

# **Design, Implementation and Institutionalization of Mobile Learning in Higher Education**

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Formal Education  
Technologies for scaling up ODL programmes.

## **INTRODUCTION**

For a long time new technology had been slow to penetrate sub Saharan Africa. The costs of most of the technologies, including land line telephones, computers and internet are still very high and hence prohibitive to majority of the people in Africa. Governments on the other hand have been slow in providing the necessary policy provisions for access and utilization of the technologies. However, in the recent past, African countries such as those in East Africa have formulated policy frameworks for information communications technology (Wamakote, Ang'ondi & Onguko, 2010).

When the mobile phones emerged in the East African market, for example, they were very costly and hence considered as a status symbol for those who were in the higher socio-economic class. The days when mobile phones were seen as status symbols are, however, long gone and over the last decade, mobile phones were the most accessible form of technology in most parts of Africa. Mobile phones have penetrated remote areas of Africa, are used in different sectors and are changing peoples' lives in positive ways.

Among the sectors in which mobile phones have become very vital are banking, health management and education. In education, for example, as Houser, Thornton and Kluge (2002) have noted, mobile learning (i.e. learning with mobile devices) will extend what web-based learning delivered namely study beyond physical classrooms towards anywhere; anytime learning. Mobile devices are generally very small and hence portable making them very user friendly. This paper presents an initiative on mobile learning implemented at the Aga Khan University, Institute for Educational Development in East Africa. The details of the program are presented in the following sections.

### **Educational Leadership and Management Course**

The Aga Khan University-Institute for Educational Development, Eastern Africa (AKU-IED, EA) is involved in teacher training programs specifically certificate level courses and masters level courses. The certificate courses are delivered in three phases where phase one entails a face-to-face mode followed by phase two of practicum period and then a third phase of face-to-face-session. During phase one and three, the students meet for three weeks in each phase. In phase two, the students are visited by the facilitators in their schools for support, and while they also attend Saturday seminars once a month.

The certificate in education program entails courses for teachers as well as for school leaders. In the leadership and management courses, the practicum period does not involve instructors observing the students as they teach in their classrooms but rather it takes the form of discussion of management and leadership practices with the students outside the classroom. This paper highlights one certificate level course that incorporated mobile learning in delivery of the learning experiences.

The educational program reported in this article is the Certificate in Education: Educational Leadership and Management (CE:ELM) held in Kisumu, Kenya between August and December 2008. Subsequent programs to the one in Kisumu were held in Mombasa, Kenya and Mvomero district of Tanzania. In the program discussed in this article, a design of mobile learning support was incorporated as a means of:

- Taking advantage of readily available technology – mobile phones
- Addressing the isolation for students during practicum
- Cutting down on the time used for visits to schools during practicum
- Cost cutting on expenditure on the course without compromising on quality.

### **MOBILE LEARNING DESIGN AND IMPLEMENTATION PROCESS**

Miles (1986) and Fullan (2001) have both asserted that the change process unfolds as a series of three stages namely: initiation, implementation and institutionalization that merge into each other. The design, development and implementation process for the mobile learning program was based on these stages. The mobile learning process design entailed a series of steps and processes as explicated in the following subsections.

#### **Initiation by Necessity**

The initial discussions on inclusion of ICTs in delivery of the certificate course were held between two colleagues involved in the educational leadership and management course. The discussions concerned how and why there should be incorporated a technology component in the course. The two colleagues together thought of using internet technologies and specifically the Moodle virtual learning environment of the University for supporting the students through discussion fora, chat rooms, wikis and posting of notes by both instructors and students for further review.

When one of the two instructors visited the course site at the Lakeside city of Kisumu during the selection process for students and to hold initial discussions with the host institution, the Aga Khan primary school, the reality onsite immediately became clear. The importance of moving from the planning site to the implementation site became clearer as some of the ideas in the plan could not be easily implemented on the ground. As this was the first attempt by the university to host its certificate courses in a rural setting, there were bound to be some challenges. Previously such courses were only held in major cities and towns such as Dar es Salaam, Zanzibar, Pemba, Kampala, Nairobi and Mombasa. The thought of using the internet as the technology of choice by deploying Moodle virtual learning environment for the students was not going to be realistic. The use of Moodle was not possible because the students:

- Were drawn from both urban and rural settings with no or limited exposure to computers
- Had no access to computers and hence internet
- Lacked the requisite basic computing skills.

