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Using Web 2.0 as a tool to provide personalized learning support: the case of South African higher education

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Abstract

In a contact university, learners from diverse backgrounds face different challenges including the provision of personalized learning support. Most of these learners come from previously disadvantaged schooling systems where contact or one-on-one interaction with an instructor is unusual due to the poor faculty-to-learner ratio and scarce resources. With the existence of Web 2.0, there are opportunities to cushion those challenges faced by learners, by incorporating a personal learning environment. Using theories of social presence and connectedness as lenses, this paper, provides an informed understanding of the interactions (whose outcome is learning) provided by varied Web 2.0 tools. Supporting empirical evidence gathered at Tshwane University of Technology through a Contextual inquiry research methodology, this paper shows how Web 2.0 tools facilitate personalized interaction between learners, as well as personalized interaction between learners and instructors, to provide ubiquitous access to social resources and other learning resources. The evidence shows that different tools available in Web 2.0 creates a personalized learning environment for learners to interact, share knowledge and collaborate with those who are not in the same location. The use of Web 2.0 tools creates a culture of mutual support and collaboration among learners, which in turn strengthens the learner's skills in interacting with the instructors, tutors and peers. This paper reports on the feasibility and utilization of Web 2.0 as a personal learning environment (PLE). The paper addresses how learners control their learning pace and spaces by engaging Web 2.0 tools. In this paper, we argue that utilization of these Web based tools affords learners the necessary personalized support, in varied learning contexts.

Keywords

Web 2.0, personalized learning support, social presence, personal learning environment, knowledge sharing

1. Introduction

The problem for a contact university is that, although the assumption is that learning happens during class contact, learners do most of the learning outside the formal contexts. This is because, in formal context (scheduled class periods or laboratories), learning is mostly passive – the instructor delivers a lecture and learners passively participate. Learners begin to reflect on

the learning contents mostly in informal contexts, where they begin to realize some learning problems for which they need to consult. It is at this point that they need social presence of a knowledgeable peer or expert (Kekwaletswe, 2006).

Although learning is not confined to classrooms, learners do not always have access to social and learning resources as they move away from formal contexts (Kekwaletswe, 2007a). Since instructors are not always available for consultation, the alternative for these learners is to interact with peers, who often share a background (Kekwaletswe, 2006).

To the above point, this paper explores how Web 2.0 could be utilized to facilitate interaction between learners, as well as personalized interaction between learners and instructors, to provide ubiquitous access to social resources and other learning resources. A social resource is a knowledgeable peer, tutor or instructor who could provide personalized support (Kekwaletswe, 2007b). Using theories of social presence, activity and social cognitive, the study hopes to provide an informed understanding of the interactions (whose outcome is learning) provided by varied Web 2.0 tools.

It is envisaged that the understanding of appropriate Web 2.0 tools will help practitioners to reduce the higher education challenge of providing personalized learning support to learners with diverse backgrounds.

Web 2.0 has provided a version of internet experience that encourages individual users to upload, that is, to offer up their own contributions to a vast and interleaving exchange. This is implicitly contrasted with the former (Web 1.0) experience of the internet (Cook et al., 2008).

The affordances of Web 2.0 seemed to harmonise well with modern thinking about educational practice. In particular, they promise learners new opportunities to be independent in their study and research, by encouraging a wider range of expressive capability. It facilitates more collaborative ways of working and furnish a setting for learner achievements to attract an authentic audience. To encourage these possibilities, Web 2.0 tools have evolved to create distinctive forms of support for learning and for independent research in this new internet (Cook et al., 2008).

The focus of this paper is on how Web 2.0 tools could enhance personalized learning support, by identifying means that enable learners to interact with peers, who often share a background, while in varied learning contexts. In particular to alleviate the challenges experienced by learners in the South African higher education environment.

2. Background

2.1 Challenges in the South African higher education environment

In South African universities, learners come from very diverse backgrounds, with different languages and cultures. Most of these learners come from previously disadvantaged schooling systems where contact or one-on-one interaction with an instructor is unusual due to the poor faculty-to learner ratio and scarce resources (Kekwaletswe, 2006). Some of the reasons are:

- Learners not understanding the content presented during formal lectures.

