TITLE

The significance of Personal Learning Environments (PLEs) in nursing education: extending current conceptualizations.

ABSTRACT

Background:
Personal learning environments (PLE) have been shown to be a critical part of how students negotiate and manage their own learning. Understandings of PLEs appear to be constrained by narrow definitions that focus primarily on technological engagement with a range of web tools and associated applications. This paper addresses a gap in the literature around PLEs for students currently enrolled in undergraduate nursing degrees.

Purpose:
To provide in-depth insights into how undergraduate students of nursing manage and experience their learning.

Methods:
This was an international multi-site qualitative study, utilizing focus groups. A schedule of 10 questions and nominal group techniques were used.

Findings:
Whilst the focus groups took place in very different geographical locations, there were strong similarities in student understandings of effective PLEs. These went well beyond current technological definitions. Findings were organized into three major themes; technologies, learning modalities and influencing factors.

Discussion:
We propose a broader understanding of PLEs that acknowledges individual personal and cultural contexts which we call the personally significant learning environment (PSLE). There is a need for greater investigation of how students understand and systematize their PSLE.

Conclusions:
This paper and our findings will be of interest to educators, researchers and institutions for developing appropriate frameworks that may maximize learning outcomes, encourage cultural sensitivities and facilitate greater understandings of how to support students to create appropriate PSLEs.

INTRODUCTION

The global trend within the tertiary education sector is towards the inclusion of more online, multi-modal or external learning components (Robina & Anderson, 2010). Developing an understanding of student experience in learning and teaching in these changing environments and modes of delivery is essential to being able to provide contemporary high quality educational experiences. The Australian Bureau of Statistics (2012b) reported that 19% of students were enrolled in external multi-modal study in 2010; in the USA in 2007 33% of all higher education students were enrolled in at least one online course (Allen & Seaman, 2008); and in the UK 77% of universities were planning to expand their online course offerings (Higher Education Funding Council for England 2011). Valtonen et al. (2012) have argued that this is a natural progression from institutionalized Learning Management Systems (LMSs) which have traditionally been used for the dissemination of material and information, to Personal Learning Environments (PLEs) which aim to encourage more reflective, interactive and self-managed activities aligned with the development of meta-cognitive abilities (Mott 2010). The inclusion of a range of eBooks, eJournals, blogs and wikis as standardized within Virtual Learning Environments (VLEs) means there is greater attention to the design and use of these platforms to facilitate teaching and learning (Williams, Karousou & Mackness 2011). As such, this will continue to be a potentially huge growth area that promises better learning outcomes and greater student engagement (Anderson 2008). In this paper we argue there is a need for a broader lens and further research that investigates the way that this transition to more digital learning modes is experienced and managed by undergraduate students undertaking degrees in nursing.

BACKGROUND

The changing relationship between learning and technology

The VLE is the dominant institutional system used in education and follows a consistent model of integrating a range of software and data within a course or module (Wilson et al 2007). Typically VLEs have been institutionally controlled and work from the

assumption that learners will have a homogenous learning experience of 'a collection of loosely coupled tools, including Web 2.0 technologies, used for working, learning, reflection and collaboration with others' (Attwell 2010, np). However the hegemony of the VLE has been challenged by the recognition that PLE's provide greater opportunities for real world connectivity between formal and informal learning environments. Shaikh and Khoja (2014, p. 202) define a PLE as:

> 'an individual's online learning space premised on the personalization and openness offered by Web 2.0 tools and social media; a workspace which is conceptualized , built and controlled by learners in their quest to become self-reliant, connected, and lifelong learners.'

Digital technologies are a common feature of definitions of PLEs (Shaikh & Khoja 2014; Sangeetha 2016). Sangeetha (2016, pp. 86-87) presents PLEs as 'systems that help learners take control of and manage their own learning' which are 'interconnected in a digital ecosystem of media, tools and services'. Although, stating PLE occurs where digital and non-digital features are individually combined by learners, Sangeetha (2016) orientates discussion of PLE towards the integration and use of digital technologies.

