APPLICABILITY OF ONLINE TEACHING AIDS IN A SOUTH AFRICAN CONTEXT

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Abstract

Students currently at tertiary institutions have developed a set of attitudes and aptitudes as a result of growing up in an IT and media-rich environment. These attitudes and aptitudes influence how they learn. In order to be effective, lecturers must adapt to address student learning preferences and use the online teaching tools that these students are familiar with. In a South African context it was found that students spend a significant amount of time in interactive online image-rich environments and are accustomed to this environment. A number of suggestions are made on how to incorporate this in teaching.

Introduction

There is increasing evidence that students have developed a different set of attitudes and aptitudes as a result, at least partially, of growing up in an IT and media-rich environment. It is suggested that these students, who are characterised by their familiarity with and reliance on information and communication technologies, are part of the cohort of students currently studying at tertiary institutions. Studies have shown that there are identifiable characteristics and special needs of generations that influence how they learn and suggest that in order to be effective, lecturers must adapt to address the learning preferences of these students (Wessels & Steenkamp, 2009).

The group of individuals born after 1982, referred to as Generation Y, have grown up with extensive exposure to information technology. Generation Y students have spent their entire lives up to now surrounded by and using computers, digital music players, cell or smart phones and the other tools of the digital age. As a result of this environment and the extent of their interaction with it, Generation Y students think and process information in a way that is fundamentally different from their predecessors (Prensky, 2001). The learning preferences ascribed to Generation Y students are increasingly true for students across a wide range of ages, driven not only by the technologies they grew up with, but also by the tools and media they use every day. For example, by its very nature, the Internet rewards comparing multiple sources of information that are individually incomplete and collectively inconsistent. This induces learning based on seeking, sieving and synthesising, rather than on assimilating a single 'validated' source of knowledge as from books, television or a professor lecturing (Dede, 2004). While this may provide great advantages in areas such as the ability of students to use information technology and to work collaboratively, it may cause a disconnect

between their expectations and the learning environment they find at tertiary institutions. Prensky (2001) argues that the single biggest problem facing education today is that lecturers, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language.

Against this background, an online survey was conducted among students at a South African University to investigate their online practices and most frequently utilised online technologies in order to provide suggestions for in-class or educational use. It is important to understand which online technologies students use and how they use these technologies, in order to establish whether the teaching tools used in class be will effective and address students' learning preferences and attributes.

The Effect of Technology on Students' Learning Styles

Current academic literature attributes a number of very specific characteristics to Generation Y students. Generation Y students are described as confident, independent and individualistic, self-reliant and entrepreneurial (Martin, 2005) and at the same time socially active, collaborative, team-oriented and used to having structure in their lives as a result of the parenting they have received (Tapscott, 1998; Shih & Allen, 2007). Despite being independent they are seen as being emotionally needy and consequently constantly seeking approval and praise (Crumpacker & Crumpacker, 2007). In terms of work they are capable of multi-tasking quickly, are results-oriented and have an appetite for work and pressure (Shih & Allen, 2007).

Generation Y students are said to prefer receiving information and feedback quickly; to be adept at processing information rapidly (Prensky, 2001); to prefer multi-tasking and non-linear access to information (Frand, 2000); to have a low tolerance for lectures (Baron & Maier, 2005); to prefer active rather than passive learning (Brown, 2000); to rely heavily on communication technologies to access information and carry out social and professional interactions (Mitchell, 2003). It does not necessarily mean that these students want more technology in their education as they use this extensively in their personal lives.

Generation Y students therefore deal with information differently from previous cohorts: "They develop hypertext minds, they leap around" (Prensky, 2001, p. 4). A linear thought process is much less common. They have the ability to piece information together from multiple sources. However, research suggests that 60% of homework time on the computer overlaps with secondary activities (Foehr, 2006). This multitasking exists as a Generation Y student characteristic despite evidence that the concentration and retention capacity of the brain is compromised when more than one activity is introduced (Just et al., 2001).