- The 'fear' that learners have, for not being able to express themselves in the presence of other learners.
- Learners having difficulty writing and expressing themselves in the language of instruction - English as a medium of instruction as opposed to a local language.
- Instructors not always available to provide personalized support to learners outside the formal contexts (Kekwaletswe, 2007).
- Providing personalized academic support to under-prepared learners remains one of the prevailing educational challenges in South Africa (Jaffer et al., 2006).
- Learners not educationally ready for higher education environment

With the above mentioned reasons, it is therefore useful to distinguish between the learning contexts where a learner needs personalised support (Kekwaletswe & Nga'mbi, 2006). These are: formal contexts, semi-formal contexts and in-formal contexts.

Formal contexts, is whereby a learner's behaviour and action is shaped according to the university class timetable (e.g. scheduled lectures and laboratory sessions). In this context interaction is usually one-way from instructor to learner. Even though learners are invited to ask questions, there is little time to assimilate the material and meaningfully engage with the learning material (Ng'ambi, 2004). In this context, social presence is usually availed through wired PCs in the computer labs and the face-to-face presence of tutors, instructors and peers.

Semi-formal contexts: These contexts represent informal spaces on campus used by learners, usually while waiting for the next lecture to start or after it finishes (e.g. the library, cafeteria, mingling areas and walk-in laboratories). As learners begin to reflect on the previous lecture and skim through the learning materials, questions begin to arise for which clarifications are required (Ng'ambi and Hardman, 2004). In this context social presence is still availed through wired PCs in the computer labs and face-to-face presence of peers.

Lastly we have in-formal contexts: These contexts include working during after-hours or weekends at university residences, i-center, internet cafes or private homes. There are three things that must be known to provide ubiquitous personalized learning and knowledge support to a learner in an informal learning environment (Kekwaletswe, 2006):

- a) knowledge about the location of a learner so as to help identify the potential knowledgeable peer
- b) the preferred language of a learner in which he or she is likely to be conversant, and
- c) the awareness of a peer's social presence and contexts

This paper argues that Web 2.0 tools provide opportunities that could help reduce some of the above challenges. Providing personalized academic support to under-prepared learners remains one of the prevailing educational challenges in South Africa (Jaffer et al., 2006). An alternative channel that learners can explore is using Web 2.0 to provide personalised learning support as they move between the learning contexts.

3. Conceptual framework

3.1 Personal learning environment framework

In contrast to traditional LMS-driven e-learning solutions, a Personal Learning Environment

(PLE) takes a more natural and learner-centric approach and is characterized by the freeform use of a set of lightweight services and tools that belong to and are controlled by individual learners. Rather than integrating different services into a centralized system, the idea is to provide the learner with a plethora of different services and hand over control to her to select, use, and mashup the services the way she deems fit. A PLE driven approach does not only provide personal spaces, which belong to and are controlled by the user, but also requires a social context by offering means to connect with other personal spaces for effective knowledge sharing and collaborative knowledge creation (PLEF - online).