PLEs are thought of as spaces in which individuals interact and communicate to develop collective know-how, through digital technologies (Shaikh & Khoja 2014; Sangeetha 2016). They are; learner driven, self-managed and problem-based. They are, therefore, an integral component of knowledge generation and sharing, providing a bridge between personal modes of study, institutionally sanctioned material and a social network of learners. From an educational perspective, the shift in focus from VLEs to PLEs represents a change in pedagogical approach (Johnson & Sherlock 2014). The trend has been to move away from traditional didactic teaching practices which are primarily teacher led to more learner-centered approaches which foster the development of critical thinking and problem solving skills (Wilson et al. 2009). As a result, Information and Communication Technologies (ICTs) have been adopted into many educational platforms at some level (Lee 2010) underpinned by a theoretical

commitment to social constructivism (Sturm et al. 2009). While in theory PLEs provide a platform which can facilitate the shift to more socially constructed forms of knowledge, there are a range of advantages and disadvantages that need to be fully considered. Nursing students learning settings are further complicated by the addition of practice elements of learning which may influence their PLE.

The adoption of ICTs

One of the main advantages associated with the explosion of internet technologies is that they initially overcame some of the constraints of time and space in traditional learning environments. Learning became more accessible as students could access content from elsewhere at any time of the day or night. The dissemination of educational content online has provided greater accessibility, however, there are arguments that VLEs have done little to challenge institutionally controlled learning pathways (Camacho & Guilana 2011).

Within the educational setting, the increased ownership and use of mobile technologies combined with access to social media software and networking sites has meant that access to knowledge has been greatly enhanced. This has led to the realization that even when students are physically present in institutions much learning occurs outside of formal situations through more social forms of knowledge sharing (Collins & Halverson, 2010). Students have learnt to be in charge of their own technology and consequently their own learning rather than relying solely on institutionally sanctioned Web 2.0 tools. In some UK universities the use of blogs to promote and publish material by both staff and students piggybacks the social trends for interactive social networking sites (Attwell 2007). Blogs, photo and video sharing and wikis have been implemented to facilitate group learning (Laru, Naykki & Jarvella 2012). There is, however, a generational difference in the acceptance of seamless integration between personal and educational digital experiences (Sharpe et al., 2010).

Opinions regarding the use such technologies in learning spaces are diverse. Indeed, annual surveys in the USA consistently illustrate that just over half of undergraduate university students (59%) still appreciate face to face learning opportunities and expressed no desire to increase online course content or activities (Smith, Caruso & Salaway 2009). However, online courses can be run successfully for nurses achieving high satisfaction rates (Segal et al 2013). This suggests that VLEs differ substantially from PLEs with advantages and disadvantages for individual learning outcomes.

The emergence of the PLE

There is a precarious balance between formal institutionally controlled learning environments (VLEs) and more 'emergent' types of learning that are student controlled (PLEs). This might at first seem a simple matter of promoting more emergent forms of learning through PLEs as aligned with the philosophies of lifelong learning and challenging traditional power hierarchies, yet there are inherent complexities around this more interactive form of knowledge creation. For example, there is little consideration of individual learning styles when adopting particular web tools and technologies as components of the VLE. Tools and technologies are not style-neutral though this is not a common reflection or consideration in course design. Inherently all Web 2.0 tools are biased towards a particular learning style. For example, a cognitive model will provide an explanation that students will be expected to retain (recommended reading lists), a behaviourist model will reward or punish certain behaviours (quizzes, online virtual labs) or a constructionist model guides the student to find the answer for themselves (self-directed tasks). Valtonen et al. (2012) argue that PLEs require not only require a certain level of ICT skill but also an awareness of one's own learning style in order to be truly effective. Alongside this, Dabbagh and Kitsantas (2012) argue that not all students have the self-efficacy or regulatory skills to customize a PLE. Without strong feelings of competence students will be less likely to use technology and more prone to believing that it is difficult to use (Cazares 2010).

For the most part, PLEs are considered from an instrumental point of view which documents student and teacher engagement with a range of technologies. This includes

identifying types of software as appropriate or compatible with the VLE, or gauging levels of teacher led direction and control (Laru, Naykki & Jarvella 2012). Along these lines, Modritscher (2010) developed software that enables students to track their own online data management. In spite of this, Rahimi, Van den Berg and Veem (2015) have suggested that there needs to be more attention given to student support in order for them to control their learning. They suggest a shift from 'learning from technology' to 'learning with technology' which represents a significant change of focus that reinforces the pertinence of the PLE.

