

## The media generation: Maximise learning by getting mobile

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### *Abstract*

*The rapid increase in the use and broadcast of multiple media streams over the past decade or two has led to changes in the ways young people gather and process information.*

*There has been a generational shift between past and present students — the rift between current students and their previous peers is accentuated by the amount and variety of media they were exposed to as they grew up.*

*This presents exciting challenges for the tertiary educator. We have accepted that lecturing to our students is not enough to educate our students. But current use of learning management systems may not be enough to fully engage our students or offer them the flexibility in their study life that is recognised as being important to provide an environment for deep learning and understanding to take place.*

*Using the communication media with which our students are most familiar and proficient may be a hurdle for educators and institutions. However, the integration of mobile devices will offer true flexibility for our students and fit in with their digital lifestyle.*

*This paper outlines the rise of the media generation and what educators should consider when teaching this new type of student. A case study of an existing project using text messages on mobile phones is presented as an example of how we can meet these learning challenges.*

### *Keywords*

*mobile phone, mLearning, text message, SMS*

## Introduction

The 'm' in mLearning generally refers to mobile; the delivery of content and learning interactions via mobile devices. Mobile devices allow learning with "no fixed location or time" and "there is much evidence that mobile technology is going to provide a natural extension for e-learning in the long run" (Kinshuk, 2003). This aligns with the common goal of flexible learning as being able to offer options for the 'time, place and pace' of a students learning.

This would include devices such as mobile phones, portable digital assistants (PDAs) and iPods. It would not include laptops, as while they are portable, they are not mobile. However, laptops do offer flexibility, especially in the presence of a mobile network or wireless Internet access. Mobile devices should fit in your pocket.

The 'm' could easily stand for miniaturisation due the increasingly smaller devices we interact with. It could also stand for media learning, as these devices are becoming more media-capable. These new small devices are the medium of choice for students, and their preferred tools for communicating, organising, keeping up-to-date and, hopefully, learning.

Educators Diane Oblinger and Marc Prensky promote the view that the current yearly intake of students is differing more from previous students than in the past (Oblinger, 2004; 2005; Prensky, 2001; 2004). Prensky favours the term 'digital native' while Oblinger talks about the 'net generation'. They note that new students are growing up with a glut of electronic media use and this changes them from previous generations of students whose learning experience was dominated by text in books and journals.

As well as consuming more images and sounds along with the text they do learn, they also interact with the technology more than previous generations. While 20 years ago most media was consumed passively, in the last 10 years a higher level of interactivity has evolved in electronic media use. The impact of computer gaming cannot be underestimated (November, 2005).

Many universities have caught the first wave of electronic flexible learning by offering content, facilitated discussion activities, collaboration, and communication online with a range of learning management systems (LMS, e.g. Blackboard, WebCT, Moodle, etc.). LMS offer real options to students, but still rely on a computer terminal to interface with this material.

The next wave is to extend the reach of this learning by delivering it on a wider range of devices that are more portable to complement existing systems. There are examples of practice using Short Message Service (SMS) text messages being used within education (Cheung, 2004; Horstmanshof, 2004; Jamieson, 2004). With the proliferation of mobile devices that students are now using, institutions should consider some form of mobile delivery to attend to new students. The time is right to make a start in this educational arena.

## Discussion

“Technology is an environment” (Hoffman, 2004) that our students now inhabit. Key traits for “today’s learners” are that they are:

- Digitally literate
- Always on
- Mobile
- Experimental
- Community-oriented

(Oblinger, 2004)

These students, born from 1982 onwards, by the time they are aged 21, on average, will have spent twice as long playing video games than they have reading, and four times more time watching television than reading (Prensky, 2001). Older generations who have read more widely would consider these figures alarming. Decrying this disparity will not change them, and will only exacerbate the situation if we continue to ignore it.

“One aspect of being a great teacher is to get a student to consider the obvious in such a new light that not only is his or her thinking changed, but the process of how to think is itself affected” (Fulghum, 1997). Prensky would argue that the student’s thinking is already changed (Prensky, 2001). His exploration of the concept of neuroplasticity is a poignant reminder to educators everywhere.

Educators need to be fleet of foot and adapt their material and methods of teaching to best fit this new breed of learners. An example of this is the ‘chunking’ of data that is happening, educationally and in society in general. Consumers can now buy just one song rather than the whole album. In education, we have long broken large and more complex material down into smaller ‘bite sized’ chunks. Some institutions even provide PDF workbooks to assist with this process (Northeast Texas Consortium, 2003).

