

# Planning an Multi-institutional Information for Development Study Centre

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**Abstract:** This paper describes the processes followed in establishing an I4D Study Centre at the Meraka Institute (South Africa). The initiative started as a joint effort between the Meraka Institute (South Africa) and University of Eastern Finland (Finland). It is to be funded by the Ministry for Foreign Affairs of Finland and the University of Eastern Finland. The Centre's main objective is to support Meraka Institute achieve the goal of South Africa having critical mass research capability in selected niche areas. The I4D Study Centre tasks are to increase both the research expertise pool available for Meraka and the partner university, and the joint development of study programs with universities that will prepare students for a researcher career with an ICT4D agenda. The Centre will also link the research abilities of North West University (NWU) and University of Cape Town (UCT) with Meraka's research agenda. The Centre is to provide the training needed for students to be able to become researchers. For a start three research areas have been identified in the areas of *education, health and environment*. The training will be implemented through the delivery of courses and supervision of students working towards their research degrees. The EdTech<sup>Δ</sup> group brings its expertise in supervising students remotely and its knowledge of creating or coordinating the creation of online courses for post-graduate students. The Tumaini (Tanzania) collaboration has served EdTech<sup>Δ</sup> to acquire the working knowledge of helping to run a university department in Africa and crafting an IT curriculum that is adapted and relevant to Africa. Hence, the EdTech<sup>Δ</sup> plans to develop the curriculum for the Centre and put in place the processes to be able to adapt it as it grows. The road to educate Master's and PhD's within the Centre will first be piloted by carrying out Honours' studies in conjunction with partner universities. The successful implementation of the project will provide with a working model of Study Centre that can be adapted to other topics and countries.

**Keywords:** Study Centre, Information for Development, collaboration.

## 1. Introduction

This paper describes the processes that have led to initiating the "I4D Study Centre in South Africa" project which started as a joint effort of Meraka Institute of the CSIR and EdTech<sup>Δ</sup>, the educational technology research group of the University of Eastern Finland (UEF). The project will apply for funds to the Ministry for Foreign Affairs of Finland and the University of Eastern Finland. Thus, the main reason of this paper is to show how the history, and common work, of a Finnish research groups and South African research institute has shaped the idea of the I4D Study Centre. Moreover, with this paper we aim to

publicize the project and gather feedback for the implementation phase. This paper does not make a case for the I4D Study Centre, nor its results, as it is still in the planning phase.

The *Information for Development (I4D) Study Centre* aims at building up the I4D expertise in Southern Africa. The starting phase of the I4D Study Centre will focus on bringing the expertise to South Africa and exposing students and researchers to it. The ultimate aim of the project is to establish a self-sustaining unit for I4D education in South Africa that will serve also the needs of its neighbouring countries.

The studies will be aligned with Meraka’s strategic R&D areas to strengthen and support Meraka. The process of establishing and running the Study Centre will allow edTech<sup>Δ</sup> to utilize fully its extensive experience in educational technology and ICT4D research, and in developing both face-to-face and online masters’ and PhD programs. The following sections outline the background from which the project was initiated. The last two sections outline the main lessons learnt and the questions that are still open.

## 2. The South African Context – Meraka Institute

The Meraka Institute is an operating unit of the Council for Scientific and Industrial Research (CSIR) South Africa which focuses on information and communication technology (ICT). Meraka is in the business of research, innovation and advanced human capital. With over 200 staff and postgraduate students, Meraka is the largest organisation in South Africa dedicated to ICT research.

The Meraka Institute derives its mandate as a national strategic initiative from the South African President’s 2002 State of the Nation Address and was launched in May 2005. Meraka’s mission is to build a world class ICT R&D institution that generates national benefit by enabling ICT access, inclusion and use. The vision is to position South Africa as a leading developing world ICT player and contribute to the creation of a people centred, inclusive and safe information society.

### 2.1 Meraka’s Expertise

Meraka is organised into four competency areas with a number of research focus areas that are mostly relevant to the activities of the I4D centre.



Meraka’s R&D expertise ranges from putting together systems useful for a variety of development objectives in important areas such as education, disability, health, etc to pushing the frontiers of research in the areas listed above, with more information on some specific groups and projects being mentioned below.