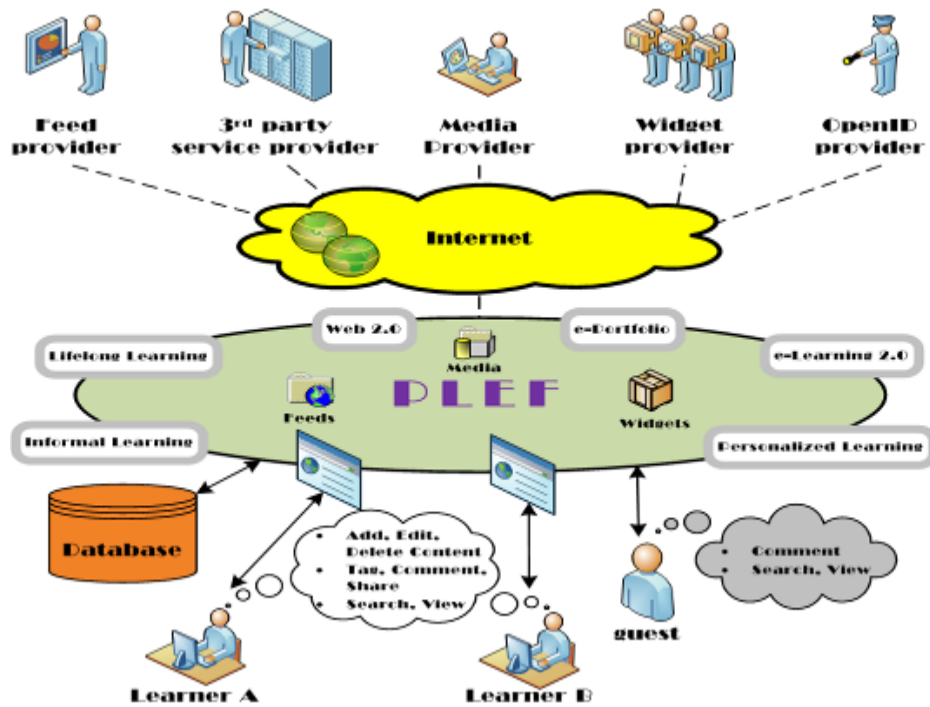


Figure 1: Personal Learning Environment framework (PLEF) - online

The Personal Learning Environment Framework (PLEF) supports the learners in taking control over their learning experience by aggregating, managing, tagging, commenting, and sharing their favourite resources (e.g. feeds, widgets, and different media) within a personalized space (PLEF - online).

3.2 Personal learning environments

There is a growing movement of academics (Sclater, 2008:6) who feel restricted by virtual learning environments (VLE) and are recommending to their learners a host of free web 2.0 systems hosted around the internet – carrying out teaching activities using these tools. Such a response (van Harmelen, n.d) has resulted in an increased perception that Virtual learning systems (VLEs) and Learning Management Systems (LMS) do not deal as well as they could with the needs of learners. Atwell (2007) further argues that such environments (VLE and LMS) can be pretty sterile places, with the tendency of reproducing previous forms of learning – the classroom or the university embodied in software.

Van Harmelen (n.d) briefly defines a PLE as a single user's e-learning system that allows collaboration with other users and teachers who use other PLEs and/or VLEs. In some sense a PLE must contain 'productivity' applications that facilitate the owner's learning activities. PLEs should be generally under the user's control as to use and personalisation. Attwell (n.d) states that a PLE can use social software for informal learning which is learner driven, problem-based and motivated by interest – not as a process triggered by a single learning provider, but as a continuing activity.

The idea of a Personal Learning Environment recognises that learning is continuing and seeks to provide tools to support that learning. It also recognises the role of the individual in organising their own learning. Moreover, the pressures for a PLE are based on the idea that learning will take place in different contexts and situations and will not be provided by a single provider (Attwell, 2007:2). In this instance, personalisation becomes a major attribute in providing a personalised learning support, meaning (Hilzensauer & Schaffert, 2008:5) to get information about learning opportunities and content from multiple communities and services fitting to the learner's interest.

Within PLE, (Hilzensauer & Schaffert, 2008:4) the active participation on (collaborative developed) content development, for example blog postings, contributions to Wiki pages or participation in discussion forums or commenting on Weblog posting from other community members, are the central idea of this new concept.