Mobile devices are suited for ‘chunking’ due to their smaller screen size and storage capacity. The distillation of material into ‘knowledge bytes’ to be consumed by the learner, offers true flexibility of ‘time, place and pace’. The diversity of media that can now be delivered by these devices adds more depth to their application.

The bold experiment of Duke University in 2004 to issue iPods to their first year students has been successful (Associated Press, 2005). A Duke web page gives seven diverse examples of how the iPod has been used (Duke, 2004). The iPod first year experience final evaluation report (Belanger, 2005) has led to the development of the Duke Digital Initiative (Duke, 2005) focusing on “experimentation, development, and implementation of digital technology in an academic environment”.

Drexel University’s education school has decided to follow Duke’s example in giving out iPods to new students in their 2005 intake. “Rather than resisting a popular technology because it’s popular, we want to embrace that as a way to be more effective in communicating” says Drexel’s school of education director William Lynch (Perlman, 2005).

Organisations such as the Mobilelearn project which has 26 partners, 14 of which are Universities, have been debating the application of mLearning for a number of years and are about to have the 4<sup>th</sup> world conference on mLearning in October 2005. Phones are no longer toys; they are powerful communication tools, if we choose to use them. “Whether we like it or not, whether we are ready for it or not, Mobile learning represents the next step in a long tradition of technology-mediated learning” (Wagner, 2005).

Most lecturers view mobile phones as an imposition to their teaching spaces. Phones ringing can distract students; some staff have requested that they be turned off during class – a reasonable request that is simply good manners. Others though are leveraging their use and incorporating them into classroom activities. mLearning is considered to have potential for growth in education (Livingston, 2004; Rheingold, 2004). mLearning is a new paradigm within flexible learning.

The 2004 Mobilelearn conference in Rome drew three conclusions about mLearning:

- i. mLearning is a sub-set of eLearning — as such it needs to be considered within a blended learning strategy in the same way that any education institution or corporate training department needs to view all other learning delivery methods.
- ii. mLearning is a means to enhance the broader learning experience, not (as we predicted for eLearning) a primary method for delivering courses/distance learning.
- iii. mLearning is a powerful method for engaging learners on their own terms especially for those who could be classed as non-traditional learners or for those groups of students who cannot participate in classroom learning for whatever reason (Valentine, 2004).

Geddes (2004) considers the four key advantages to developing mLearning options for students being access, context, collaboration and appeal. Currently there are three models for SMS mobile phone use within mLearning.

- i. A ‘Push’ system, where the institution pushes out messages to all students in a course. Cost is to the institution and using an example of a paper with 200 students receiving four text messages a week, the cost would be \$1,000 a semester. This may be useful for course announcements (e.g. exam room change, tutorial cancellation). However, with study notes, not all students would want, or use the information contained in that message and it could be perceived as ‘mobile phone Spam’. The question also arises; do we require informed consent to deliver these messages to the students?
- ii. A ‘Pull’ system where students order specific information based on a menu of all listed content on a web page or a paper handout. Cost is per message to the student. This is similar to ordering a ring tone or a screen tattoo for their phone.
- iii. An interactive model where questions are either sent out or ordered, then answered, and replied to by the student to check the answers and receive feedback. This is the most expensive model as it may require many messages back and forth, leading costs to rise.

Of the three models used in the education world to date, the majority have been the ‘push’ system and the occasional interactive model. To date, a ‘pull’ system has not been found in education use. However, the ‘pull’ system has some clear advantages and it is surprising that it has not been used. ‘Pull’ systems have been successfully used for ring tones, screen tattoos and games. Ringtones were a \$3 billion business in 2003, expected to rise to \$7 billion in 2007 (Reuters, 2004). It is a model that students know and use for other services.

At the start of the 2005 University year at AUT, in their enrolment details, 82% of students reported having a mobile phone. Some institutions are using text messages as an alternative means of communicating with the students, especially around enrolment matters. Few are incorporating the mobile phone into the classroom. SMS has been used effectively in University courses in Australia (Cheung, 2004; Horstmanshof, 2004). Developing an mLearning portal is making an effort to engage the students with the technology that they use every day. Mobile learning adds another layer of support to the student’s experience.

