'First portal in a storm': A virtual space for transition students

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Abstract

The lives of millennial students are epitomised by ubiquitous information, merged technologies, blurred social–study–work boundaries, multitasking and hyperlinked online interactions (Oblinger & Oblinger, 2005). These characteristics have implications for the design of online spaces that aim to provide virtual access to course materials, administrative processes and support information, all of which is required by students to steer a course through the storm of their transition university experience.

Previously we summarised the challenges facing first year students (Kift & Nelson, 2005) and investigated their current online engagement patterns, which revealed three issues for consideration when designing virtual spaces (Nelson, Kift, & Harper, 2005). In this paper we continue our examination of students' interactions with online spaces by considering the perceptions and use of technology by millennial students as well as projections for managing the virtual learning environments of the future. The findings from this analysis are informed by our previous work to conceptualise and describe the architecture of a transition portal.

Introduction

When considering how to enhance the into-university transition experience for new students, it appears that a virtual learning environment (VLE) within a larger more encompassing managed learning environment (MLE) (JISC, 2000) provides a much needed opportunity for 'bridging the gap between academic, administrative and support programs' (McInnis 2003, p. 13). A VLE for students-in-transition would allow the many and varied interactions between the new student and their institution to be online, tailored and integrated.

Clearly, these environments must be designed to meet the challenges faced by transition (and particularly first year students) trying to navigate the unchartered waters of their new university experience. However, to be *effective, the technology harnessed to create these online spaces must be* aligned with the technology-use expectations of the dot.com generation or millennial students (Hartman, Moskai & Dziuban, 2005) *and* must be developed for delivery from a *student*-centred, rather than an *administrative*-centred, perspective. Critically, a MLE/VLE will need to cater for the one thing we know for certain about the diversity of transition students — 'that they come to us to learn' (Kift, 2004). While engaging in the social aspects of university life will engender a sense of belonging, and while timely access to support services can assist new students with their negotiation of administrative requirements, it is within the formal or academic curriculum that students must find their place, be inspired, excited, engaged and retained. Constructivist learning theory tells us that new knowledge is created when learners construct meaning from information in their environment and that the best learning occurs when it is contextual, active and social (Brown, 2005). Engagement in learning is the central critical tenet of successful transition; implying that student interactions with a MLE/VLE should be aligned with a constructivist philosophy that addresses learning needs and drives curriculum design.

Accordingly, our aim is to develop a virtual integrated learning space that provides curriculum-mediated, personalised access to academic resources, professional services and administrative support thus providing students with a holistic view of their university experience. The purpose of this paper is to provide an understanding of what this new integrated virtual environment needs to be and do. The framework we have used to guide this work is illustrated in Figure 1.
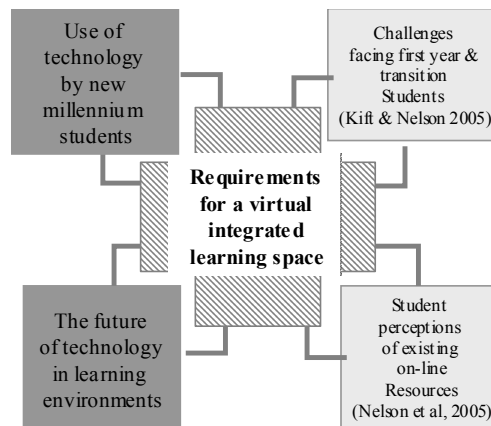

Figure 1: Paper concepts

In this paper, we first consider how students of the new millennium use and interact with information and technology and what their expectations are in this regard. We then integrate these findings with the three issues that emerged from our analysis of extensive survey data investigating how students experience online technologies (Nelson, Kift, & Harper, 2005). Finally, we summarise existing literature that discusses VLEs and visions for the learning environments of the future, with a view to conceptualising and describing the architecture of a first year portal.

Students of the new millennium

The lives of students of the new millennium (net.gen or dot.com) are characterised by ubiquitous information, merged technologies, blurred social-study-work boundaries, multitasking and hyperlinked online interactions. These characteristics epitomise dot.com generational routines, but do not exclude other generations who tend to adopt the same characteristics over time (Oblinger & Oblinger, 2005). In this section, we briefly examine the qualities of this generation of students, how they use and interact with technologies and their expectations of these technologies in support of their learning.