Milligan et al. (2006:2) suggested in their study that, in a Personal Learning Environment (PLE), the learner would utilise a single set of tools, customised to their needs and preferences inside a single learning environment. The tools would allow the learner to:

- Learn with other people: managing their relationships with tutors, and peers, as well as form links between contacts who are not part of their formal learning network.
- Control their learning resources: enabling them to structure, share and annotate the resources they have been given along with those they have found or created themselves, or been given by their peers.
- Manage the activities they participate in: providing them with the opportunity to set up and join activities such as study groups, bringing together a specific group of people, together with the appropriate resources.
- Integrate their learning: allowing them the opportunity to combine learning from different institutions, re-using previously generate evidence of competency or making links between formal and informal learning

Some authors see the Personal Learning Environment (PLE) as the sum of all used tools (e-mail, browser, websites and applications) but according to a majority it is a technological realisation where Social Software applications and Web services are combined. e.g. as mash-up in a single portal for the purpose of learning. PLE are Web sites or services where learners are able to produce learning content or reflections and sore documentations about their learning processes (e.g. Weblog postings). Furthermore, users should be able to aggregate data from their learning communities, e.g. through RSS feeds of interesting Weblogs (Hilzensauer & Schaffert, 2008).

The development and support for Personal Learning Environment would entail a radical shift, not only in how we use educational technology, but in the organisation and ethos of education. PLE's provide more responsibility and more independence for learners. They would imply redrawing the balance between institutional learning and learning in the wider world (Attwell,

2007:5).

The major issue is that, everyday, informal learning is disconnected from the formal learning which takes place in our educational institutions. For younger people there is a danger that they will increasingly see school as a turn off – as something irrelevant to their identities and to their lives. Personal Learning Environments have the potential to bring together these different worlds and inter-relate learning from life with learning from school and college (Attwell, 2007:4).

3.3 Web 2.0 in education

Virkus (2008) briefly states that the use of Web 2.0 technologies in higher education is still a new phenomenon and its integration into teaching and learning is still in the initial phase.

Within this context higher education refers to the environment of Universities and colleges.

While many people are beginning to make use of Web 2.0 technologies in learning and teaching, much of this is still experimental work carried out by enthusiastic lecturers who are willing to devote the time to make the technologies work for their teaching (Franklin & van Harmelen 2007).

Below are some of Web 2.0 technologies used in the educational environment (Franklin & van Harmelen, 2007:5):

3.3.1 Blogs

A blog is a system that allows a single author to write and publicly display time-ordered articles (called posts). Readers can add comments to posts. Educational uses:

- Teachers can use a blog for course announcements, news and feedback to learners as shown below in Figure 2.

3.3.2 Wikis

A wiki is a system that allows one or more people to build up a corpus of knowledge in a set of interlinked web pages, using a process of creating and editing pages. The most famous wiki is Wikipedia. Educational uses:

Learners can flag areas of the wiki that need attention, and provide feedback on each other's writing. Wikis can be used in class projects, and are particularly suited to the incremental accretion of knowledge by a group, or production of collaboratively edited material.

3.3.3 Social Bookmarking

A social bookmarking service provides users the ability to record (bookmark) web pages, and tag those records with significant words (tags) that describe the pages being recorded. Educational uses:

Teachers and learners can build up collections of resources, and with a little ingenuity can also

use social bookmarking systems to bookmark resources that are not on the web.

Group of users with a common interest can team together to use the same bookmarking service to bookmark items of common interest.

3.3.4 Media sharing services

These services store user-contributed media, and allow users to search for and display content. Besides being a showcase for creative endeavour, these services can form valuable educational resources.

Example, YouTube (movies), iTunes (podcasts and videocasts), Flickr (photos), Slideshare (presentations), DeviantArt (artwork) and Scribd (documents). Educational uses:

Podcasts can be used to provide introductory material before lectures, or more to record lectures and allow learners to listen to the lectures again, either because they were unable to attend, or to reinforce their learning. Podcasts can also be used to supply audio tutorial material and/or exemplar recordings of native speakers to foreign language learners.

Distribution and sharing of educational media and resources, e.g. an art history class could have access to a set of art works via a photo sharing system. Videcasts (video versions of podcasts) can be used to supply videos of experimental procedures in advance of lab sessions.

3.3.5 Social networking and social presence systems

These are systems that allow people to network together for various purposes. Examples include Facebook and MySpace (for social networking/socializing), LinkedIn (for professional networking), Second Life (virtual world) and Elgg (for knowledge sharing accretion and learning). Educational uses:

- The use of Elgg at the University of Brighton
- LinkedIn acts, at a professional level, as a model of educational use in the way in which it can be used to disseminate questions across the community for user seeking particular information
- IM (Instant Messaging) tools such as gtalk, mxit, Skype.