Nursing education and PLEs

Nurse education is particularly complex and varied in its pedagogical approaches. These approaches are diverse in their focus on teaching and learning of knowledge, technical skills and ethical conduct; often shaped in response to the emerging challenges of nursing practice (Pagnucci et al. 2015). Such pedagogical methods may be teacher centred (such as theoretical lessons, tutorials, modelling, modelling); or student centred (such as problem solving, problem based learning, discussion, simulation, role playing, case studies, cooperative learning, project learning and brainstorming) (Pagnucci et al. 2015). Key to nursing education also are clinical learning environments, such as workplace experience placements and the clinical simulation laboratories, where skills and knowledge are applied to patient care (Flott & Linden 2015).

These methods occur within nursing education which has increasingly embraced a constructivist approach to designing pedagogy – where learning is viewed as something that individuals can construct and students learn to be and are supported to be responsible for their own learning (Chambers, Theikotter & Chambers 2013). Pagnucci et al. (2015) argues that better integration of learning approaches during nursing education could provide a response to the fragmented state of knowledge experienced by nursing students. We argue that first; to better support learning, understanding of the ways that students learn in nurse education is required.

There are few studies that investigate PLEs at the subjective level. We argue here that what is needed is a more comprehensive understanding of the various aspects and attributes of the PLE; one that acknowledges personal and cultural specificity. We agree with Williams, Karousou and Makeness (2011; np) who suggest that PLEs might better be considered as 'personal learning ecologies'. Here, they acknowledge that there are a range of external, contextual and personal factors that impact on the efficacy of learning through PLEs. The personal learning ecology is thus a pedagogical understanding of the relations between individual and their environment for learning. Similarly Shaikh and Khoja (2014, p. 203) argue that PLEs are more than just mechanically constructed content and customization technologies, but include 'social, emotional, cultural and deeply intrapersonal experiences'. Thus, examining the personal, social and contextual factors that influence PLEs will help to uncover more effective ways to integrate technology into the educational model (Selwyn 2010). Current definitions of PLE with the predominant focus on digital technologies do not address the varied ways of nurse learning. There is need for a broader understanding of how students learn in nursing.

METHODS

The aim of this study was to provide in-depth insights into how undergraduate students of nursing manage and experience their learning through a range of formal and informal components that comprise their PLE. It is a sequential exploratory project that incorporates two key phases of study (referred to as Phase 1 and Phase 2). The project is an international multi-site study, occurring at five institutions: University of Wollongong, Australia (investigators: CP and MS); The Hong Kong Polytechnic University (investigator: VC); Canterbury Christ Church University, England (investigator AMP); Robert Gordon University, Scotland (investigator: FW); and Dalhousie University, Canada (investigator: ESG).

The focus of this paper is the Phase 1 study. Findings from the Phase 1 study will inform the development and piloting of a survey (Phase 2). The Phase 1 study took place at four universities. Data were collected through focus groups held at the University of Wollongong; The Hong Kong Polytechnic University; Canterbury Christ Church University; and, Robert

Gordon University. The Phase 2 study will include the addition of Dalhousie University to provide a site independent of Phase 1 for survey validation.

Recruitment of participants at each site was purposive and continued until data saturation was reached. Emails, flyers and invitations on elearning sites were sent by investigators to students at each facility. For inclusion, participants needed to be undertaking an undergraduate nursing program at their respective institution. There was no restriction regarding which year of study students were in.

Face to face focus groups were facilitated by investigators. All groups were conducted in English except Hong Kong where the spoken language was Cantonese (a dialect of the Chinese language). Verbatim transcription from digital recording of the focus groups was performed in Chinese for analysis in the beginning (by investigator VC) before team meetings. Translation of the transcripts into English before data analysis is inappropriate because there will be inevitably a certain degree of loss of meaning from the language translation.