#### 1. Living Lab Research Group

Living Labs are systemic initiatives, which focus on creating multi-stakeholder collaboration in different stages of the research, development and innovation process (Eriksson, M., Niitamo, V.-P. & Kulkki, S., 2005). The Living Lab (LL) research group

was formed in 2007. Since 2009, Meraka is responsible for hosting and maintaining the Living Labs in South Africa network (LLiSA), and already involves 10 established LL. Success of this network is dependent on the user which should be driving the innovative process and also to become self sustainable (Ståhlbröst, A., 2008). Currently the LLiSA network hosts workshops and conferences to allow for interaction and sharing of best practices amongst the different LL and also to balance the stakeholder engagement processes

## 2. Mobile Education

Meraka Institute started doing research in Mobile Technologies in 2005 with the MobilED initiative. The MobilED (Mobile Education) was an international collaborative project between international universities and the WikiMedia Foundation (United States) with device support from Nokia. The MobilED project aimed at integrating mobile technology and services into teaching and learning and thus promoting meaningful interactions with information MobilED endeavoured to provide an alternative access to the information age so as to prepare learners for full participation in the knowledge society and the acquisition of 21st century skills (Botha, A. and E. Gregory, 2009). The approach for the development and integration of this technology was that mobile phones could act as terminals to content and services; thus opening up new perspectives on design and development practices as well as the use of mobile technology in formal and informal learning. Competencies developed in the project extend to development of mobile platforms, creation of digital content, transfer of skills to students in Mobile Technologies, and awareness of social relations with technologies.

### 2.2 *Meraka's Challenges and Opportunities*

Despite having significant expertise and a variety of high impact projects of a national strategic nature, due to the fast growth of the Meraka Institute (from 60 to over 200) since its launch in 2005, it has proved extremely difficult for Meraka to source the requisite research leadership needed from the local economy. Additional research leadership is a key need across all Meraka's research groups and is the space that EdTech<sup>Δ</sup> is going to support.

Secondly, since the student supervisory capability at Meraka is already quite stretched, it is proving challenging to implement teaching interventions to assist the local universities bring students up to the level required in Meraka's niche areas, so the I4D centre is intended to help fill the teaching and supervision gap.

## 3. **Creating Expertise in Finland by Working in Africa**

The research group EdTech<sup>Δ</sup> has a long tradition on working in Africa, and during this time a substantial expertise has been created. In addition to several bilateral student and staff exchange agreements with African HEIs, current and past academic collaboration initiatives of EdTech<sup>Δ</sup> include North-South-South Open Doors (<http://www.cimo.fi/dman/Document.phx?documentId=1w20008145110926&cmd=download>), Edulink Consortium, and North-South 5ARTS Program (<http://cs.joensuu.fi/5ARTS/>).

The following subsections outline some of the most relevant projects that EdTech<sup>Δ</sup> has carried out in Africa and provides information on other projects of the research group that are relevant to the Study Centre.

### 3.1 *Kid's Club and Other Collaborations*

A concrete example of the collaboration between the two groups is the *TekkiKids* project. TekkiKids was a Kids' Club that was implemented in Meraka Institute. The Kids' Club concept is a combined research laboratory and technology club developed by and still

actively ran by the EdTech<sup>Δ</sup> group (Eronen, P.J., Sutinen, E., Vesisenaho, M., & Virnes, M., 2002). TekkiKids gave children the opportunity to experiment with science and technology in a fun, relaxed atmosphere with none of the constraints and pressure to perform found in traditional classroom teaching. The project activities were carried out parallel in Finland and South Africa.

On a different partnership with North West University, EdTech<sup>Δ</sup> has created a learning game for mathematics using mobiles: UFractions. In UFractions, the mobile interacts with colourful fraction rods to develop a story that engages the students in learning. The game was evaluated in five schools in the North West Province in South Africa.

### 3.2 *Designing and Implementing a Contextualized Curriculum in Tanzania*

The research group EdTech<sup>Δ</sup> has worked for more than a decade in Sub-Saharan Africa, where the hub of our research and development collaboration has been Tumaini University in Iringa, Tanzania. The group's work in Iringa region started in the end of the 1990s in terms of ICT training and programming courses. In the early 2000s collaboration intensified and led to a joint project for developing a new, contextualized IT program for Tumaini University, Iringa University College. The aim of that new program, launched in 2007, is to train IT professionals who can meet the needs of the largely rural Iringa region, and who can respond to the challenges of a developing country. Exchange programs, such as North-South-South (funded by the Centre for International Mobility of the Ministry of Education of Finland) and EduLink (funded by EU) have brought in fresh ideas through student, lecturer, and researcher exchanges.