Generation Y students have grown up with widespread access to technology and are able to intuitively use a variety of IT devices and navigate the Internet. They

are more visually literate than previous generations and are able to express themselves using images. Because of the availability of visual media, their text literacy may be less well developed than previous cohorts. Milliron (2008) found clear evidence that students' preferences are not well aligned with their long-term interests, and that the majority of students who graduate from colleges lack the functional skills historically associated with a bachelor's degree. Reading and focus are vital aspects of life-long learning and highly correlated with professional success. In the USA it has been reported that only 31% of students with bachelor degrees demonstrate a literacy level adequate to compare viewpoints after reading two newspaper editorials (NEA, 2007). The deterioration is worst among Generation Y students, with two-thirds lacking 'active reading habits. Even when reading does occur, the quality of the reading shows a general decline as it is often combined with other media, resulting in "less focused engagement with a text" (NEA, 2007, p. 10).

The generic preferences of Generation Y students can be summarised as follows (Wessels & Steenkamp, 2009):
- They prefer to learn and work in *teams* where a peer-to-peer approach is common, with some finding peers more credible than lecturers when it comes to determining what is worth paying attention to.
- They are very achievement-oriented with a preference for *structure* rather than ambiguity.
- They are oriented toward inductive discovery or making observations, formulating hypotheses, gaining an understanding of the rules and craving *interactivity*. The rapid pace with which they like to receive information means they often choose not to pay attention if a class is not interactive, engaging or too slow.
- They are more comfortable in *image-rich* environments than with text. They will refuse to read large amounts of text, whether it involves a long reading assignment or lengthy instructions. They prefer doing things, not just thinking, listening or talking about things.

Impact of Learning Styles for Educationalists
Research into their experiences as students in higher education suggests Generation Y students enter university with very different learning backgrounds, experiences, preferences, attitudes and skills sets. This situation calls for different pedagogies and learning style strategies, together with new forms of learning environments (Shih & Allen, 2007; Wessels & Steenkamp, 2009). Learning styles in this context can be defined as characteristic preferences for alternative ways of taking in and processing information (Litzinger, Lee, Wise & Felder, 2007). Generation Y students require *structure*, both within the classroom and in relation to learning administration and infrastructure, with *experiential learning* seen as the dominant pedagogy with 'hands-on and *interactive* assignments and in class activities', 'team-work' and 'collaborative presentations' resonating well with them (Shih & Allen, 2007, p.98). Alongside structure, *teamwork* and experiential activities, Jonas-Dwyer and Pospisil (2004) add technology, entertainment and

excitement to Generation Y's learning and communication preferences on campus, whilst Partridge and Hallam (2006) argue that curricula should include *real world activities* and perspectives, and that they should be customisable and *flexible*.

Use of Images vs. Text

Visual modes of learning are especially important for Generation Y students, who grew up on television, video games, computers, the Web, and other increasingly sophisticated multimedia presentations (Manuel, 2002). According to Manuel, related to Generation Y students' orientation toward images is a preference for holistic processing and nonlinear, non-sequential modes of learning. They need to see the big picture when being introduced to concepts and procedures. They have to see a picture first; then one can tear apart the picture into components and test students on their ability to rebuild the picture. Most lecturers, in contrast, are quite comfortable being told to do step one, then step two, etc., without first being told the outcome or purpose of these steps.

Use of Technology

Australian research has highlighted that students regard the use of audio/visual recording of lectures and the virtual classroom as of greater significance than lectures (Baron & Maier, 2005). Students want educational technologies that meet their learning preferences and active lifestyles to be used more effectively and consistently. Faculty, on the other hand, are concentrating on using electronic features that will assist them administratively – utilising innovative features for enhancing learning is a relatively low priority.

Educational technologies allow for increased mobility in that students can access learning materials and communicate and collaborate online at any time and in any place. Students want image-rich environments, but they do not want to waste time and need information quickly. Although they want technology to be used more consistently and effectively, they also desire the face-to-face social interaction that campus life brings.

Muir (2001) argues that although the traditional content of readings, lectures, discussion boards and the like are valuable and should be included, lecturers need to develop different activities to cater for different learning styles, and pedagogical strategies need to be incorporated into each element so that all learning styles are addressed. As lecturers use technologies, it is important to consider the relationships between technology and teaching strategies so that better courses can be designed (Becker et al., 2007).

Lecturers could employ various other strategies, but if lecturers focus on structuring their courses clearly and delivering and assessing them in line with this structure, a number of the preferences of Generation Y students could be addressed as discussed in this section.

Research Methodology

A survey was conducted among students in the Faculty of Economic and Management Sciences at a South African university to assess the practices they employed when using Web 2.0 applications. The questionnaire was developed based on the current practices employed by users identified in research studies conducted internationally. The focus was specifically on Web 2.0 sites, tools and applications, as these technologies provide the best possibilities of utilising the Internet in teaching environments, due to the potential interactive nature thereof.