To ensure a standardised approach across sites, participants of each focus group responded to a set schedule of 10 questions designed by the investigatory team to elicit information around their conception of PLEs (see Table 1: PLE Focus Group Questions and Activities). The questions were generated from the existing literature. Nominal group techniques were also used to enable participants to consider their experiences and components of their PLE (questions A1, A2 and A3 in Table 1). Participants individually generated and recorded ideas onto sticky notes and then discussed and themed the ideas as a group. Participants also created visual representations of their PLE in the form of a sketch or conceptual map. The themed sticky notes and visual representations were photographed and stored for subsequent analysis. The research team were motivated to employ this approach because of the belief that current definitions of PLEs were constrained by a narrow focus on the technological challenges and befits of online learning systems.

Data were checked with participants during the focus groups. Facilitators sought clarification using the usual techniques of probing for further understanding and clarification and by using the group's members own words.

Table 1: PLE Focus Group Questions and Activities

[Insert Table 1 here]

Ethical Considerations

Ethical approval was obtained at each individual study site prior to the commencement of study. Ethical approval at each site included the formation of a Participant Information Sheet that outlined clearly that involvement, non-involvement and/or withdrawal would not impact the relationship between participant/student and learning institution. Furthermore, formal consent obtained from participants indicated they were aware they could withdraw from themselves are their data from the study at any time without impacting their relationship with the learning institution. Process consent ensured that participants were asked again at the time of focus group and affirmed their consent. All data collected was anonymised and stored securely as per local requirements.

Data analysis

A vast amount of data was collected and this was thematically analyzed independently by the investigator(s) of each site. Analysis was conducted with conventional content analysis through coding. This initial analysis was at the broadest level of abstraction in order to identify main emerging categories. Each site compared data and emerging findings for the development of shared analytic ideas and eventual consensual categorisation of themes. To ensure rigour, investigators, via a series of meetings through voice over IP (VoIP) technologies, met to discuss emergent findings. Any differences in emergent findings and themes from each site analysis were discussed, debated and resolved in these team meetings. The group met in Adobe Connect space and used an electronic whiteboard to facilitate this process. This process concluded when team consensus regarding the final thematic findings were reached.

FINDINGS

Eight groups totalling 46 students took part in focus groups. Some had not heard of the term PLE, others had encountered the term before but included several components that went well beyond current technological definitions. Whilst the focus groups took place in different locations worldwide, there were similarities in student understandings of effective PLEs. Image 1 provides an example of group theming (questions A1 and A2) from Canterbury Christ Church University. The findings from the focus groups were organized into three major themes; technologies, learning modalities and influencing factors.

Image 1

[Insert Image 1 here]

Technologies

The physical items and devices, and computer-generated programs and software participants used for learning were organized under the theme of 'technologies'. Two sub-themes were identified under this theme; hard, and virtual. Hard technologies referred to the vast array of physical items or devices participants use, including; mobile phones, notebook computers, desktop computers, computer tablets, headphones, pens and other stationary, books, journals, newspapers, audio tapes, audio recorders, dvds, flash cards, and note pads. Virtual technologies included computer-generated things such as the Internet and websites, virtual learning environments, and software, programs and applications, whether connected to the Internet or not. Virtual technologies had a larger role in participants PLEs than hard technologies. Identified were the virtual technologies that universities expected students to use, and the virtual technologies that participants chose themselves to use.

When discussing the virtual technologies universities expected participants to use as students, participants identified specific elearning programs and online spaces that acted as VLEs by storing and hosting learning materials and activities. Participants also identified virtual technologies such as student discussion forums, student blogging spaces, electronic readings, file storing drop boxes, and library catalogues.

The virtual technologies that participants chose themselves to use for learning included a range of Web 2.0 tools, social networking sites, search engines and image and video hosting services were identified, such as; Facebook, Google, YouTube, Twitter. Participants from all study sites chose such virtual technologies due to personal preference, peer preference, the accessibility and reliability of the technology and the fact that these technologies allowed for customization of learning. They regularly spoke of their preference for these virtual technologies, over those assigned by their universities and thus incorporated them into their PLEs more often and more broadly. One participant from the University of Wollongong identified virtual technologies allowed for an 'enhanced learning environment', through the personalization of learning, repeat viewings of material, ease of access to information and engagement in a relaxed setting.