### 3.3 *IMPDET*

International Multidisciplinary PhD Studies in Educational Technology (IMPDET) is an *online* doctoral study program (<http://cs.joensuu.fi/impdet>) which specializes in the fields of educational technology and ICT4D. As its name suggest, IMPDET fosters multidisciplinary research and accepts students from all over the world, thus creating a highly multicultural, multitalented community of researchers. Main research interests of IMPDET include contextualised and culturally sensitive technologies and pedagogies, and ICT for development. Through IMPDET, a student may get the maximum benefit of the courses taught by esteemed professors and researchers in the fields of educational technology and ICT4D. We see IMPDET as a well-established and tested concept that could be utilised in the I4D Study Centre to provide doctoral level studies in an online basis.

### 3.4 *EduLink – Alanga Project*

The EduLink – Alanga project (<http://cs.joensuu.fi/edulink>) is an on-going European Union funded project that aims to build capacities to produce and use ICTs for development purposes in Eastern, Western and Southern Africa through the sharing of expertise between existing ICT4D networks in Africa and Europe with an established history in supporting and building ICT capacity in Africa. The project's partners include eight Universities in Europe and in Africa and together they have established three main objectives:

1. Create a shared curriculum for ICT4D
2. Increase research and technology capacities of ICT4D partner institutions
3. Link two major African-EU IC4D networks to create the ICT4D Consortium

From these the first objective, to create a shared curriculum for ICT4D, is particularly related to the concept of I4D Study Centre. The project has recognised that a curriculum for ICT4D education does not exist in the partner institutions. Therefore the project aims to

develop a shared curriculum which could be based on online studies, and whose materials are problem-based, theoretically informed and conceptually rigorous.

### 3.5 *SciFest – From Grahamstown to Joensuu*

SciFest Africa science festival has been held in Grahamstown, South Africa on yearly basis since 1997. In 2005 researchers from the EdTech<sup>Δ</sup> research participated the event by running workshops related to their respective research fields. Thanks to the positive experiences gained at the SciFest in Grahamstown, Department of Computer Science of Statistics at University of Joensuu organised a SciFest festival (<http://www.scifest.fi>) in Joensuu simultaneously with the SciFest in South Africa in 2007. Since then, SciFest has been an anticipated, yearly event for school children and youngsters, attracting thousands of visitors to Joensuu from nearby regions and countries all over the world (40 nationalities at SciFest 2008). Since 2008, Meraka and EdTEch<sup>Δ</sup> have established the North-South Gateway to support intercontinental experiences such as tug-of-war (2008) and tic-tac-toe (2009) where teams located in two countries thousands of kilometers apart battle against each other by using physical instruments (e.g. rope, floor tiles) over a virtual connection.

## 4. Using the Expertise - I4D Study Centre

As seen on the previous sections both Meraka and the group EdTech<sup>Δ</sup> have pushed for ICT and development for a long time. EdTech<sup>Δ</sup> group has built a considerable expertise in linking the ICT education in Africa and Europe together. The result of that expertise is the desire and ability to become a major force in Information for Development in Africa. The close work done with several African Universities and Meraka in the past allows for committed relationships in the present to develop the I4D Study Centre.

The I4D Study Centre will link the research abilities of North West University (NWU) and University of Cape Town (UCT) with Meraka's research agenda. Based on that, three different research areas have been selected. First, the *education* area will link the efforts done in NWU in education and rural development with the Meraka projects in mobile development and ICT education. Second, to work in *health* issues in a development context, e.g., epidemic control, UCT mobile development expertise will be linked with the remote sensor group (ICT4EO) at Meraka. Third, Meraka's remote sensing research unit (RMRU) together with University of Eastern Finland will complement each other in researching about *environmental* issues. As said before, the idea of the I4D Study Centre is to provide the training needed for students to be able to become researchers within the partner universities and the Meraka Institute. The training will be implemented through the delivery of courses that are common to all the areas, and courses that are specific to each of them. Moreover, supervision of students working towards their research degrees will be catered by the I4D Study Centre.