Results

In total, 2 944 invitations to participate in the study were sent to students. Altogether 660 students completed the questionnaire. The response rate of 22.4% is considered sufficient to arrive at the necessary conclusions. The available demographic information of the non-respondents was compared to the respondents and their profiles were similar.

Reported Interaction with Technology

Respondents indicated that 38% accessed Web 2.0 sites at least once a day, with a further 38% accessing it at least once a week. In total, 76% of the respondents, therefore, accessed Web 2.0 sites at least once a week, clearly indicating that this was a favoured activity. This is borne out by the time spent on Web 2.0 sites in an average week. While one fifth of the respondents were unable to estimate the time spent on Web 2.0 sites, 14% of the respondents that were able to make an estimation spent more than five hours per week on Web 2.0 sites, with a further 20% spending between three and five hours per week on Web 2.0 sites. The most frequently visited sites based on type of site are set out in Table 1.

Table 1

Most Frequently Visited Types of Sites

Type of Sites	Percentage
Personal communication	
Webmail (e.g. Gmail, Webmail)	32.8%
Social networking sites (e.g. LinkedIn, Facebook)	27.8%
Web-based Instant Messaging (e.g. MSN Web Messenger)	7.9%
Information source, excluding current events or news	
Online encyclopaedia and information sources (e.g. Wikipedia)	13.3%
Entertainment	
Online video sites (e.g. YouTube)	4.8%
Photo sharing sites (e.g. Flickr)	4.1%
News, current events, sharing of views	
Blogs	2.4%
Forums	1.8%
Really Simple Syndication (RSS) feeds (e.g. Newsvine)	1.4%

Podcasts	1.2%
Applications, virtual lives	
Online applications (e.g. Thinkfree, Smartsheet)	2.0%
Second Life	0.6%

Social networking sites rank second to e-mail accounts in terms of popularity of usage. It is interesting to note that the sites with a direct communication component are used more often than content driven services.

Utilisation of Web 2.0 Services
One of the primary characteristics of Web 2.0 sites is the interactivity of the sites. More than half of the respondents (53.3%) indicated that the activities they performed most often on Web 2.0 sites were viewing the websites of other users. However, 15.0% and 8.4% of the respondents respectively indicated that they submitted and amended information, while 23.3% used online applications. Nearly half of the respondents, therefore, fully engaged with Web 2.0 sites in the manner in which, in their opinion, Web 2.0 sites had been designed to be utilised. These results are summarised in Figure 1, which provides a more detailed breakdown of the manner in which the respondents interacted with different types of Web 2.0 sites. These findings concur with the findings in international research by Guess (2007) and Horrigan (2007).
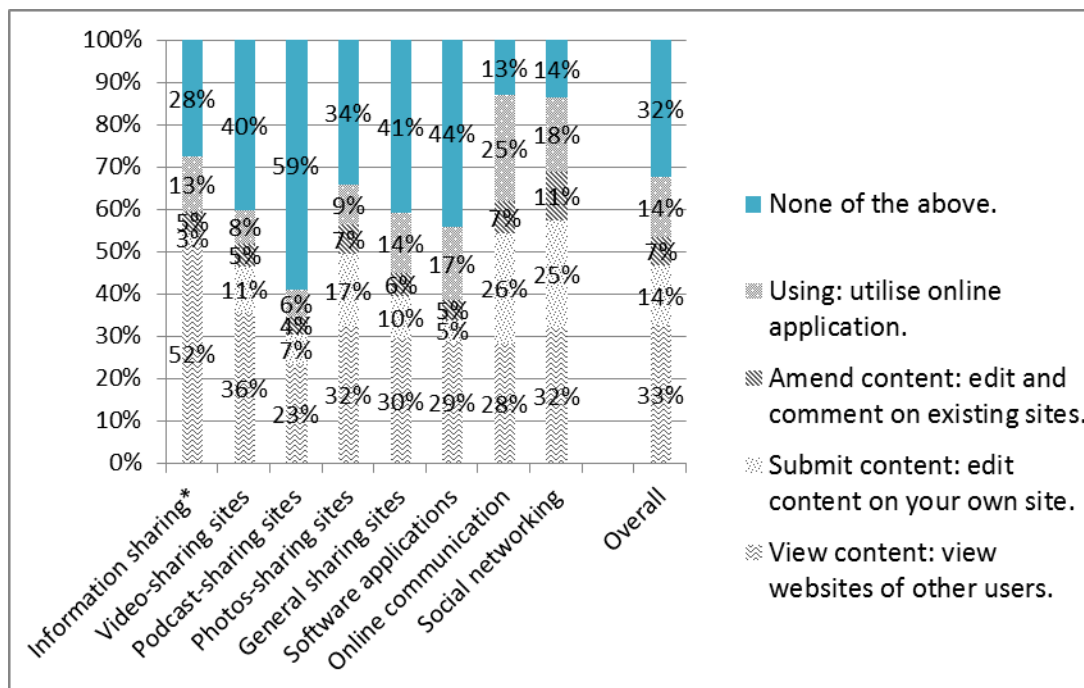

