and change of obsolete unefficient process, without necessarily threatening existing structures. Obviously, the work undertaken cannot become sustainable without, in parallel with individual change of mindsets, a gradual change occurring inside traditional institutions and structures (schools, TELs, etc). This gradual change will not happen just by the magics of wishful thinking.

- A task force of change agents

The rationale for the WITFOR Education commission's project is to mobilise pioneering SADC region teachers and teacher educators to become change agents in improving the professional competence of teachers in using ICT through a SADC-wide professional development project and network. The project aims at establishing a SADC-wide teacher support network and enhancing professional development of teachers and teacher educators through a network of so-called change laboratories.

The role of the change labs (CL) is to train a task force of "change agents", acting in their own school/college/training institution as a collegial support informal mechanism to plan and monitor the implementation of activities as per schedule. Change agents will act both locally to foster empowerment, progress and quality, and also through a distributed change laboratory, embodied in the community portal.

This type of framework, currently under development at the VCILT is inspired from a similar network implemented by the NTAC³, in the USA.

The change agent using the CL method:

- negotiates the project with the management and the intended work team/unit
- collects mirror material (videos or others) about the work to be used in the sessions
- selects and edits the mirror material for the sessions
- plans the agenda for the sessions and the learning actions the practitioners are supposed to take: task, material, analytic tools
- facilitates the discussion, acting as a radical outsider prompting discussion
- secures the multivoicedness of the discussion and a balance in the participation
- helps the group to report the process

The VCILT is currently busy working on the specifications of a portal for change agents, to be added to the seed resource centre already provided. The objective is to propose a

³ NTAC operates under a Cooperative Agreement between the National Association of State Mental Health Program Director (NASMHPD) and the Center for Mental Health Services (CMHS), Substance Abuse and Mental Health Services Administration (SAMHSA) in the US.

documented design and contents proposal for the portal, to be discussed during ICOOL in July in Stellenbosch with most of the project partners, in view of eventually implementing by the end of August, and present it at the workshop following WITFOR.

The objectives of this community portal are:

1 - to present state-of-art resources and documentation on developmental interventions in organisations, process of collective learning and change labs.

2 - to conceptualise, define and structure a virtual space to be used as a distributed change lab anchor.

3- to conceptualise, define and structure online templates and instruments for the reflection of :

- model, vision
- ideas, tools
- mirror and data collection tools

as per the change lab methodology.

This portal will be used both as a methodological support for future change agents, and as an instrument to help them with :

- the followup of ongoing projects in schools or training centres,
- the mirroring of these projects
- the close support of the collective concept formation, and successive cycles of planning & implementation.