In the years that the IMPDET program has been running, the EdTech<sup>Δ</sup> group has developed two important skills. First, it has been supervising students remotely; second, it has been creating or coordinating the creation of online courses for post-graduate students. These two skills will be playing a key role in the I4D Study Centre. Through the collaboration between EdTech<sup>Δ</sup> and Meraka Institute, IMPDET studies could be coordinated from South Africa, thus making it easier for the student to attend to seminars held in the African continent. Furthermore, the course curriculum of IMPDET will be adjusted to cover the topics related to the I4D Study Centre objectives.

The Tumaini collaboration has served EdTech<sup>Δ</sup> to acquire the working knowledge of helping to run a university department in Africa and crafting an IT curriculum that is adapted and relevant to Africa. With this knowledge, the EdTech<sup>Δ</sup> plan to develop the

curriculum for the I4D Study Centre and put in place the processes to be able to adapt it as the I4D Centre grows.

Running the Edulink-Alanga project has helped EdTech<sup>Δ</sup> to establish a large network of several African IT and CS departments. The coordinating process and the constant exchanges in the project reveals the opportunities and needs that can be found around Africa: rural development, AIDS/HIV education,...The I4D Study Centre aims to reach to these countries and prepare their IT students for the development tasks and research that their countries need. Moreover, new initiatives from the group, like I4D Study Centre will enjoy the universities support by enrolling their students or letting their lecturers teach at the I4D Study Centre.

As with other African partners, the ongoing collaboration with Meraka and the exchange of staff has created an environment where new projects from both sides can be realized. This is especially true in Meraka, for Meraka and EdTech<sup>Δ</sup> have several similar research lines. In the I4D Study Centre will cover those, but also others from the University of Eastern Finland.

#### *4.1 Planning the I4D Study Centre*

The first concrete steps in establishing the Study Centre were taken in Spring 2009 as part of Meraka's Dr. Thato Foko three months' visit at EdTech<sup>Δ</sup> in Joensuu. The Emerging Innovations group with funding from SAFIPA project sent Thato to the University of Joensuu on a post-doctoral knowledge exchange programme. The aim of the exchange was for Thato to acquire ICT4D skills so that upon completion he could provide Meraka with leadership support in the area. During his time at the University of Joensuu Thato was involved in many activities including Erasmus Mundus project proposal development, PhD day seminars, UniPID Virtual Studies "Quality Assurance and Lessons Learnt" workshop, North Karelian Africa Society conferences, working with students on their projects, and contribution to the proposal for the establishment of the I4D Study Centre. The exchange programme offered Thato opportunities to experience first hand the Finnish social and cultural life.

At Meraka, a new office has been set up for the starting phase of the I4D Study Centre. Part of the EdTech<sup>Δ</sup> group, led by Prof. Sutinen, moved to Meraka for three months in 2009 (September-December) to prepare the project proposal together with the Meraka staff. The stay combined formal and informal meetings with Meraka staff, visits to partner universities and possible partner schools. The meetings with the staff, included meeting several research directors, planning meetings and an open conference for the rest of the staff about the I4D Study Centre plans.

The visits to the partner universities in the project, North West University and University of Cape Town, served to identify the curriculum needs and the double degrees plans with University of Eastern Finland. In the North West province, visits were done to 3 schools to assess the current state of ICT in education in both primary and secondary education. As well, this visits served to identify potential schools for implementing Living Labs in them, which would be integrated in the I4D Study Centre as study and research lab.

#### *4.2 Preliminary Implementation and Schedule*

The I4D Study Centre's main objective is to support Meraka Institute achieve the goal of South Africa having critical mass research capability in selected niche areas. The I4D Study Centre tasks are to increase both the research expertise pool available for Meraka, and the joint development of study programs with universities that will prepare students for a researcher career with an ICT4D agenda, that can serve both Meraka and private companies.

The road to educate Master's and PhD's within the I4D Study Centre will first be piloted by carrying out Honours' studies in conjunction with the partner universities, which will be issuing the degrees. The Honours' studies consist of approximately 9 months, divided in 6 months of course work and 3 months of practical research. The Honours' programme will be aligned to the research currently done in the partner universities and Meraka, and the practical research will be in projects relevant to Meraka in cooperation with the partner universities.

