REPRESENTATIONS OF AN INCIDENTAL LEARNING FRAMEWORK TO SUPPORT MOBILE LEARNING

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ABSTRACT

This paper discusses how the particular features of mobile learning can be harnessed to provide new informal learning opportunities in relation to context aware and location based learning. The MASELTOV project is developing representations of an incidental learning framework to enable software developers and researchers to both design and analyse learning journeys to support social inclusion and language learning. Visual representations act as boundary objects that enable interdisciplinary conversations and reveal potential issues. Mobile learning offers the possibility of scaffolding the transfer between settings, and we identify location as a key element of making learning relevant to the user's situation. This affordance is illustrated with the example of the application of mobile learning, and in particular, incidental learning, to assist the target audience (recent immigrants) in the MASELTOV project. This project is developing an incidental learning framework which we have used to explore in detail the potential incidental learning journeys which may be undertaken by the immigrants, and in this paper we discuss the current framework, and the challenges in generating representations that support useful debate.

KEYWORDS

Learning framework; context-aware learning; language learning; urban environment; social inclusion; immigrants; location-based services.

1. INTRODUCTION

Mobile learning can help people use their everyday experiences for incidental learning. Clough *et al.* (2008) have described the uses of mobile devices for informal learning that also highlight the importance of place and personal space, as the learners they studied "*deployed their devices in ways that were appropriate to their current physical and temporal context and learning needs*" (p.364). The MASELTOV project - Mobile Assistance for Social Inclusion and Empowerment of Immigrants with Persuasive Learning Technologies and Social Network Services (http://www.MASELTOV.eu/) - is focusing on the use of smartphones as a support for recent immigrants to Europe. The aim is to develop technology rich and socially inclusive learning opportunities for immigrants within cities. The social exclusion of many immigrants can be attributed in part

to underdeveloped language skills, hence the project is investigating how these skills may be acquired and developed in informal ways that fit in with immigrants' lives. Learning opportunities can arise in various locations around the city (location-based learning), which also provides new challenges for designers and developers of mobile tools. As a result, new technology enabled learning activities can emerge. For example, learners will have particular needs for support and opportunities for learning in locations such as the bus stop, the train station, the bank, the supermarket or the health centre and they will be able to access this support from their smartphones.

The links between mobile learning, context and location have been commented on by a number of researchers. For example, Kukulska-Hulme *et al.* (2009) write: *Traditional classroom learning is founded on an illusion of stability of context, by setting up a fixed location with common resources, a single teacher, and an agreed curriculum which allows a semblance of common ground to be maintained from day to day. But if these are removed, a fundamental challenge is how to form islands of temporarily stable context to enable meaning making from the flow of everyday activity'* (p23). Brown et al. (2010) relate this strongly to location as follows: *'The distinguishing aspect of mobile learning is the assumption that learners are continuously on the move. This is not just their physical mobility, but also how learners are active in different contexts and how frequently these might change, depending on an individual's location.'* (p7). Scanlon (2013) reviews the literature on mobile learning and in particular features of mobile learning that allow for location-based learning (especially in relation to collaboration), describing both location-based and location-aware learning. Nova et al. (2005) describe some systems as location-aware, i.e. *'knowing where the user is can lead the system to trigger specific events or to allow him/her to post messages bound to this specific location.'* (p21). Location-aware learning is an emerging paradigm and our contribution focuses on developing a framework that will support the design and evaluation of learning activities appropriate to the urban setting and target group. Our framework considers a number of dimensions, and considers not only location, but other aspects of context-awareness, such as time, and social resources available; however, we acknowledge location as of key significance when considering the particular affordances of mobile phones.

