

## **Social presence awareness for knowledge transformation in a mobile learning environment**

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### **ABSTRACT**

Knowledge sharing occurs between humans, rather than being a human-computer process. Knowledge transformation is an outcome of individuals' knowledge-sharing experiences. Social interaction is central to both knowledge transformation and to learning. When learners intermingle, there may be a shift in knowledge due to the social interaction. Consequently, knowledge transformation is a social process that occurs when there is an interaction among learners. In a contact university, learners perform tasks in three locations: formal contexts, semi-formal contexts and informal contexts. Learning tasks are presumed to be constant but a mobile learner carries the tasks across different environments. However, as learners move across different contexts, they do not have access to the same social networks for sharing knowledge and learning experiences. The paper conceptualises a mobile learning environment that provides social presence awareness as a learner traverses different learning contexts. It highlights how through synchronous mobile instant messaging, social presence provides learners with continuous awareness of available social support, thus facilitating the on-demand and opportunistic sharing of knowledge.

**Keywords:** *Knowledge transformation, social presence, social interaction, instant messaging, learning contexts*

### **INTRODUCTION**

Learners in South African universities come from diverse social backgrounds, with different languages and cultures. Some learners come from previously disadvantaged schooling systems where direct interaction or one-on-one contact with an instructor is quite unusual because of large classes. Assuming that the instructor is the only expert available to draw on, these learners tend to be unaware of other available social resources they can draw upon for knowledge consultation. The resources may take the form of lecturers, tutors, knowledgeable peers and other expert personnel. Additionally, learners often encounter problems that may need immediate attention or are time-driven; and generally they feel the lack of context-sensitive and anywhere, any time academic support as they traverse various learning locations. Limited support is normally only available at fixed times (i.e., during instructor office hours) or seminar slots, and the opportunity for engagement in large lecture theatres is limited, if not almost impossible.

For these higher-education learners, a viable alternative – one that complements existing opportunities – is to engage in a mobile learning activity through social interaction with knowledgeable peers who share a background. Sharing learning experiences could provide useful academic support. This paper grapples with the ways that social awareness of knowledgeable peers with shared background, languages and cultures, regardless of a learning location, could be leveraged to enrich the learning and knowledge transformation experience. Specifically, the contribution of this paper is an exploration of the possibilities that social presence awareness, in ways that are sensitive to the background and context of a learner, provides propinquity of available social resources regardless of location of the learner and task at hand.

How can social presence awareness be used to support a learner moving across different locations? My conceptual model is a learning environment that facilitates on-demand 'anywhere, any time' consultation and continuously assures a learner of the availability of a social support network. To this end, ubiquitous communication and social interaction is exploited to support learner mobility across varied learning contexts. As learners move between contexts, a knowledge sharing environment moves with them, hence maintaining access to available social resources regardless of context.

The conceptual model described in this paper underpins empirical work described elsewhere (Kekwaletswe, 2007; Kekwaletswe & Ng'ambi, 2006a; 2006b). These works show how learners merge context and social presence awareness for purposes of mentoring and sharing learning experiences. The empirical research was carried out over a period of 18 months on the University of Cape Town's upper campus and in the residences using a Contextual Inquiry methodology. About 70 mobile learners and tutors participated with and without mobile devices. Contextual Inquiry is a research framework that depends on interactions with actors in the context of their work. Hence, the empirical work was done with participants engaged in authentic learning tasks. The general finding was that learning actions are influenced by changes in the environment and in social awareness. Learners in mobile learning environments use social awareness to model their actions for the provision of personalised academic support. Social awareness is found to be synonymous with awareness of context and social presence. The studies concluded that context and social presence awareness is of vital significance to how learners share learning experiences.

The purpose of this paper is to focus on one element of the empirical work: the potential of the mobile instant message to contribute to mobile learners' interaction through its social presence indicator. A mobile learner refers to a learner who is not fixed to specific learning locations. The paper identifies the various elements of the model, drawing on the limited related literature available and showing how learners' engagement can be enhanced through mobile technologies. In particular, the potential of mobile social presence indicators to contribute to learners' interaction is emphasised.

## **CONCEPTUALISED MODEL**

The conceptual model assumes a contact university where learners attend formal lectures and laboratory sessions. In a contact university, there tends to be disproportionate access to available social resources between the times when learners are attending scheduled or formal classes and when they are away from scheduled classes. It is therefore useful to distinguish between the learning contexts in which a learner's experience takes place. These are: formal contexts such as scheduled classes and laboratory sessions (where a learner's behaviour is modelled according to the university class timetable); semi-formal contexts such as libraries, walk-in laboratories, cafeteria and mingling areas (these contexts may represent informal spaces on campus used by learners while waiting for the next lecture to start); and lastly, informal contexts (the characteristics of an informal learning context are not explicit; however, these contexts include working after-hours, weekends or in university residences and private homes).