Participants used these personally chosen virtual technologies when learning for general interest, but also integrated the technologies into their PLEs for university study. Virtual technologies were used to promote communication and collaboration amongst peers and to access extracurricular resources so to better understand university study. For example, participants of the University of Wollongong discussed their use of video hosting service YouTube for its accessibility and vast range of informative videos on a variety of topics. These participants explained that as nursing students they would use YouTube videos related to topics from university study to broaden their understanding of the subject matter. Accessing digital spaces for learning after using hard technologies was stated to provide 'completeness' and 'closure' in learning.

Learning Modalities

Findings indicate PLEs are influenced by individual learning preferences and the particular teaching contexts individuals engage with. The different ways of learning expected of, or preferred by participants, as well as the different approaches to teaching they experience, were organized under the theme 'learning modalities'.

Participants of each study site discussed that the ways they were expected to learn at university, including the activities and approaches, and technologies, did not always suit their personal learning preferences. Participants identified that they experience a range of teaching methodologies in nursing studies. For example, participants engage in face-to-face lectures, online video and or audio-recorded lectures, tutorial classes, student led study sessions, workplace experience, simulated clinical experience, individual and group assessment tasks, group activities and individual study. How each individual responds to these methods is dependent on their learning preferences.

Personal preferences in ways of learning were a clear finding across all study sites. Participants discussed where, when and how learning best occurred for them, often highlighting considerable differences among individuals. Individual preferences of learning methods were wide ranging and individual. Participants provided examples of how they preferred learning through methods such as listening to someone talk, discussing or debating topics, watching someone else perform a task, watching educational videos, writing and note-taking, practicing skills, reading books and journal articles on a topic, developing or engaging in learning activities, listening to audio recordings on a topic, and learning with or from peers.

A frequent focus of participants was that communication and the opportunity to interact with others was important for their PLEs. Participants from Canterbury Christ Church University, for example, identified that interacting and socializing with people from different fields of learning, including practice settings, and/or different cultures, as important to learning; for example " when we are in practice we do work with our mentors and other staff members so we try to ask everything". Communication and the opportunity to interact with others was identified as crucial

enough to learning that participants as students of nursing often shaped their PLE to include this. Of particular importance to participants from Robert Gordon University was peer support. Personal learning environments at this study site were identified to be particularly effective when it included peer support. As well as the integration of virtual technologies to promote communication amongst peers, participants at each study site ensured communication between peers with the use of study groups, seminar groups and classroom discussions.

Influencing Factors

Correlated findings from the study sites indicate that an individual's PLE is affected and shaped by external, interpersonal and intrapersonal factors. A PLE is influenced by these factors individually and by the interplay between factors.

External factors include the physical, built aspects of the environment, as well as the learner's ambient environment. Participants again discussed individual preferences related to both. With regards to the built environment participants identified the importance of room structure and furniture layout, having a good desk and desk chair, having the correct light, computers that work and working in sunshine. Some individuals preferred learning in public places, while others identified their most effective PLE included studying in a private place. To quote one participant from the University of Wollongong, a PLE is 'how an area needs to be' for the purposes of learning. Participants from Robert Gordon University identified a PLE as 'where ever you learn best'; with one participant describing it as a 'study nest'. One participant from Canterbury Christ Church University described a PLE as 'your own comfortable learning space'.

Participants preferred a physical environment that promoted an ambience suited to their learning. For some, the preferred built environment was a library, whereas others preferred a café. One participant from the University of Wollongong focused on the importance of listening to music from an internet streaming service while

studying. The student would listen to the music through headphones as a way to engineer his ambient environment to bring about his desired mental state for study.

According to participants, effective learning was often dependent on intrapersonal factors. Attitudes, preferences and emotions of the learner ultimately affect motivation and an individual's outlook towards learning. In describing the internal influence on learning, one participant from Robert Gordon University described a PLE 'gets [them] in the zone' to learn. Participants of Hong Kong Polytechnic University identified 'relaxation activities', such as leisure time and listening to music, as important influences for an effective PLE. For example,

> *I think this term [PLE] also means some personal habits, that's about* learning. When doing revision, some people like to listening to music when reading, or doing *revision. So that's apart from the physical environment, it can possibly be the own* preference for what the environment is, personal habits, and the way he/she likes it. *That's about many things that work together.*
>
> Participant 1 of Hong Kong Polytechnic University