3.3.6 Collaborative editing tools

These allow users in different locations to collaboratively edit the same document at the same time. Examples are Google Docs and Spreadsheets (for text documents and spreadsheets) and Glimmer (for diagrams). Educational uses:

For collaborative work over the web, either edited simultaneously or simply to share work edited by different individuals at different times, creation of works of art or design across disciplines. For instance, architecture and interior design learners from different universities working together to complete a commercial brief.

4. Theories underpinning the research

4.1 Social presence and connectedness

In this study connectedness and social presence are key factors which could contribute towards providing the needed personalized learning support.

Social presence is understood to be the technology-mediated presence or the face-to-face presence of another learner who could provide personalized on-demand social support for a learning problem as the learner traverses varied learning contexts (Kekwaletswe, 2007:16).

The concept of connectedness is related to the concept of 'social presence', but it is not equivalent. Social presence is a judgment of the perception of the other participant and/or of the medium, whereas connectedness is an emotional experience, evoked by, the independent of, the other's presence (Rettie, 2003).

Biocca et al (2001), classified that connectedness relates to the sense of social presence, as psychological involvement, but does not entail perceived access to another intelligence or psychological presence. IM (Instant messaging) and text messages illustrate the difference between the social presence and connectedness. The awareness that others are online in IM conveys connectedness even when there is no message exchange; similarly, the exchange of 'goodnight' text messages creates connectedness.

Ijsselstein et al. (2003:927) proposes that the concepts of 'social presence' and 'connectedness' are complementary, arguing that in awareness systems the level of social presence will be very low, but the "sense of connectedness, the feeling of being in touch, can be strong". The issues of social presence and how learners use it to get help with a learning task will be investigated with respect to Web 2.0.

Social presence is a vitally important component of any learning situation, and doubly so in electronically mediated contexts (Wheeler, 2005).

5. Method of collecting empirical evidence

Empirical evidence was gathered at Tshwane University of Technology using contextual inquiry methodology. Holtzblatt and Jones (1994) define contextual inquiry as a field research framework that depends on conversations with users in the context of their work. It is based on ethnography, where the researcher goes into the research participant's own environment. Contextual inquiry consisted of observing learners' actions and talking with learners in their learning environment while they are engaged in authentic learning tasks (Kekwaletswe, 2009). This study ought to follow the same method.

In this study, 10 participants were learners from Tshwane University of Technology, who owned mobile phones which had the capability to access IM (Instant Messaging) were identified. Such devices were preinstalled with GPRS, therefore wireless connectivity was available when required. In situations where wireless connectivity was not available, participants had an alternative access to wired connectivity in labs and i-centers.

During the inquiry learners were observed while interacting with the different tools, at the same

time asked questions on why they were using those tools.

The following section will define how Web 2.0 provides this personalised learning support.

6. How Web 2.0 tools provide personalised learning support.

Learners in the South African Higher education are faced with different challenges. The personal learning environment in this context, allows the learners to use different tools, to be able to explore and customise their educational needs while they encounter the different challenges. In most South African universities, personal learning environment are influenced by the challenges faced by learners.

A scenario where a PLE can be formed is when a group of learners, who often share a background, interact and collaborate using one common language, since South Africa has 11 official languages. This usually occurs when learners have difficulty writing and expressing themselves in the language of instruction. In the South African Higher education environment, English is the medium of instruction.

A common challenge faced by most South African learners in higher education, is the 'fear' to engage in classroom activities. Learners lack motivation to participate in class, most of them being introverts, since the higher education environment is still new to them.

In addition to the above point, learners have the opportunity to use Web 2.0 tools to express and participate in educational learning, in order to cushion the effect of these challenges.

In this study, the following Web 2.0 tools were used to show how they provide a personalised learning support.