It was, however, noted that all the 42 potential students who applied to participate in the course had personal mobile phones. With the above realities, the course instructors deliberated and reflected on the possibilities and reached a mutual agreement that they had to make use of easily available and cheaper technologies which happened to be the mobile phones. Their decision was confirmed by Traxler and Dearden (2005) who asserted that there are lively and energetic mobile phone networks in Kenya, and there are high levels of mobile phone ownership, acceptance and usage. The instructors picked on the use of short message service (SMS) for text messages to be used between students and instructors. The short message service was ideal for use in this course because it also leaves an evidence trail by allowing for the conversations through the messages to be saved in a database both in the phone and other external databases.

Hence an idea of mobile learning support for students at a distance was born at the university. Out of necessity, availability, and innovation in technology it became possible to deliver a

program in East Africa with a different media format. The view above is backed up by Sharples, Taylor and Vavoula (2005) who identified that an emerging trend relevant to a theory of learning in the mobile world is that some developing countries, particularly in sub Saharan Africa, are bypassing the fixed network telephony to install cell phone networks to rural areas. The scenario above, according to the authors offers opportunity for people in rural communities not only to make phone calls, but to gain the advantages of mobile services such as text and multimedia messaging. These authors saw education in the mobile technology era as conversation in context, enabled by continual interaction through and with personal and mobile technology.

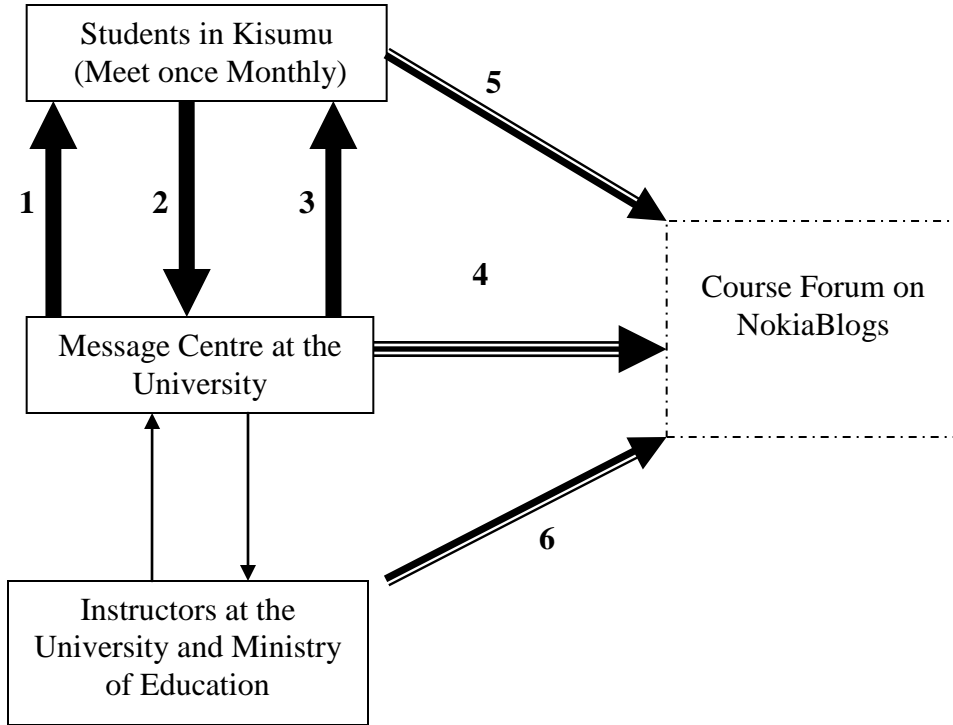
On return from the course site, the author shared views with the IT manager and the head of teaching programs who coincidentally happened to be one of the instructors in the course. The two colleagues so enthusiastically received the idea hence coming up with a workable way forward. Further discussions went on between the two instructors and the IT manager leading to convergence of ideas from both the pedagogical side and the ICT technical side. The educational ideas were driven by desire for innovation to help save on the precious time for frequent flights between Dar es Salaam and Kisumu during the course while retaining if not improving on the quality of program delivery. It is important to note that Dar es Salaam to Kisumu is a distance of about 1300 kilometers and these are locations in two countries (Tanzania and Kenya) with no direct flight on the route. The instructors' visits to schools would have ideally taken at least one or two weeks each month for three months where the instructors would hire taxis for visiting the students in schools.

To ensure quality in the course, the instructors redesigned some instructional aspects of the course. For example, since the visits to schools for conversation with students was not included, the use of SMS conversations and clusters of students for peer support were put in place. The instructional design process hence emphasized empowering student clusters for providing peer support to one another while linking up with the facilitators via the mobile learning process. In this way the professional discussions went on through these two channels.

