

A Framework for Instantiating Pedagogic mLearning Objects Applications

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Abstract. An increasing desire to port learning objects on mobile phones exists. However, there is limited understanding on how to pedagogically obtain access to and use learning objects on mobile phones. The limited understanding is caused by a dearth in frameworks for underpinning the development of mobile learning objects applications. Following Design Research methodology, we developed a Mobile Learning Objects Deployment and Utilisation Framework (*MoLODUF*) to address this problem. *MoLODUF* is composed of twelve dimensions, including: MLearning Objects, MLearning Device, MLearning Interface, MLearning Connectivity, MLearning Process, MLearning Costs, MLearning Resources, MLearning Context, MLearning Pedagogy, MLearning Ethics, MLearning Policy and MLearning Evaluation. The *MoLODUF* makes significant extensions to existing electronic and mLearning frameworks. It provides a competency set of guidelines for developing and/or evaluating applications for deploying and utilising learning objects on mobile phones.

Keywords: mLearning, mLearning Objects, Framework, mLearning Objects Framework, mLearning Objects Deployment, mLearning Objects Utilization, *MoLODUF*, mLearning Objects Applications, Makerere University.

1 Introduction

Of recent, learner mobility has been enabled by use of mobile devices in their learning processes. This process has been termed ‘mobile learning’ or ‘mLearning’ for short.

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Due to its embryonic nature, the practice of mLearning is still insignificant. As such, mLearning requires increasing research attention to let it mature. Research related to mLearning development, practice and evaluation is necessary. More so, little research attention has been accorded to the development of frameworks for instantiating pedagogic application for mLearning objects deployment and utilisation.

In [32], a pedagogic framework for mLearning is given. The framework categorizes educational applications of mobile technologies into four types, namely: 1) high transactional distance socialized mLearning, 2) high transactional distance individualized mLearning, 3) low transactional distance socialized mLearning, and 4) low transactional distance individualized mLearning (p.1). Other researchers [4, 5, 13] have also developed frameworks for theorizing about mLearning. All these frameworks are aloof to issues necessary for instantiating and/or evaluating pedagogic mLearning objects applications and environments. In [21, 34, 43], research that specifically targets development of frameworks for guiding the instantiation of applications for obtaining access to and utilising learning objects on mobile devices is called for.

In this paper, we have developed a Mobile Learning Objects Deployment and Utilization Framework (*MoLODUF*). *MOLODUF* provides process steps for instantiating pedagogic applications that can enable learners in developing countries obtain access to and use learning objects, delivered over the Internet, regardless of their proximity to higher education institutions, through the use of mobile phones. *MoLODUF* can also be used to evaluate mLearning environments in developing countries. Developing countries are faced with a hoard of infrastructural constraints which inhibit conventional eLearning [11] but on the other hand, they are embracing mobile telephony at unprecedented rates [18]. For instance, by the end of 2009, the Compound Annual Growth Rate (CAGR) for mobile telephony stood at 28.7 Percent for Uganda, 92.7 Percent for South Africa, 63.4 Percent for Ghana and 66.7 Percent for Egypt [18]. Such impressive mobile telephony permeation statistics are good recipe for mLearning [28, 41].

mLearning is a subset of eLearning [5]. Research into mLearning should thus be informed by earlier developments in eLearning. To develop a mLearning framework, one has to draw from existing eLearning frameworks. In [13], [20] and others, eLearning frameworks have been developed. A review of these frameworks posts the Global eLearning Framework in [20] as being the most comprehensive of all eLearning frameworks. For this reason, the development of the *MoLODUF* was guided by the Global eLearning Framework in [20]. The Global eLearning Framework [20] suggests implementation of eight dimensions for meaningful eLearning to occur. These are the *Pedagogical*, *Technological*, *Interface Design*, *Ethical*, *Institutional*, *Evaluation*, *Management* and *Resource Support* dimensions. Through *Design Research* [2], the Global eLearning Framework in [20] was extended to include dimensions that allow for learner mobility.

Design research is; "... a systematic but flexible methodology aimed [at improving] educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories". [48, p.6]. The framework developed in this study provides important guidelines for developing and evaluating mLearning objects applications and environments. It was developed from dimensions adduced from answers to the following six research questions;