Intrapersonal factors influenced not only a participant's attitude towards learning and motivation to learn, but also shaped their approach, engagement and interaction with learning modalities, technologies, and other influencing factors. For example, with technologies, some participants identified that they preferred to learn by using hard technologies such as books and journals and found that using virtual technologies could be a distraction. Others discussed their PLE as including 'laptops with so many tabs open' and 'multiple devices open at one time'. A participant from Canterbury Christ Church University described moderating their PLE in response to getting to know themselves:

> *basically I used to use too many resources. I've now learnt t*o prioritise which resources and relevant and which ones are important. We had that library workshop at the beginning of the year which really helped
>
> Participant of Canterbury Christ Church University

Interpersonal factors also played a significant role in participants PLE. Findings highlight this factor is interrelated with elements discussed in the themes of technologies and learning modalities. How and where participants communicated with others for the purposes of learning, and who they communicated with, was a significant focus across each of the study sites. Again, personal preferences were clear. Participants from Hong Kong Polytechnic University identified PLE as a personal space that does not only allow face-to-face interactions and communication, but the discussion through creative means like virtual technologies. For example, a participant pointed out that:

> Tools used to share things are actually simulation for your sensation. You think about creativity, and *you've* got a strategy for learning. For example, online *game is a platform. You've got a strategy of using such a platform for you to* communicate with people. So learning is not just from books. With someone else *you communicate with as such, you may even learn how to 'knock out'* other people.
>
> Participant 2 of Hong Kong Polytechnic University

DISCUSSION

Personally Significant Learning Environment

Participants of the study conceptualized a broader understanding of PLE than currently exists. A PLE was portrayed as learning setting in which a learner balances the interplay of many elements, be they technologies, methods of learning, and other influencing factors, with the goal of creating a space to learn effectively. The resources, technologies and methods which learners engage with may be prescribed by learning institutions; but ultimately, a PLE was a space with personal meaning and significance to the learner and supports their pursuit of educational goals.

Current definitions of PLE do not capture the broader understanding identified by this study. As such, this paper proposes a new term based on the study findings: personally significant learning environment (PSLE). A PSLE is an individual's learning state based on the inclusion, exclusion and interplay of learning modalities; intrapersonal, interpersonal and external factors; and, technologies (see Image 2). It is a pedagogical understanding of the relations between the individual and environment, for learning. This model is different from understandings of PLE in that is sensitive not only to technological components but also recognizes the material, emotional and social elements to students' understanding of an effective learning space. The challenge for developing a PSLE is for the learner to personalise and define the setting.

Image 2

[Insert Image 2 here]

Technology has fundamentally changed how we interact with the world; it blurs the boundaries between home and workspaces (Laurier 2004) through overcoming the limitations of time and space and allowing people to connect with other people and places near and far. Technological objects have the ability to evoke emotions and alter how we might understand ourselves and our place in the world (Turkle 2007). Thus, in an effort to provide a more comprehensive understanding of PLEs this project aimed to investigate the ways that nursing students utilized technology, as well as material environments, embodied and emotional states in ways that constituted personally significant learning environments**.** Rather than examining technology as a separate and/or sole entity related to learning environments, we endeavoured to examine the ways that it is woven into the everyday practices and environments of current students of nursing paying particular attention to subjective or cultural differences. Image 2 is our conceptual model of PLEs based on the initial findings of this study.

This conceptual model may have links with Fleetham's (2006) work on multiple intelligences. The PSLE may reflect the various intelligences that students use to

understand material and experiences. Fleetham's (2006) work was designed for children so further discussion about its relevance in a nursing context is needed, but Sheahan et al (2015) have used a multiple intelligences teaching approach for clinical skills acquisition.

Another aspect that may link with our conceptual model is learning styles. A variety of learning styles have been recognised over a number of years and are described as 'habitual cognitive and affective behaviours which determine how each individual *interacts in learning situations or environments'* (Andreou et al 2014, p.363). How these influence the PSLE is unclear. Hallin (2014) suggests that learning styles may be important for students to be more conscious about their learning strategies, so a link may exist between what students find as significant to their personal learning environment and their individual learning style.