## Case study

StudyTXT is a mobile phone on-demand study support system. Students can access SMS ‘knowledge bytes’ of information about the subject they are studying and review them in their own time, at any location. These would serve as a type of ‘digital flash card’, a modern incarnation of the traditional cardboard flash cards used for study.

The idea that such a system could assist student study arose while teaching a first year sports anatomy paper. To be able to apply anatomy to the analysis of a specific movement the student needs to understand the origins, insertions and actions (OIAs) of at least 48 muscles. These OIAs are taught in a lecture and reinforced in tutorials. Students are left to memorise the OIAs for application in the analysis phase of the course.

To assist with the learning of the OIAs, a series of paper based ‘flash cards’ were produced in PowerPoint and printed out, six to a page. Some students cut these out and used them. Those who used them agreed that they assisted their study. However, a large number of students didn’t use them. When questioned on their reluctance to use this study aid some commented that “it was not cool” to pull out your ‘flash cards’ while waiting for the bus and be seen to be studying.

To overcome this reluctance to use an opportunity to revise key content and to package it in a form of technology that the students are comfortable with, StudyTXT was developed as an educational product. The catchcry of StudyTXT is 'study anywhere'. Students have downtime during their day (waiting for a bus, riding on a train to their institution, waiting for friends to arrive, etc.) where they may not want to engage in traditional study due to the brevity of the time available to them.

However if there was an option where they could review key facts they require for their study, that were delivered and stored on their mobile phone, they may be more amenable to 'snacking on study'. While still in the realm of rote learning, there are always a number of things that need to be known, to be able to construct an answer that shows synthesis and application. Students with established study methods would probably not use this service. It would be a service that would add scaffolding and support for non-traditional students.

While facts are seen to be the initial content that can be delivered via a SMS message, we can also give learning pointers to assist comprehension and understanding of concepts such as mnemonic devices. The flexibility of the SMS server is not limited to just delivering SMS messages. With languages, audio messages of correct pronunciation could be delivered as a voice mail message and stored to be listened to again in the future for review.

Initially StudyTXT was considered a content delivery system and a form of rote learning, however ways of making it more interactive have been developed to incorporate the principles of constructivism. An example would be a legal paper focusing on a specific point of law. The argument could be explained in a lecture, and the text message could contain cases of where it could be applied. The student would have to think of how they could apply the argument in a variety of situations suggested by their mobile phone.

A commercial SMS server can host a database of 150 character text messages that are accessed by students 'ordering' a specific text item to be sent to their phone through a 'short code'. This service was set up for approximately \$9,000 with ongoing running costs of \$500 per month. Students are charged per message they ordered (0.30–0.50 cents per message). A menu of messages available for each paper is hosted on a web page (StudyTXT.com), or made into a PDF file, hosted within the LMS.

StudyTXT is a staged development with text messages chosen as the first step due to it being the lowest common denominator on all mobile phones. Flash movies (e.g. blood flow through the human heart) can be delivered where the mobile phone screen could show sophisticated animations to visually reinforce concepts. Java based applications can be written to provide some level of interactivity within the mobile phone. The current generation of mobile phone games are all Java based. Both Java and Flash based applications are seen as the future for mobile content (Gifford, 2005).

With the development of the 3G networks, bandwidth will allow the streaming of video. While SMS is a basic service, it is still seen to have value. It is the method of communication that our students are highly conversant with.

SMS is more than just a passing fad; it is a communication medium integral to young people's lives, whereby cost still remains an issue. The asynchronous nature of SMS is key to its phenomenal success. There is a very clear move towards MMS (Multimedia Messaging Service) and other image and sound based messaging and interfaces – camera phones have real potential for annotating learning."

(Mitchell & Doherty, 2003)

An improvement in academic achievement linked to StudyTXT use may not be an obvious outcome from this research. Many of the current uses for SMS in education (Faulkner, 2004; Horstmanshof, 2004; Gonzales, Ittelson, & Krebs, 2004) point to decreasing attrition from courses and providing another level of support for 'at risk' and non-traditional students. Attrition reduction could be a positive outcome alone. However, we believe that there will be achievement advantages to using the StudyTXT system with students. To date, one article has reported an academic improvement from using text messages with students (Ananova, 2005). Engaging the students with the subject matter by using technology is one common denominator mentioned in many of the studies.