Prensky (2001) describes the millennial generation as digital natives used to the '"twitch-speed' of video games and MTV … [and] the instantaneity of hypertext, downloaded music, phones in their pockets, a library on their laptops, beamed messages and instant messaging' (p. 3). Clearly, the learning styles of these 18–22 year old students will differ from those of high school or adult learners (Oblinger, 2003); while Prensky (2001) further claims that digital immigrants (those not born into the digital age) have little appreciation of the skills digital natives develop during their formative years. Particularly, these net generation skills include preferences for:

- Receiving information fast and quickly;
- Parallel processing and multitasking;
- Networked environments;
- Random access (hypertext);
- Instant gratification and frequent rewards;
- Games over serious work.

(Prensky, 2001)

Even so, Oblinger and Oblinger (2005), referring to studies that indicate these characteristics do not indicate a preference for the fully online courses that satisfied the baby boomer generation (1946–1964), caution that tertiary institutions 'should not assume that more technology is necessarily better' (p. 2.11).

Windham (2005) describes how technology has irrevocably changed the lives of 'Net Geners'. For this generation, financial transactions (including banking and purchasing goods) are cashless, certainly cheque-less and often online. Typically, this cohort log on to the internet to problem solve or lodge customer service enquiries; use email to send simple messages, set up meetings and communicate with lecturers and friends; and would rather obtain information from the Web than read a paper newspaper or wait to listen to a radio or television broadcast.

When designing MLE/VLE systems for these students, attention also needs to be paid to individual technology communication preferences and how these students learn to use technology. Relevantly, Parker, Chignell and Ruppenthal (2002) used factor analysis to analyse data collected from a 62-item quantitative survey and identified six different factors to describe individual preferences for technology-mediated communication. Specifically, preferences were identified for: communications that are synchronous; scheduled; asynchronous; a 'constantly connected for collaboration' preference; general availability; and a preference for managing messages.

Recent Australian Technology Network (ATN) institutional survey data (Brown & Carrington, 2004) reveals that most students reported that they had '*worked out how to use [the technology] myself*'. Self-efficacy has been shown to be a valid measure of student computer knowledge (Karsten & Roth, 1998) and these self-assessments are supported by other research in this area. Most recently, Hoffman and Vance (2005) identified the computer literacy of new students and where, or from whom, they learned their technology skills. The key finding of their analysis of survey data collected online from 1340 new students was that students learn 'what they want to know', and they generally learn what they want to know informally. High levels of computer literacy were demonstrated for tasks that students 'want to know' about. These tasks included instant messaging, connecting to the Web, searching the Web and email. A taxonomy of technology tasks arising from this research classified these activities as 'native' tasks; where the authors defined native tasks as those learned informally, similar to the way a native language is learned.

While the characteristics of the net.gen or millennial generation are quite familiar, some attention is also due to how emerging technologies and the increased pace of technology convergence will influence how neomillenial students will learn. Dede (2005) identifies three technologies that will influence this next generation of learners: world to the desktop, multi-user virtual environments and ubiquitous computing. While world to the desktop is routinely used by current learners, new technology should be harnessed by specific learning design that draws more heavily on the pedagogy of situated learning to support immersive learning and augmented reality.

How students engage with existing online environments

This section summarises three issues that arose from the analysis of quantitative and qualitative data from one internal (the *QUT Technology Information and Learning Support (TILS) Survey*) and two externally administered national surveys of online teaching and first year students (the *ATN Online Learning Survey* and the *Centre for the Study of Higher Education (CSHE) First Year Experience Survey* respectively) conducted during 2004, which revealed patterns of online engagement for students at the Queensland University of Technology (QUT) (Nelson, Kift, & Harper, 2005). These issues, when considered together with knowledge about the complexity of the transition experience and our new understandings about *who* millennial students are and *what* their expectations might be of technologies, are discussed here to highlight the objectives of a managed virtual environment that aims to deliver curriculum-mediated resources and support to meet transition student needs.

The quantitative data (summarised in Table 1) reveal commonality in the demographic profile and in patterns of online interactions — access, satisfaction and time spent online — of the QUT student cohort. A scan of the qualitative data (discussed in more detail in Nelson, Kift, & Harper, 2005) serves to highlight further the similarity of students' online experiences. However for us, the most interesting findings are the qualitative data relating to the perceived benefits and existing constraints of online systems and the use made of them by millennial students. These findings clearly have implications for the design of virtual environments to support learning. Three issues emerge that have specific relevance to the architecture and design of a transition portal that seeks to tailor the delivery of curriculum-mediated resources within a virtual space. These three issues — students' preference for balanced learning environments, the use of real-time online discussion forums, and the desirability of providing a holistic view of institutional information — are now discussed.