Figure 1. Different Methods of Interacting With the Types of Web 2.0 Services

* Information sharing refers to websites where information is predominantly shared by way of text.

Discussion

Against the background on learning styles of Generation Y and the reported use of Web 2.0 technology, a suggestion is made of potential ways of engaging with these students. This is summarised in Table 2.

The starting point for this analysis is listing the different methods of interacting with Web 2.0 sites in order of preferences and comparing them to preferences as discussed in section earlier. Based on this a number of suggestions are made.

Table 2

Suggestions for Utilising Web 2.0 in Teaching

Service	Usage	1*	2*	3*	4*	5*	6*	7*
Online communication	87%	X		X	X		X	
Social networking	86%	X		X			X	
Information sharing	72%							
Photos-sharing sites	66%				X			
Video-sharing sites	60%			X	X			X
General sharing sites	59%	X	X	X	X		X	
Software applications	56%	X	X	X			X	
Podcast-sharing sites	41%							

* Key
1. Teamwork
2. Structure
3. Interactive
4. Image-Rich
5. Experiential Learning
6. Flexible
7. Real-World Activities

The analysis in Table 2 was prepared on the assumption that the Web 2.0 technologies are used in projects that students should complete as part of their assessment on the attainment of outcomes. A similar analysis would be possible when considering teaching in a traditional lecturing style. The scope for

interaction by students with these technologies is severely limited in the traditional lecture, and such a summary is therefore not provided.

A popular Web 2.0 technology is social networking, and this can be used in a project to meet some of the preferences of Generation Y students. For example, by requiring students to work in teams and setting up a specific social networking page for the project, a number of objectives can be met. Clearly teamwork is addressed, but the interactivity of the social networking site should be well received. This also allows for flexibility for the students, as they can work on it when they wish and interact with each other and the lecturer when it suits them. By adding a wiki to the project, a certain level of structure can be provided to students, but it still allows for interactivity and flexibility.

Video sharing sites can be incorporated in a course by either uploading lectures to these sites, or requiring students to prepare, record and upload videos of presentations related to their projects. By allowing other students to comment, the rest of a class may, for example, assess the quality of the work.

No suggestions were made for a number of items in Table 2, for specific reasons. Information sharing sites were not addressed; as they do not provide any of the Web 2.0 benefits that Generation Y seek. This does not mean the data should not be used, but in this instance no additional benefit would probably be derived by their inclusion in the analysis. Podcasts were ignored, as less than 50% of the respondents indicated that they use them. It is, however, worth reconsidering this technology in a number of years, as usage patterns may change quickly. No suggestions were also made for experiential learning. This would be extremely subject, context and project specific, so any or all of the listed technologies may play a role in this aspect.

Conclusion

It is easy to assume that lecturers understand their students, but there is often a difference in perspective between Generation Y students and lecturers. The aim of this article was to highlight the learning styles preferred by Generation Y students and to identify strategies lecturers could use to address these preferences. Students' actual interaction with technology was analysed to provide suggestions for in-class or educational use. Educating students is the primary goal of universities. However, reaching that goal depends on understanding those students in order to create learning environments that optimise their strengths. With planning and listening to students, it is possible to reach stated learning outcomes, while also addressing the needs and preferences of students. The possibilities are limitless and there are vast opportunities to engage with students in a manner that they prefer and that addresses their learning needs and preferences. For this to be effective though, course designs and activities would probably need to be redesigned from scratch, to prevent strategies from being seen as mere add-ons with no real educational value.

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