2. THE MASELTOV INCIDENTAL LEARNING FRAMEWORK

In the MASELTOV project, the concept of the service user's location triggering activity is important, in particular how incidental learning -: *"unintentional or unplanned learning that results from other activities"* (Kerka 2000, p.1) - may be delivered in particular contexts by a mobile service. The project has developed a number of scenarios to consider the range of activity that the service might support. A first version of an Incidental Learning Framework (see Figure 1) was produced to analyse mobile incidental learning in detail and to facilitate the communication of learning designs appropriate to the situation in which an immigrant wishes to use the service (see e.g. Gaved et al., 2012). The Framework considers the place an incident occurs, task(s) the learner is carrying out, the tools the learner uses, the social support that the learner makes use of, the learning outcomes to be achieved and the (relative) time the incidental learning occurs. Both place and time can contain contextual information and social support can include collaborative activity. The target audience has been identified as finding it difficult to access classroom based learning opportunities due to other commitments, and hence mobile learning offers a way of providing better access to language learning resources, as well as being more appropriate to their immediate situation; for example by enabling access to fellow learners at any time, not restricting learning interactions to a particular place, and enabling daily activities to become triggers to learning episodes. MASELTOV's goal of supporting language learning within the context in which it is applied can be seen as a form of situated learning. Mobile devices such as smartphones, with their portability, give the MASELTOV audience the flexibility to learn wherever and whenever they wish to; however, the provision of learning support also needs to take account of the context in which the situation or learning episode is happening.

The MASELTOV support services and tools will be delivered through an app downloaded to the user's smartphone. The MASELTOV app brings location as a context to the fore, along with time. Timely feedback, related to the user's current location, can provide highly relevant content to support their needs or stimulate

reflection or further learning. However, given MASELTOV's goal of supporting a journey towards social inclusion and language learning over an extended period of time, 'contextual support' may be relevant not only in immediate response to an action, but also by offering a recommendation that can be acted upon later at a time more suitable for the user to respond. Smartphones, with their network connectivity, computing capacity, and on board sensors, have enabled mobile language learning with multisensory contextual support to become a reality for the MASELTOV target audience. A central concern is to enable effective learning that takes advantage of the tools' ability to recognise the contexts (place, people, and time) in which they are used.
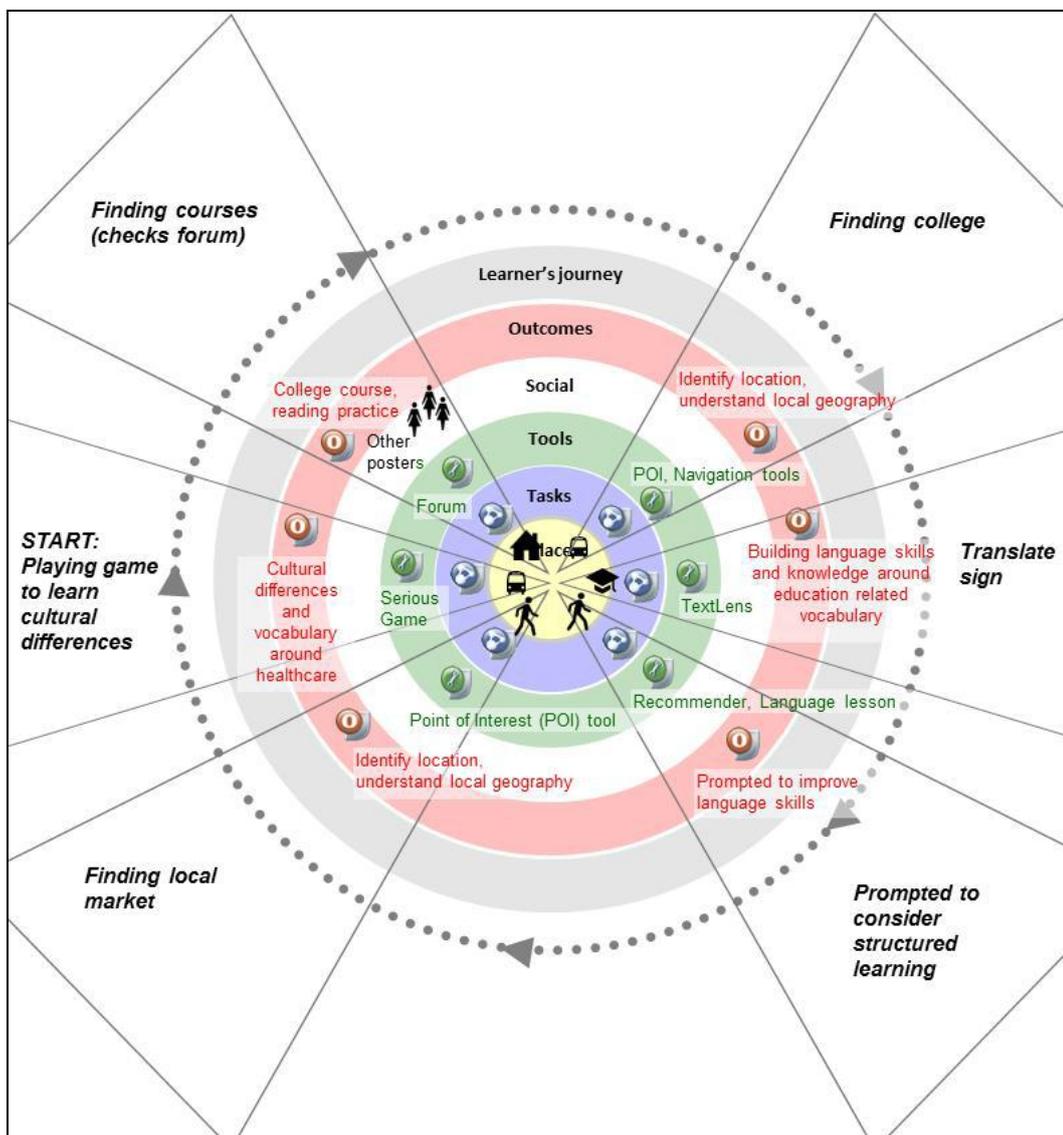