Table 1: Summary of quantitative data

Category	Element	QUT TILS Survey	ATN Online Learning	CSHE First Year Experience
Student profile	Number	7784	5903	280
	Undergraduates	84%	85%	280
	Female	62%	57%	70%
	Age	71% (16–24yrs)	70% (16–25yrs)	20.6 yrs (mean)
	Full-time	-	81%	94%
	School leavers	-	-	74%
	Contact hours	-	11-15	15
Online access	On campus	91%	-	92%
	Off campus	98%	92%	94%
	Frequency	Most daily	Most daily	86% (weekly)
	Hours spent	2–10	6–10	5.3 (average)
	Satisfaction	72%	77% (at uni)	91% (useful)

Students prefer balanced learning environments

The first issue is that the QUT, ATN and CSHE surveys all indicate student preferences for balanced online and face-to-face contact. This preference aligns with comments made by North American high school (Oblinger & Oblinger, 2005) and university students (Roberts, 2005). Online access to course materials, information and other resources (particularly digital library resources) as well as administrative types of information were positively regarded. The ATN survey revealed students to be digital natives (self-taught users) (Prensky, 2001; Hoffman & Vance, 2005) in their online environment. However their usage focuses on obtaining or exchanging information from or with other students and staff outside of class time, or obtaining information to support their academic activities. These impressions also align well with views that current learning support systems are limited in terms of cross-institutional purposes and do not allow for vicarious learning (Neely et al., 2004). Overall, we can say that online systems are convenient, efficient, useful and effective information repositories that students use extensively to extend and complement face-to-face learning contact. However, it may be that, as suggested by Hirt and Limayem (2000), we should examine students' technology behaviours through the lenses of IT use and adoption models such as structuration theory, critical mass theory and social information processing models, to gain a better understanding about how and why students adopt and use technologies for learning.

Use of real-time online discussion forums

In light of these assumptions, it is particularly interesting to examine the data relating to online discussions that emerges as our second issue. In all three surveys reported on in this paper (QUT, ATN and CSHE) this functionality was not considered by millennial dot.com students to be at all well harnessed. This reality needs to be carefully considered when designing learning spaces for a generation of students locally characterised as 'electronic nomads' (Russell & Holmes, 1996), for whom IM (instant messaging) and SMS (short message service), email, and staying in touch — often accompanied by expectations of rapid responses (Prensky, 2001) and 'zero tolerance for delays' (Frand, 2003) — are socially embedded.

There has been considerable discussion in the literature about online learning communities of students and educators. Often the underlying technology for these communities is a discussion forum. Sheard (2004) describes online learning environments as usable places where the user is confident, safe, and possibly anonymous and peer supported; while educators in these spaces should model expected behaviours, monitor discussions and encourage interactions. Most of this commentary appears to focus on establishing, rather than maintaining, learning communities, and Sheard raises legitimate concerns about academic time commitments and managing high volume postings, before proceeding to recommend useful strategies for establishing and maintaining discussion forums.

However, they are designed, it is clear that these types of online communities will require both learners and teaching staff to adapt their behaviours to these communication mediums and/or to control their online availability, which may be at odds with the unrestrained interactions offered by these virtual spaces. Further, the teacher's role may also need to be agreed prior to establishing a presence in one of these spaces; for instance, models such as teacher-as-facilitator-of-discussion (following constructive principles) or teacher-as-information-provider (for efficiency and to meet students' needs for immediate responses). It may be that the tenets of constructivism and active learning would be better employed in a peer-to-peer network (where there

are no assumptions that one individual is the holder of the knowledge), where the exchanges are peer based and highly interactive, for instance in group work situations. On balance, it seems such functionality may well be suited to online learning where it is designed into curriculum activities rather than a as a bolt-on technology used to support more traditional approaches to learning.

Providing a holistic view

The third issue of interest to us, which came out strongly in the qualitative information collected in the QUT and ATN surveys, related to clarity of administrative and support processes and the ease of use of the institutional 'system'. Data in these categories seem to indicate a reasonable degree of unfamiliarity, or *not-knowing-about*, the administrative and academic processes underpinning the online systems: that is, there was unfamiliarity with, or a *not-knowing-what*, administrative support was enabled online and/or a fundamental *not-knowing-how* to use the online system to get the needed support or information. This should not come as a surprise given the size of some of our institutions and the requirements on students to interact with many different academic, administrative and professional structures throughout the course of their degree programs. Contemporary students have increasing levels of computer literacy (Stein & Craig, 2000) and will teach themselves how to learn new technologies (Hoffman & Vance, 2005); however these data indicate that a lack of conformity of information organisation, different interfaces and varied utilisations of online functionality create uncertainty in students as regards their use of technology to access services or information.

