

## How can Badges be Used in Seamless Mobile Learning

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**Abstract:** By examining technology as a nexus between informal and formal learning environments, we are interested in leveraging motivational aspects that could potentially be a driving force for more sustained learning. We would like to see our students spontaneously engage in informal learning which is either self-initiated or emerges indirectly inspired by the school based activities (Kupiainen, 2013). All this is built into a system named SamEx which includes digital virtual badges, which we designed, built, and used on a sample of 350 students over a 1-year period to conduct the experiments described in the paper.

### Introduction

Mobile learning technologies present an innovation force ready to support on-demand, in-situ and real time learning scenarios and are already being utilized in a number of initiatives around the globe (Chen, 2013; Hargis, Cavanaugh, Kamali, & Soto, 2013). The ubiquitous nature of such technologies is “personally relevant in terms of topics of interest and capitalizes on learners' location as learners decide what, where, when and whether to learn” (Jones, Scanlon, & Clough, 2013; Munoz-Organero, Munoz-Merino, & Kloos, 2012).

Seamless mobile learning harnesses the portability and versatility of mobile devices to promote a pedagogical shift from didactic teacher-centred to participatory student-centred learning. Learners learn whenever they are curious and seamlessly switch between formal and informal contexts and between individual and social learning, extending the social spaces in which they interact with each other. Seamless learning is supported by theories of social learning, situated learning, and knowledge-building, and should influence the nature, the process and the outcomes of learning.

### Badges as alternative credit systems

In addition to formal course credit systems which include standard examinations, there is a growing need for alternate ways of motivating both curricular, extracurricular activities and lifelong learning. This is especially true in online courses and technology enhanced learning tools which are used in and out of schools, where teachers need to ensure that students' additional efforts are acknowledged and appreciated. This can be done via virtual badges which get embedded into the learning tools (Sharples et al., 2013). Badges indicate the achieved competence level as defined by the issuer. The integration of badges into existing software is supported by the Mozilla Open Badge Infrastructure (Mozilla, 2013), while a first set of studies on badges in learning has been spawned by the MacArthur Foundation through the Digital Media and Learning competition (MacArthur Foundation, 2013). One of the first such studies shows that ability and motivation of learners have to be considered when choosing the right kind of badges to be used and the kinds of effect they could have on critical learner motivations (Abramovich, Schunn, & Higashi, 2013).

### SamEx Seamless Mobile Learning Application

SamEx was developed for the Windows Phone 7 and 8 mobile operating systems in the Seamless Learning Curricular Innovation in a Singapore primary school. Activities were designed for primary school students who used SamEx throughout a 1-year period. In addition to collecting, storing and accessing multimedia artifacts (Figure 1), SamEx can store contextual users' information for potential educational use. Depending on the current time and users' location, the system allows question prompts to be displayed on students' smartphones potentially facilitating or scaffolding learning tasks.



motivation and do not care about quality of contributions. Sharers are on the other hand interested in sharing with their peers while earning their badges and their participation is more consistent and with higher quality. Dodgers are not interested in earning badges at all (Figure 4).

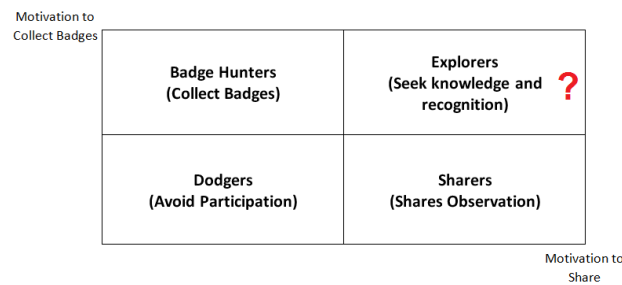


Figure 4 Students according to the impact of badges on motivation, quality of contributions and interest spans

This means badges can only encourage the first two groups of students to participate. However, badge hunters will stop participating once they achieve their desired level of badges. Sharers make meaningful contributions and ask good questions. Both badge hunters and sharers are not interested in learning collaboratively since there is no observable learning with peers, putting no students into the ideal target category of Explorers (Figure 4).

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