Figure 1. An incidental learning framework for the MASELTOV project describing key elements of learning: places, tasks, tools, social support, outcomes, and learner's journey.

While the original Incidental Learning Framework diagram enabled high level discussion of issues and reflection of what is encompassed by its key elements, a detailed mapping of a learning trajectory could not be sufficiently captured. We have since extended this framework by creating further visualisations to explore each element in more detail; for example Figure 2 unpacks the concept of 'Place' describing the range of affordances that may be associated with particular places that the MASELTOV service user is likely to encounter. It includes a series of questions about a particular place to prompt developers' reflection, whether

technology use was acceptable in the location, whether there was an urgent need for support in that location, whether the location offered the possibility of connectivity with wifi or associated GPS, and whether the location allowed for different (time) durations of learning opportunities. This work complements the range of attributes of 'place' derived from studies of informal language learners using mobile technologies (Kukulska-Hulme, 2012), which drew attention to the nature of the place (e.g. public, private) and the mobility of the learner (e.g. stationary or moving). Early work in context-aware computing was largely focused upon the integration and abstraction of data from environmental sensors, e.g. Abowd et al.'s (1997) conceptualisation of a tour guide that would utilise video, GPS, and camera input to trigger context-sensitive resources to provide historical, cultural, or linguistic support. Such early conceptualization have been realised in more recent research due to the presence of a range of affordable and compact sensors built into the current generation of mobile phones. Sensors which derive information about the device's use can also enable contextual support, for example utilising accelerometers in phones to interpret the activity currently being undertaken by the user, and providing suitable resources in response. Bristow et al. (2004) identified that body position (e.g. sitting, standing, or walking) was a key aspect to defining the context of the user when considering what resources were appropriate to recommend to them. Here we have highlighted place as an example. We have also unpacked the other key elements of the framework in other secondary visualisations.

Figure 2. A visualisation of the range of affordances that may be associated with particular places that a MASELTOV service user is likely to encounter during their daily activities.

3. WORK IN PROGRESS AND CONCLUSIONS

We are testing the utility of the framework and its variety of representations in the design of the MASELTOV user's learning journeys. As noted here, features now included in smartphones can support location based and location aware learning in a way that has not hitherto been possible. However, there is a need to develop our understanding of learners' needs when they are engaged in incidental situated learning as part of their everyday lives. The Incidental Learning Framework (ILF) described here is a step towards

developing that understanding. It allows us to both analyse mobile incidental learning by considering key elements of learning: places, tasks, tools, etc. and how they come into play in different learning journeys. Secondly it provides a tool for communicating with designers of the tools and services. Testing of the framework has revealed that more detailed interogations of each element of the ILF are required to enable developers to successfully identify suitable learning approaches and resources, and we are currently testing this second generation of representations. Mobile incidental learning has received relatively little attention until recently. However, given the current capabilities of smartphones there is likely to be much more focus on how it might be supported by contextually-aware devices. We expect to refine the ILF further as a result of the MASELTOV field trials in 2014, thereby extending our understanding of mobile incidental learning.

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