The IT manager had critical input in the design process for the course as he looked at the process from an innovation point of view by emphasizing that such an innovation was important for the university as evidence of venturing into the unknown. Further according to him, it was a major cost-saving mechanism for the institution. With the two complementary rationales, the joint design of the data flow process and scenario illustrations as shown below commenced.

The data flow and communication structure was designed such that messages could emanate from the students located at the course site or from the instructors located either in Nairobi or Dar es Salaam. These messages were about updates on the course, communicating important messages, reminders of meeting dates and more importantly inquiries about different aspects of the action research process. The messages were received at a central message centre within the university in Dar es Salaam, saved on the NokiaBlogs software and rerouted to the instructor concerned or to the student and vice versa as indicated in Figure 1 below.

*Data structures, design and communication*



**Fig. 1.** Data Flow

The course outline was presented to the Academic Review Committee (ARC) of the university where some questions were asked in a bid to understand what the innovation was about and what value it would add to the course. The questions and comments raised by ARC helped in improving on the innovation. The idea was finally endorsed by ARC. The university received the idea well with a view that if well implemented it could be the future of certificate programs and hence fully supported it both financially and technically by allocating the resources required. The SMS flow chart was predesigned as in Figure 2.

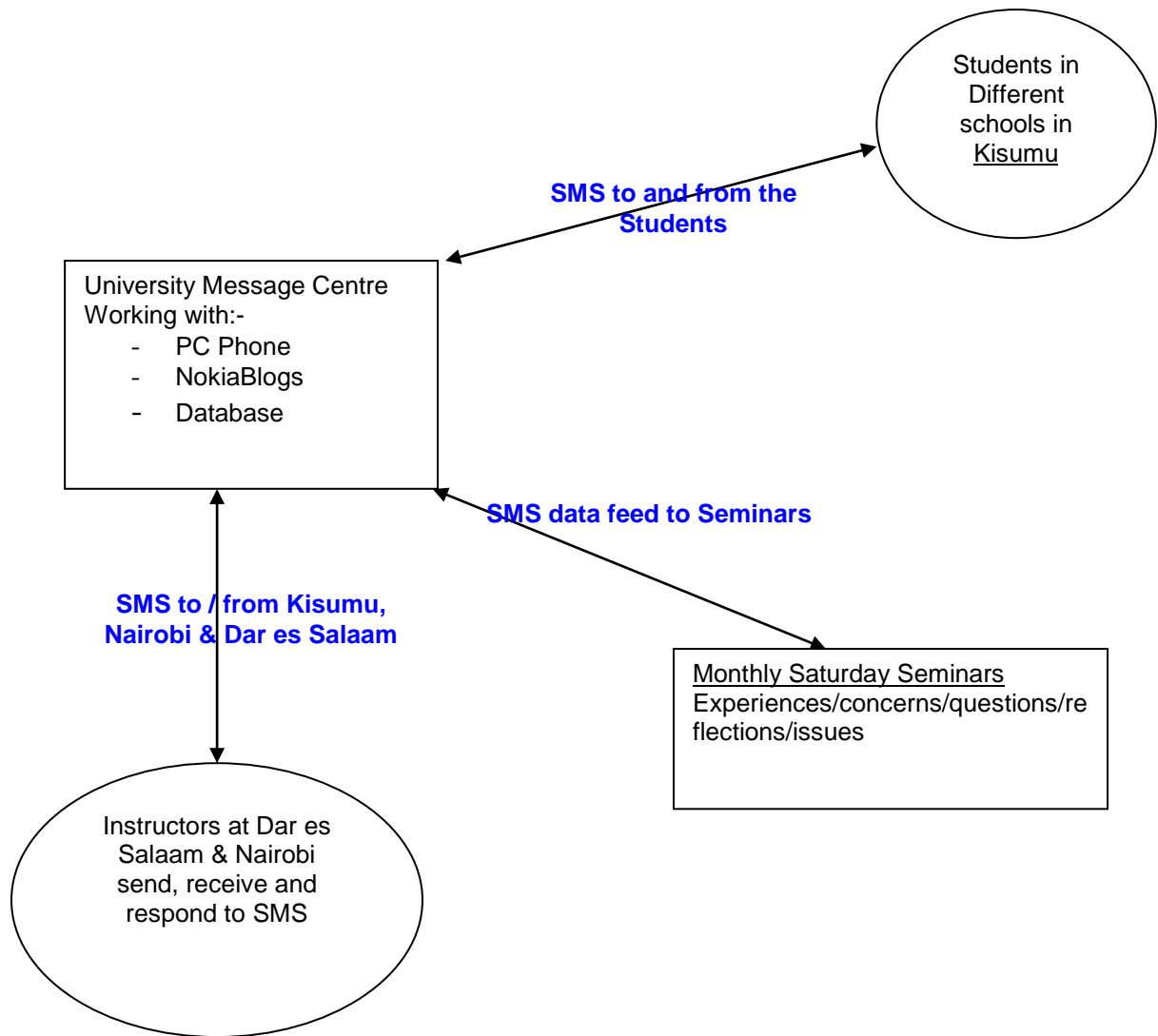


Figure 2: SMS Flow Chart

### Implementation

When the four course instructors moved to the course site in Kisumu by first taking one week to plan for the whole program of delivery, the two part-time Professional Development Teachers (PDTs) were quick to embrace the mobile learning plan. They willingly committed the use of their personal mobile phones for the course for receiving and sending text messages from and to students respectively. On the first day of the course, the content of the course handbook was presented to the students and they too were enthusiastic about the support mechanism through the use of mobile text messaging. It seemed as if a revolution was about to happen in education in our part of the world. The students saw themselves as the first to participate in a unique program within their setting.

The initial demonstration of the mobile learning support with the students was rolled out after two weeks of commencement of phase one face-to-face session in preparation for presentation of the topic: ICT as a catalyst for change. This roll out was meant to demonstrate two things:

- That technology can indeed be a catalyst for change; as happened for this course leading to the redesign of the course and hence increased access for students and reduced travel for facilitators
- The mobile learning support process during phase two of the course.

The students instantly responded to the common SMS sent out to them on a Sunday afternoon with a response rate of 73% being realized out of a total number of 26 students. The remaining students, some who did not receive the SMS due to various reasons, for example, some had two different phone numbers hence were on a number they had not made available to the instructors. These students on realizing what they had missed the previous day quickly changed their sim cards and responded while in class. This was an impressive response rate to a simple message which went as follows:

*Dear Student. Text me your brief reflections on the CEELM course. It is very important that you reply via SMS to this number immediate u receive this msg. Thnx Your Instructor*

The above message and the responses were used to illustrate how the mobile learning component would work during phase two of the course. On departure day that also marked the end of phase one of the course, the instructors were allocated to students in clusters for whom they would provide support. The instructors hence left with a two-page work done by each one of their allocated students on their action research plans. The instructors were requested to provide feedback in one week's time via SMS hence initiating the dialogue with individual students. Students were also informed of the need to get in touch with their supporting instructors through SMS at least every fortnight. This process picked up well.

In phase two the students operated in cluster groups of three or four members. The students met once monthly in their respective institutions alternately for peer support. The text messages took the form of shared experiences to instructors using a given structure to the PC Phone (Nokia N95). The messages were constructed in shorthand language agreed upon as part of the SMS structure. The students and instructors' text messages were about reminders, comments, information or updates, instructions, questions or enquiries, fears or worries, feedback on progress, issues arising from cluster meetings, and follow-up on Saturday seminars among others.

The messages from the students and instructors were formatted as NokiaBlogs and shared with all instructors and students during the Saturday monthly seminars. The desire to have the conversations posted onto MOODLE discussion forum by the ICT technical team at the institution was not successful due to some technical challenges.

#### *Initial views from course participants*

The views as captured on the first trial for use of the handheld devices are presented in the screen shot from the Nokia Liveblog below.