The course work of six months will be further divided in two sections. In one, students will be trained in the competencies of the partner institution, i.e., education and human language technologies at NWU, and mobile usability at UCT. The other courses will introduce students to the foundations of research and I4D, e.g., ICT4D, eHealth and sensor technologies. The teaching method at the I4D Study Centre will be blended, with some courses being on-site at the partner universities campuses, and online course having intensive on-site seminars at partner universities or Meraka installations.

The Honours' studies should serve to increase the reputation of the I4D Study Centre and it will be the basis to accredit an expanded version of it as a double Masters' degree from the one of the partner universities and the University of Eastern Finland.

The I4D Study Centre will be in charge of recruiting the experts that design and deliver the courses planned. These experts will be frequently recruited from the University of Eastern Finland and the partner universities, but Meraka staff and others will also be considered for the position. These same experts will also be required to supervise the practical work of students at partners' research groups, providing them with guidance and field knowledge that may be required for each project. The experts are required to closely support the students in the on-site seminars, and to take part in the practical stage by supporting Meraka staff in the practical training. As well, when not present at the campus or Meraka offices, they should be available online to continue their teaching and supervision.

The project implementation should start in 2011. The first stage of the project will start by introducing courses in existing Honours' programs at the partner universities' departments of Computer Science and Education. In the second year, the new Honours' program will start simultaneously in the partner universities, where the students will enrol, and it will contain the courses and the practical training at Meraka.

Using the feedback gathered from the institutions and students while running the Honours' program, a Master's program in I4D would be designed. Having worked with the partner universities in the Honours' program, the new Masters' program should be readily accepted. The plan is to start the Masters' on the third year after introducing the first Honours' courses.

## **5. Extending the I4D Study Centre**

Reasons for choosing NWU and UCT at the moment are the strong base of local supervisory capability in selected Meraka R&D areas and quality postgraduate students in which to pilot a blended approach in South Africa.

In the future, other historically disadvantaged universities will be considered for further development of the I4D Study Centre concept. These historically disadvantaged universities will be selected to build significant research capability locally within those universities in specialised I4D areas with specific development from undergraduate to postdoctoral level through the resident I4D Study Centre at that university. The I4D Study Centre's role will be to expand local capacity and improve their research output.

## 6. Lessons Learnt

Several lessons can be drawn after the experience of the planning phase. The most important one is readiness for change. During the planning phase, the call for proposals changed the requirements from partners, which led to a project reorganization. The funding mechanism disallowed the funding of non-Finnish partners. These changes prompted an open discussion with the partners on the direction of the project and to conversations with the funding agency on how to overcome the problems. In our case all the partners were flexible and, at the same time, understanding of each other's obligations and goals.

For EdTech $\Delta$ , the planning phase in South Africa served to learn important aspects on how South Africa and its research and educational institutions are established. The political issues involved in research and education only arose after a certain time in the country. EdTech $\Delta$  tried to establish itself as a neutral partner among the local ones and helped to steer the project to the common good. We believe that the long stay at South Africa helped the Finnish partner to understand better the local conditions for the project to succeed.

## 7. Discussion and Conclusion

The I4D Study Centre is another step of the long term collaboration between EdTech $\Delta$  and the Meraka Institute. This time, the targets have evolved from introducing ICT in primary education, with TekkiKids, to a full program that aims to develop South African tertiary education, and its research capacity, in ICT4D. By concentrating in the strengths from both sides, energies in the project will be fully utilized in developing students' abilities and research interests that are aligned with ICT4D.

Collaboration between foreign institutions and South African Universities has already been successfully implemented by the French-South African association for engineering education (F'SATIE). The main difference between F'SATIE and the I4D Study Centre is the use of a hub, Meraka in this case, to guide the educational efforts of partner universities, providing students with a possible research career within Meraka in South Africa.

As this is a new approach involving Meraka, UEF and the partner universities, there are logistical and acceptance issues that need to be explored extensively. Some issues include:

1. How will these courses be included in the partner universities curriculum?
2. Will this approach receive senate approval?
3. What physical presence is required by Meraka and UEF to operate at the partner institution?

In the current planning of the I4D Study Centre, we expect the gradual implementation of the studies will facilitate finding the solutions that are beneficial for all the partners involved. As well, the commitments of all the partners in previous mutual projects should have built the trust needed for a successful implementation of the study centre.

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