These different contexts are generally not permeable. However, since acquiring, sharing, or transferring knowledge is a location-independent learning activity, the available resources for social support ought to move with a learner. In this regard, the problem is that of ensuring that the resources remain socially present and consistent for supporting a learning task regardless of the location of a learner. Providing personalised academic support to learners includes recognising the huge and sometimes complex volumes of information a learner deals with. To alleviate this challenge, I sought a model that helps reduce cognitive loads by providing on-demand

information in smaller chunks and at the right time, regardless of a location. This model provides ubiquitous knowledge sharing and learning support to a learner as he or she traverses the varied contexts. The goal is to create a presence and context-aware consultation system that provides a knowledge-sharing space and supports a learner in the various contexts through the use of context-aware social presence mechanisms. In the model, the mobile learner has access to the same social network or resources regardless of his or her location and learning context.

**Figure 1:** *A model for ubiquitous social presence awareness in an IM-learning environment*

The conceptual model (Figure 1) depicts social presence awareness in a mobile learning environment. Social awareness is a mental concept where a learner becomes aware of the social network that follows him or her while moving across the different learning contexts. In the figure, a learner is consciously aware of available tutors, lecturers and knowledgeable peers should they encounter a learning problem for which they need to consult. By the same token, a peer is consciously aware of other mobile learners as well as available experts (lecturers or tutors) should they not be able to address the learning problem encountered. They both access a consistent social network and resources even as they move away from formal learning contexts. The social network provides a necessary social interaction whose outcome may contribute to knowledge transformation in the mind of a learner.

The context-independent social presence awareness is achieved via mobile instant messaging (IM). The mobile instant messaging client is installed on Wi-Fi enabled PDAs. IM interactive space is used to exchange and transfer knowledge in a textual form. That is, mobile learners share what they know through instant textual messages. The mobile IM environment, through its social presence awareness feature, shows a learner who among his or her peers, lecturers and tutors (social network) is available for a potential immediate and impromptu face-to-face consultation. The next section briefly describes the concept of social presence and its role in facilitating knowledge transformation.

## **SOCIAL PRESENCE**

Social presence gives a sense of the extent to which a communication medium facilitates awareness of the other. It is a measure of the feeling of community the learner experiences (Tu & Mclsaac, 2002) in a mobile learning environment. It is also the degree to which a person is perceived as a 'real person' in a mediated communication (Gunawardena, 1995). To examine social presence, the relationship between media and socio-cultural construction of knowledge should be explored (Mclsaac & Gunawardena, 1996). The role of social presence (Short et al., 1976) has been explored in online collaborative learning situations (Gunawardena, 1995) and distance class environments (Tu & Mclsaac, 2002) but its application in a mobile learning environment has not been addressed. This paper suggests that it is equally pertinent in a mobile learning environment.

Social presence theory is defined as the 'degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships...' (Short et al., 1976:65). They define social presence as a quality of the medium itself and theorise that communication media differ in their degree of social presence, and that the differences are key in determining the way individuals interact. The argument that the quality of the communication media determines its social presence or richness is contradicted by Ngwenyama & Lee (1997) who envisage that the communication richness of a media is dependent on who and how you use it. Rafaeli (1990) argues that social presence is a subjective measure of the presence of others, while 'interactivity' is the actual quality of a communication sequence or context. I am in agreement with Rafaeli,

Ngwenyama and Lee in that the context in which an interaction takes place determines social presence. For example, the determining factor may be how fast a learner or tutor in a remote location needs a response or it may be how much they need to be aware of another's emotional involvement.

Mediated social presence involves social interaction using a communication medium, such as instant messaging, to come to know the meanings, cognitions, emotions and behaviours of another mind (Sallnas et al., 2000). Since social presence refers to the feeling of being socially present with another person at a different or remote location, it can be 'cultured' among participants (Walther, 1994). For instance, people interacting in a text-based IM environment tend to develop an ability to express emotions through the use of 'relational icons' or 'emoticons'. This 'socially cultured' argument, yet again, diverges from the Short et al (1976) argument that social presence is mostly an attribute of the communication medium.

Although social presence theory has not been explored in mobile learning environments, research to date has shown that social presence can be strongly felt by participants in computer-mediated communication (Walther, 1994; Tu & Mclsaac, 2002) and that students' perceptions of social presence have a strong influence on their satisfaction with online courses (Richardson & Swan, 2003; Tu, 2000; Gunawardena et al., 1997). Researchers have demonstrated both that students perceive the presence of others and that they socially present themselves (Gunawardena, 1995; Picciano, 2002).

My argument is that learners use awareness of a social presence to engage in a social interaction whose outcome is knowledge transformation. Thus, social presence is redefined and understood to be the mobile IM mediated presence of another learner, tutor or lecturer who could provide personalised on-demand social support for a learning problem as the learner traverses varied learning contexts.

The following section discusses how IM offers both the interactive space and the much needed social presence as the learner finds himself in varied learning contexts and locations.