This study has highlighted the complex nature of PLSEs for nursing students, which agrees with Williams et al.'s (2011) view that there are external, contextual and personal factors affecting individual preferences. We particularly note the interpersonal elements that help students learn. Practice learning and the mentorship relationship are seen as vital (Warren 2010) but the link to the individual PSLE may not be recognised or capitalised upon; this is an area that may need more exploration so that a person's PSLE is congruent with the different domains of learning within nursing curricula.

There are limitations to this study that need consideration. The number of participants in this study was relatively small. A purposeful convenience sampling technique was used which aids ease of access but may lead to bias as those volunteering may have a particular view to present (Moule & Goodman 2009). The research team analysed their own sites data initially before agreeing concepts via consensus. Consensus techniques are seen as positive for areas where there is little understanding (Moule & Goodman 2009) but there is a risk of excluding important but small details.

CONCLUSION

In an effort to provide a more comprehensive understanding of PLEs this project aimed to investigate the ways that nursing students structured their learning environment**.** By presenting findings from the first phase of a study into nursing student's effective learning experience, this paper has challenged the dominant understanding of PLEs to suggest a more nuanced understanding of the personal learning experiencing of nursing students. The paper has presented a conceptual model that opens up opportunities for further investigation into the learning environment of students. By introducing the PSLE more effective ways may be developed to support student learning. This is a rich area for further research, with opportunity for other scholars and educators to consider the possibilities of this novel approach. Investigators of this study will use these findings in order to develop a survey to further explore PLSE of nursing students.

REFERENCE LIST

Allen, I. E., & Seaman, J. (2008). Staying the Course: Online Education in the United States, Sloan Consortium (Sloan-C), Needham, MA

Anderson, T. (2008). 'Toward a Theory of Online Learning', in T. Anderson & F. Elloumi (eds.), Theory and practice of online learning (2nd ed.), Athabasca University Press Edmonton.

Andreou, C., Papastavrou, E., Merkouris, A. (2014) 'Learning styles and critical thinking relationship in baccalaureate nursing education: a systematic review'. Nurse Education Today. vol 34 (3) pp. 362-371 doi:10.1016/j.nedt.2013.06.004

Attwell, G. (2010), Personal learning environments and Vygotsky, Retrieved September 17, 2015, from http://www.pontydysgu.org/2010/04/personal-learning-environments-and-vygotsky/

Attwell, G. (2007). 'The Personal Learning Environments - the future of eLearning?' eLearning Papers, vol. 2, no. 1, ISSN 1887-1542.

Australian Bureau of Statistics [ABS] (2012b), Year Book Australia, 2012, cat. number 1301.0, ABS, Canberra

Cazares A. (2010) 'Proficiency and attitudes toward information technologies' use in psychology undergraduates' Computers in Human Behavior,,vol 26, pp. 1004-1008

Chambers, D., Theikotter, A. & Chmabers L. (2013), Preparing student nurses for contemporary practice: The case for discovery learning, Journal of Nursing Education and Practice, 3, 106-113

Collins A., & Halverson R. (2010). 'The second educational revolution: Rethinking education in the age of technology', Journal of Computer Assisted Learning, vol. 26, pp. 18-27

Fleetham, M. (2006) Multiple Intelligences in Practice. Stafford: Network Continuum Education

Hallin, K. (2014) 'Nursing students at a university – A study about learning style preferences'. Nurse Education Today vol 34 (12) pp. 1443-1449

Higher Education Funding Council for England (HEFCE) (2011). Collaborate to compete: Seizing the opportunity of online learningfor UK higher education: Report to the Higher Education Funding Council for England (HEFCE) by the Online Learning Task Force, Retrieved 17/09/2015, from http://www.hefce.ac.uk/pubs/year/2011/201101/

Johnson, M. W.& Sherlock, D. (2014). 'Beyond the Personal Learning Environment: attachment and control in the classroom of the future', Interactive Learning Environments, vol. 22, pp. 146-164.

Laurier, E. (2004). 'Doing Office Work on the Motorway', Theory, Culture & Society, vol. 21, pp. 261-277

Laru, J. Naykki, P and Jarvela, S. (2012). 'Supporting small group learning using multiple Web 2.0 tools: A case study in a higher education context', Internet and Higher Education, vol. 15, pp. 29- 38

Lee, M. (2010). 'Schools and the digital technology: An overview', in M. Lee & G. Finger (eds.), Developing a Networked School Community: A Guide to Realising the Vision, ACER Press, Camberwell, Australia, pp. 33-50.