6.1 Blogs

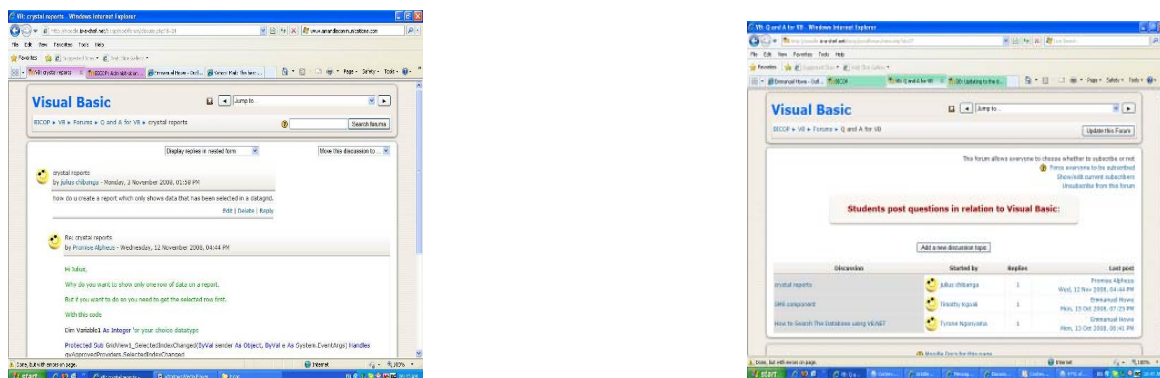


Figure 3: A personalised learning environment for a learner using a Web 2.0 tool

Figure 3 above shows how a learner has merely created a personalised learning environment, when using this tool. This in turn also gives instructors the opportunity to respond to these questions and view comments posted by the learners. While viewing and interacting with these learners, the instructor could be around campus or outside.

Challenges experienced by learners and how a Blog helps to provide the needed academic support

There are situations where the learner was faced with a problem and the instructor was not available to provide personalized support. The learner may also face difficulty understanding the instructor during class, and therefore being left behind. A Blog is then an alternative.

Why would this learner use this tool?

Remarks by learner

Learner, *" when im posting questions on this blog, I feel in control, meaning I know what questions to ask. The problem I have is that, when im in class, I tend not to grasp what the lecturer is saying. I only manage to understand what was said when im outside class and im able to recall some of the stuff that was being said when ii start posting questions."*

The learner saw the opportunity to use a blog because it provided means to collaborate and share knowledge with other learners, hoping to get an immediate response by posting these questions. This implies that the learner is more comfortable using this tool to interact, share and collaborate with other learners. Furthermore, this tool gives the learner confidence to control learning, control the learning pace, by seeking out answers from fellow learners.

What influenced the learner to post these questions?

Remarks by learner

(A 1st year student)

Learner, *" Most of the time I am usually on the net in the morning at the i-center (computer lab) and that has it easy for me to post and interact with my friends from class about the subject."*

The interaction between the learners is influenced by awareness of context and social presence. This mere presence awareness of other learners in this learning activity provides enough motivation for personal learning to transpire. The learner saw the presence of other learners, and was encouraged to continue posting the questions.

Remarks by learner

(A 3rd year student)

Learner, *" I went to see my lecturer this afternoon, and I did not find him in his office. This was*

the 6th time this has happened. I wanted to ask him a few questions on chapter 5, because I could not understand some of the concepts in the book. I then decided to post some of the questions on the blog to my fellow classmates. The reason why I used a blog is because it allowed me to post most of the questions.”

“I also felt that with using the blog, I would be able to get an immediate response from my classmates, as well as different answers, which will hopefully provide me with more clarity.”