## **KNOWLEDGE-SHARING SPACE**

Social presence provides learners with the indications of the possibility of a supportive learning community. The role of such a community (social network) in a higher education context can, amongst other things, be that of an enabling knowledge-sharing space. This paper suggests that such a knowledge-sharing and interactive space can be afforded through mobile instant messaging (IM). IM is a tool that successfully supports formal and informal communication (Grinter & Palen, 2002; Grinter & Eldridge, 2001) and hence offers the potential to facilitate knowledge transfer instantly. Cases have been reported where instant messaging was preferred to informal face-to-face conversation because it is less intrusive and allows multi-tasking (Nardi et al., 2000). According to studies by Grinter & Palen (2002) and by Nardi et al. (2000), IM has been adopted by teenagers for socialising, and by adults for both social and work purposes. It seems that the possibilities of IM for learning have not been exploited or researched. Yet indications are that the social presence indicators afforded by instant messaging enable and support informal social interaction and communication, and contribute to its value in knowledge transfer and education.

The literature on instant messaging suggests that conversations have a specific character: they tend to be brief (but could also be used for longer, discontinuous interactions among peers or learners) and mostly cover a single topic, and both media switching and multi-tasking are prevalent. Despite the IM social presence, learners can still engage in other activities while

maintaining the presence. Secondly, IM is used for the following general functions: quick questions and clarifications, coordinating learner-tutor meetings, coordinating impromptu social meetings, and keeping in touch.

In a mobile learning environment, mobility and social presence of both the learner and the social support network are no longer limited, unlike in wired communication spaces or environments. Since a mobile IM client is installed on a mobile device (PDA) that can be carried everywhere, the learner is ensured of the opportunistic and on-demand social interaction with the social network in their contact list, regardless of time and their location. Serendipitous learning and knowledge transformation may be realised in this mobile learning environment. Knowledge, and its transformation, is discussed in the following section.

### **KNOWLEDGE TRANSFORMATION**

Acquiring, sharing, and processing knowledge are all essential activities of learning. Knowledge is an ambiguous, unspecific and dynamic phenomenon, intrinsically related to meaning, understanding and process (Alvesson & Karreman, 2001). Knowledge is fundamentally intertwined with the social settings in which it is encountered. Schutz (1997) views knowledge as possessing radically different meanings for different individuals, based on their biography and positions in the social setting. It involves the mental processes of comprehension, understanding and learning that go on in the mind and only in the mind, however much they involve interaction with the world outside the mind, and interaction with others (Wilson, 2002).

Knowledge transfer and sharing is ultimately a human-to-human process. Since this process is inherently interactive and dynamic, the knowledge, in essence, transforms while or during the very process of its transfer (Shariq, 1999). Knowledge transformation is thus a social process that occurs when there is a shift in knowledge, perspective or thought process due to the social interaction.

Social interaction and knowledge transformation can be mediated by technology. In a mobile context, interactive and dynamic knowledge transfer process is realised through mobile instant messaging as learners communicate by writing text and sending graphic messages. However, such messages are unlikely to carry 'knowledge' but rather constitute 'information', which a knowing mind may assimilate, understand, comprehend and incorporate into its own knowledge structures (Wilson, 2002). These structures are different for the person writing the message and the receiver, because each person's knowledge structures are biographically determined (Schutz, 1997). Therefore, the knowledge built from the messages can never be exactly the same as the knowledge base from which the messages were uttered. In a mobile IM environment, the volume of information exchanged via text instant messaging is relatively small. That is, learners' cognitive load is also reduced, since sharing of information is in small chunks. The meaning of the text in IM interaction is understood from a learning context (Ricoeur, 1991). In other words, knowledge is constructed when an IM text message is socially and contextually interpreted by the learner. The learner's perspective or thought process may be adjusted as an outcome of IM social interaction. This shift in knowledge, perspective and thought process constitutes knowledge transformation.

### **CONCLUSION**

Given that knowledge sharing is a location and time-independent human-to-human process, mobile instant messaging allows learners the awareness of available social resources that they may draw upon for consultation. In this paper I have suggested how social presence awareness could be used to support a mobile learner. The conceptual model is a knowledge transformation

environment that supports learners, continuously assuring them of consistent access to social networks and resources. I have also argued how ubiquitous social interaction through the use of a context-aware social presence mechanism could be employed to support a learner as he or she traverses learning contexts.

The social presence afforded by synchronous mobile instant messaging could successfully maintain social networks constituted for ubiquitous mobile learning and enable the kinds of interaction whose outcome is knowledge transformation. Thus, the model supports synchronous collaboration between geographically dispersed learners. The conceptual model also provides learners with reduced cognitive load. That is, learners do not have to remember or memorise volumes of information, since they are consciously aware of available social networks that could provide an on-demand small chunk of information for a specific learning task.

I approached mobile instant messaging in the context of a South African higher education environment, where personalised academic support is a growing need but delivery is fraught with challenges. Subsequently, mobile IM allows me to determine the local value it may bring to learning and knowledge sharing as well as its place among other forms of social and educational communication. A mobile IM environment may provide personalised academic support to disadvantaged or under-prepared learners in different ways. Its social presence indicator is relevant to selecting who among the peers (based on a shared background) is available for an opportunistic and on-demand social interaction. And finally, such learners are afforded access to knowledge resources and peer networks, regardless of time and their location.

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