Mott, J. (2010). 'Envisaging the post-LMS Era: the open learning network', Educause Quarterly, vol. 33, pp. 1528-5324

Moule, P., Goodman, M. (2009) Nursing Research: An introduction. London: Sage Publications Ltd

Pagnucci, N., Carnevale, F.A., Bagnasco, A., Tolotti, A., Cadorin, L. & Sasso, L. (2015), 'A cross-sectional study of pedagogical strategies in nursing education: opportunities and contraints toward using effective pedagogy', BMC Medical Education, vol. 15, pp. 1-12

Radloff, A. & Coates, H (2011). 'Introduction', in A. Radloff (ed.), Student engagement in *New Zealand's universities,* Australian Council for Educational Research and Ako Aoteaora, pp. v-xv

Robina, K., & Anderson, M. (2010). 'Online teaching efficacy of nurse faculty', Journal of Professional Nursing, vol. 26, pp. 168-175

Segal, G., Balik, C., Hovav, B., Mayer, A., Rozani, V., Damary, I., Golan-Hadarin, D., Kalishek, S., Khaikin, R. (2013) 'Online nephrology course replacing a face to face course in nursing schools' bachelor's program: A prospective, controlled trial, in four Israeli nursing schools', Nurse Education Today vol 33 (12), pp. 1587-1591
DOI: 10.1016/j.nedt.2012.12.009

Selwyn, N. (2010). 'Looking beyond learning: Notes towards the critical study of educational technology', Journal of Computer Assisted Learning, vol. 26, pp. 65-73

Shaikh, Z.A. & Khoja, S.A. (2014). 'Personal learning environments and university teacher roles explored using Delphi', Australasian Journal of Educational Technology, vol. 30, pp. 202-226

Sharpe, R., Beetham, H., & de Freitas, S. (eds.) (2010). Rethinking learning for a digital age: How learners are shaping their own experiences. Routledge, London

Sheahan, L., White, A., Bloomfield, J. (2015) 'An exploratory trial exploring the use of a multiple intelligences teaching approach (MTA) for teaching clinical skills to first year undergraduate nursing students'. Nurse Education Today vol 35(12) pp. 1148-1154

Smith, S.D., Caruso, J.B. & Salaway, G. 2009 The ECAR study of undergraduate students and information technology, EDUCAUSE, Retrieved September 17, from http://net.educause.edu/ir/library/pdf/EKF /EKF0906 .pdf

Sturm, M., Kennell, T., McBride, R., & Kelly, M. (2009). 'The Pedagogical implications of Web 2.0'. in M. Thomas (ed.), Handbook of Research on Web 2.0 and Second Language Learning Hershey, PA, pp. 367-384.

Turkle, S. (2007) Evocative objects, the things we think with, MIT press, Cambridge, Massachusetts

Valtonen, T., Hacklin, S., Dillon, P.,Vesisenaho, M., Kukkonen, J., & Hietanen, A. (2012) 'Perspectives on personal learning environments held by vocational students, Computers & Education, vol. 58, pp. 732-739

Warren, D. (2010) 'Facilitating pre-registration nurse learning: a mentor approach'. British Journal of Nursing. Vol 19 (21) pp 1364-1367

Williams, R., Karousou, R & Mackness,. J. (2011). 'Emergent Learning and Learning Ecologies in Web 2.0', The International Review of Research in Open and Distributed Learning, vol. 12, pp. 39-59.

Wilson, S Liber, O. Johnson , M. Beauvoir, P, Sharples, P. and Milligan, C. (2007). 'Personal Learning Environments: Challenging the dominant design of educational systems', Journal of eLearning and Knowledge Society, vol. 3, pp. 27-38

Wilson, S., Liber, 0., Johnson, M., Beauvoir, P., Sharples, P., & Milligan, C. (2009). 'Personal Learning Environments: Challenging the dominant design of educational systems', Journal of e-Learning and Knowledge Society, vol. 3, pp. 27-38