Managed and virtual learning environments

A managed learning environment (MLE) has been described as:

> A system that uses technology to enhance and make more effective the network of relationships between learners, teachers and organisers of learning through integrated support for richer communication and activities

> (JISC, 2000)

Virtual learning environments (VLEs) tend to refer more narrowly to the interactions between learners and users (a subset of the MLE). They are suggested by Clinch (2005) to support the following features:

- Controlled access to curriculum.
- Tracking of student activity and achievement.
- Support for online learning.
- Communication between online learner, tutor and support staff.
- Links to administrative systems.

Both terms are commonly used to refer to commercially available or open source software such as Blackboard and WebCT or OLAT and Moodle respectively, or in-house products (such as QUT's Online Learning and Teaching (OLT) system)), many of which have been around since the early 1990s. New technologies and technological convergence permits a wider variety of digital media to be used within VLEs. Crawley (n.d.) describes some of current e-learning tools that harness new technologies and a variety of media, such as TurboTurtle (Newtonian Physics); Habanero (allows distributed sharing of content using Java objects); and CyberEd (global distribution of images, sound and video for learning). However, existing and new VLE products focus on supporting and monitoring *learning* (only), whereas the survey data discussed above indicates that students in transition need an integrated holistic approach to both their learning *and the administration of* their learning experiences.

Clinch (2005) suggests widening the JISC description (2000) of an MLE to include other aspects of learning experience such as the timetabling system and library catalogue to enable 'seamless movement between … these systems'. Similarly, Hawryszkiewycz (2000) describes learning environments in terms of workspaces. He abstracts the concept of the workplace to describe any physical or logical structure (for example, a classroom or a repository of learning materials). The two main requirements of these learning environments are: (1) the organisational structure, relationships within it, and the tools to create the structure; and (2) the tools to create learning content and support for teaching and learning. According to this description, the role of the workspace is to 'bring together people, materials and facilities and the communications between them'.

Our conceptualisation of a MLE is informed by systems thinking, which is described by Kramer and de Smit (1977, p. 5) as a way of describing or thinking about the real world or resolving problems based on two premises:

- Reality is regarded in terms of wholes.
- Systems interact with their environments and are regarded as open systems.

Therefore, a 'systems thinking'-based MLE requires shared goals and objectives and encompasses:

- People: students, teachers, professional and administrative support staff.
- Processes: designed learning activities, learning administration and learning support.
- Information and data: learning materials, support materials and data required by students to monitor and administer their learning.
- Systems: e.g., a VLE, other learning software and systems providing access to resources.
- Information and communication technologies (ICTs): the hardware and networks required to support learning and communication processes, information storage and access.

Consequently, we have conceptualised the VLE as a part of an institutional wide collaborative approach to managing transition, which *together* form a MLE for transition students.

The three elements of this paper — characteristics of millennial (net.gen or dot.com) students; issues arising from recent studies of student use of current online environments; and a summary of learning environments and related pedagogy — inform the design of integrated and flexible virtual spaces that engage students in their learning, provide timely access to support and provide a sense of belonging. For the dot.com student, these spaces need to cater for a digitally savvy generation, whose environment is characterised by universal technology ownership, blurred social–study–work boundaries, ubiquitous information, multitasking and hypertext interactions (see Oblinger & Oblinger, 2005). The virtual spaces should also be used to balance online and real interactions, support social and learning interactions and provide a holistic experience.

We propose that integrated information architecture is necessary to provide such a holistic view of the university experience for students. This architecture will be implemented for first year students at QUT as a single online entry point, thus removing confusion about the *knowing where to* and *knowing how to* access online services and information. This first year portal will also allow both academic and administrative resources to be mediated through a curriculum-focused personalised interface. Importantly, our portal will also allow students to customise their interface and its contents to meet their individual content and technology-communication preferences.

Our proposed architecture is illustrated in Figure 2 and the key elements of it are described in the next section.