6.2 Instant Messaging (IM)

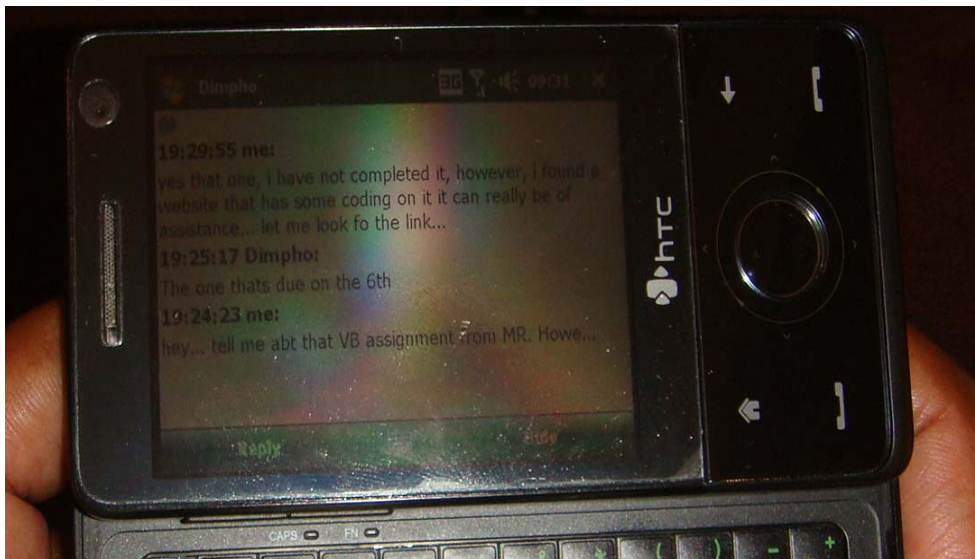


Figure 4: Educational interaction between learners

Figure 4 above shows a learner interacting with another learner, not in the same location, using a mobile phone. This situation, lies within the semi-formal context, whereby the learner is still waiting for the next lecture to start, or still in the presence of other learners, in a mingling environment. This figure also how the learner is able to control their own learning.

Challenge experienced by this learner

The learner probably did not understand the content presented during formal lectures, so she had difficult finishing up the assignment.

Why did this learner use this tool?

Learner,” *Since I am 3rd year learner, I do not have much time to go to the i-center or the labs, I tend to use my mobile phone because I can access Internet on the move. Can you imagine me running around looking for a computer to ask my friend when that assignment is due? Having my phone near me makes life even easier.”*

While still waiting for the next class to start, the learner suddenly remembers an assignment that has been giving her problems needs to be finished and submitted. At that moment, the learner uses her mobile phone to ask her classmate about the assignment, by engaging in a dialogue online.

How did the learner know that her classmate is online?

On the application, anyone who is online is shown by a green indicator. Offline users are indicated by a red indicator. The indicator, in this instance was a green dot next to the learner's name, which showed that the learner is available. This then allowed the interaction to commence.

Remarks by learner

Learner," *While waiting for the next class, I suddenly remembered that VB assignment which was giving me a hard time that I needed to finish up and submit. I took out my phone and logged on to Gtalk. I was happy to see my friend that she was online, so I quickly asked her about the assignment. Using my phone with Gtalk, allows me to be flexible, in the sense that I can communicate with my friends and classmates anytime I want. There is no need for me to be in school if I need to ask questions or when I would like to share something with my classmates"*

Using these tools has alleviated some of those challenges by providing the learners their own personal learning environment. Within this personal environment, learning continues in the different contexts, as well as active participation among learners. In each of these instances, the learner is able to control and organise their own learning, even outside the classroom environment. The perceived usage of these tools is that learners have the opportunity to fulfil their desired goals.

7. Conclusion

The challenges faced by learners in an academic environment can now be addressed by the using Web 2.0 to alleviate those challenges. The different learning contexts available allow learners the opportunity to explore them using Web 2.0 as a tool. The paper concludes that using Web 2.0 as a tool provides learners with the right attitude towards knowledge sharing, interaction and personalized learning support in an academic environment.

An important aspect of using the contextual inquiry method is that it presents real examples and scenarios as compared to models and frameworks. To provide a personalised learning support, social presence and awareness are significant since they have an impact on knowledge sharing and interaction among learners.

There is a great potential of using Web 2.0 as a tool to provide personalised learning support, but in instances where learners do not have the capability of owning or having access to wired and wireless connectivity, it limits those opportunities.

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