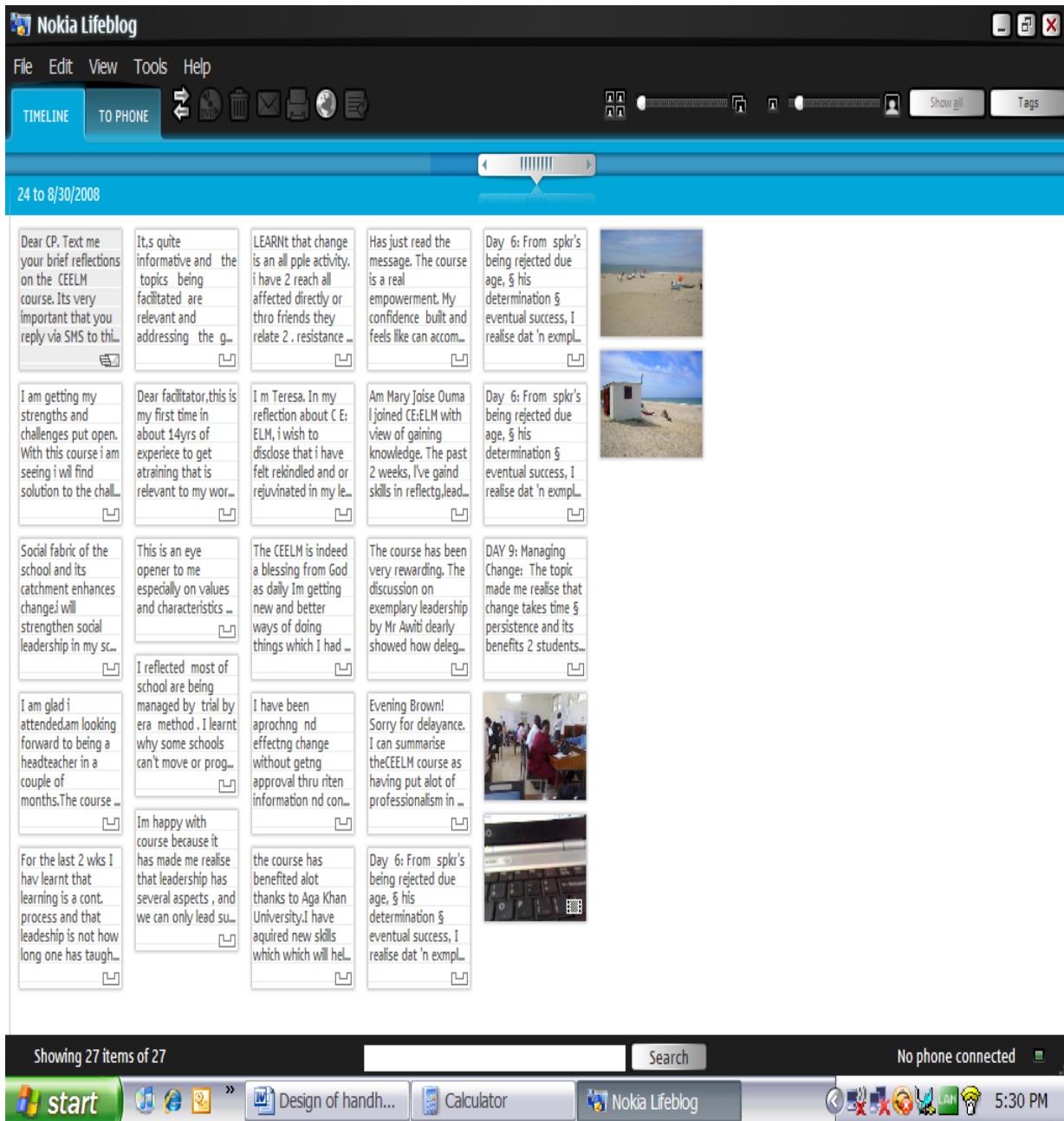


Figure 3. NokiaBlogs Screen shot

### Institutionalization

Institutionalization entails the process of streamlining a program thus making it part of the activities of an organization. Reporting on institutionalization of service into academic programs, Bringle and Hatcher (2000) citing Morton and Troppe, 1996) identified six features of institutionalization that are relevant to this article as:

- Existence of congruence between institutional mission and strategic planning
- Broad acceptance of the need for long range planning and allocation of resources to support service learning
- Centrality of faculty to planning
- Provision of incentives to faculty e.g. course development stipend, release time

- Faculty work is widely publicized
- Campus plans for integration of service into academic study over time and across personnel.

As was envisaged, after evaluation of the mobile learning process for the initial course, recommendations would be made on the way forward for the use of such technologies in the other programs at the institution. There was a research study that accompanied the initial pilot of the mobile learning project. The findings of the study together with other practical realities such as the savings that were realized from the initial pilot led to commencement of the institutionalization of mobile learning. Several other courses have since been held with mobile learning support across East Africa including at Mombasa in Kenya and Turiani in Tanzania.

The process of implementing the mobile learning initiatives at the institution can be linked to the community college change model developed by Carter and Alfred (1998 cited in Owen & Demb, 2004). This model provides for five key dimensions for managing change namely: Understanding fundamentals; forging strategy; identifying champions; supporting innovation and communicating and celebrating success (Owen & Demb, 2004). According to Owen and Demb, this model allows for integration of leadership strategies, participatory involvement, environmental scanning and communication.

## **CONCLUSION**

The bold venture by the university to include a mobile learning component in the certificate courses was a positive step that reflected quick institutional change and learner benefit. This innovation has led to recognition of the need to utilize locally available technologies in delivery of programs by the university. Mobile learning initiatives are being mainstreamed by the university in both health and education programs in Asia and Africa. Currently there is a mobile learning initiative at the Karachi site of the university which should hopefully lead to deepening of the institutionalization of mobile learning.

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