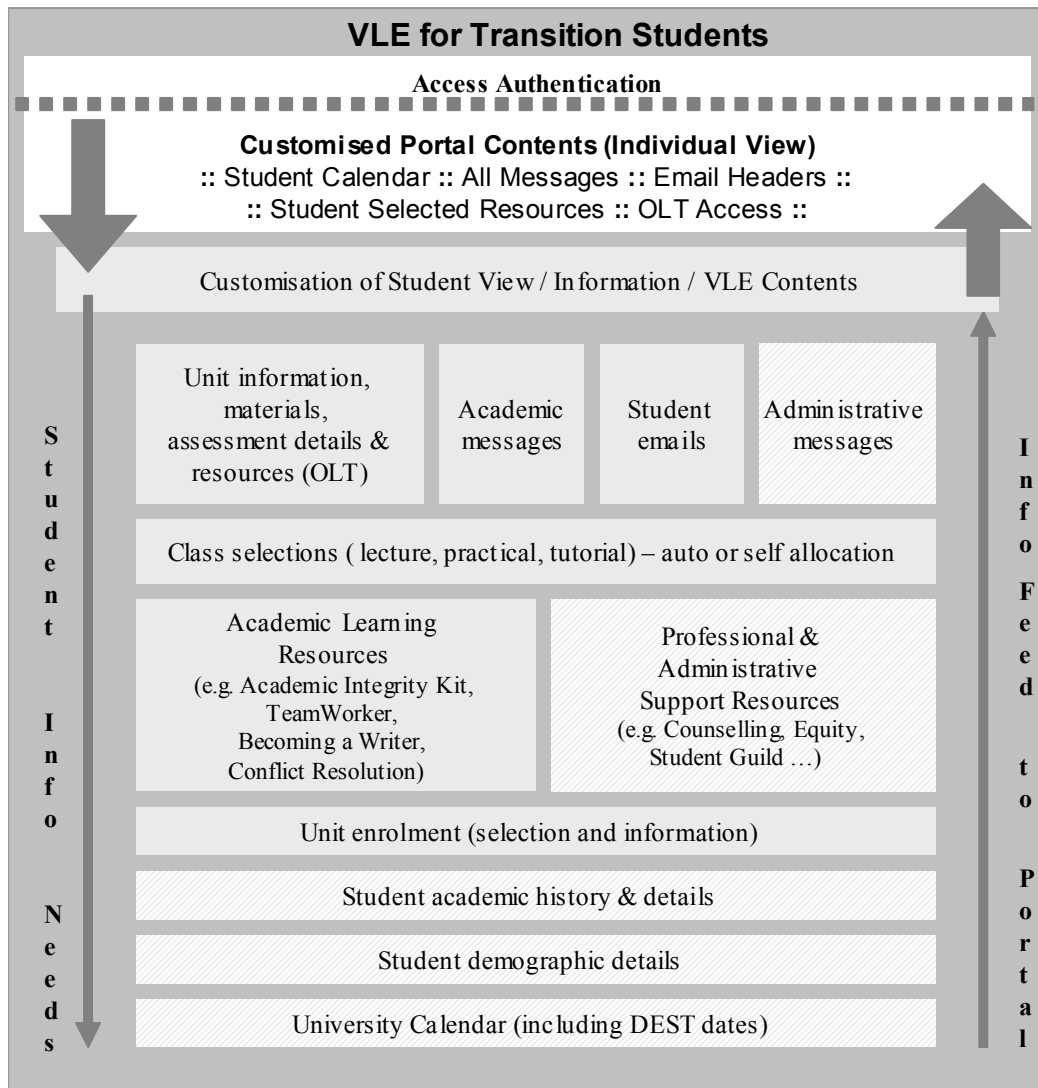## Conceptual architecture of the VLE for transition

Figure 2: Conceptual architecture for a transition portal

The transition architecture is founded on the holistic presentation of academic administrative information (such as class allocations and notices), academic learning needs (unit materials and resources, learning activities) and professional support services (such as counselling or academic learning support). The integration of content uses mass customisation that occurs during the user-authentication logon process. Entry of student logon details (arrow 1 in Figure 2) allows student information already held in corporate systems to be harvested (arrow 2) to create an individual portal for each student based on their academic details, self-identified resources, unit needs and information being pushed to them from professional, support and academic staff. Functionally, the portal has five key elements; each of these has drill down, store and archive capability:

- an individual student calendar

- a message portlet (unit specific academic messages as well as critical date administrative messages)

- access to student selected resources (e.g. discussion forums)

- direct access to our home-grown online learning environment, QUT's OLT system, for unit materials, resources and learning activities

- the most recent emails sent from a QUT address.

Conclusion

The design of this transition portal goes a long way to meeting the needs of digital native students navigating their new university experience. Particularly, it provides a personalised, one-world, view of *all* their potential interactions with the institution — academic, administrative and support — mediated through a web-based, digital interface designed with specific regard for the characteristics and skills of these students and their preferences for use and interaction with technology in support of their learning.

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