Students choose to download just the messages they think they need. This can reduce the costs to the student. This control over what content they download and use from the menu has educational as well as economic value. This is seen as a key point in constructivist educational theory.

Learners can explore material in whatever sequence they choose (although there is a recommended route) and can decide which exercises to undertake and how long to spend on them. More resources were provided than were needed, thus giving the learner the opportunity to exercise judgment about the value of reviewing everything on offer. The learner is also able to exert significant control over the sequencing of activities.

(Shaw, 2001)

They could construct their own StudyTXT messages on their phone and store them as a draft on their subscriber identification module (SIM) card or within the phone's memory. However, many will pay the small fee to get a knowledge byte of content that they know is written by an authority, is moderated, and is relevant to their subject.

There is nothing magical about the StudyTXT concept. It will not work if students download the messages and do not view them regularly. As with all other study methods, StudyTXT will only work if they use it on a regular basis. Repeated and frequent exposure to study material is crucial to maintaining familiarity and mastery of the subject.

Informal focus groups with AUT and secondary school students to date have been positive when the concept of StudyTXT has been explained to them. They compared the extra cost of downloading the messages to print study guides that are currently used in secondary schools. University students agreed that there are some concepts that need to be reviewed frequently to ensure retention (e.g. muscle origins and insertions, biomechanical formula, etc.) and synthesis. The mobile phone is a convenient medium with which to do this reviewing.

A review of the literature on study using SMS shows positive feedback from students (Cheung, 2004; Faulkner, 2004; Gonzales, Ittelson, & Krebs, 2004). Most of these services were of the 'push' variety. As there has not been an educational 'pull' model, it is hard to predict exactly how the students will react. However, the similarity of the delivery method and the informal focus groups feedback to date allows for some triangulation for a positive outcome.

Key advantages to students include:

- True flexibility to control the time, place and pace of their learning.
- Specificity of content.
- Tutor constructed study aids designed for those areas that are 'challenge to learn' concepts.
- Using technology that is engaging and totally comfortable for the student.
- Non-threatening, private availability of on-demand study support.

Mobile phone integration within an existing LMS was explored. There is a building block within Blackboard that offers a 'push' SMS capability (clearTXT.com), however there are licensing costs (\$10K US per year) as well as call charges (0.17 cents per message, per student). This service is more suited for sending out informative messages and advertisements than being used as a learning tool.

A pivotal question to ask is: "Is the StudyTXT concept educationally sound pedagogy?" This is a valid question that will not be completely answered until it is operational, and research is carried out on the process and outputs. Based on the current research there are solid indicators that it has the capacity to be used effectively in education. However, it is an innovative use of technology within education such as the recent institutional distribution of iPods to the first year students at Duke University.

We're approaching this as an experiment, one we hope will motivate our faculty and students to think creatively about using digital audio content and a *mobile computing environment* to advance educational goals in the same way that iPods and similar devices have had such a big impact on music distribution.  
Tracy Futhey, Duke's vice president of information technology.

(Darby, 2004)

The StudyTXT service is currently being used in a trial within AUT with a range of subject areas (sport, nursing, business) to ascertain if students will a) use the service, b) pay for it, and c) find it beneficial to their study. Initial anecdotal feedback has been positive. They are using the service and forming study groups to swap messages they have downloaded using their 'free' text message allocation within their monthly phone plans.

This is considered a positive outcome, as it shows the students value the message and fosters collaboration and cooperation between students. As it is developed further, action research and measures of effectiveness will be carried out with staff and students.

## Future plans

Consideration to setting up a campus Wireless Application Protocol (WAP) server has been explored. With 95% of new phones being WAP capable (MyMobile, 2004), this looks promising as a cost effective way of providing mobile phone educational services to students. Bluetooth is another option, however limited range could hamper its development.

Integrating mobile phones into classroom activities has been explored with the use of the digital camera in the phone to collect data/evidence. Simple games have been effective (Cheung, 2004) and mobile 'learning swarms' suggest interesting possibilities (Alexander, 2004).

Convergent technology appears to be the way technology is moving in this area. People want all their small devices in one rather than having dedicated devices for each purpose. The possibilities of an iPod merging with a PDA and mobile phone are already surfacing (Reece, 2005). The 'iPhone' as proposed by Slone (2005) may be closer than we think!

This paper has focused on the mobile phone. However, there are other mobile devices (such as the PDA) that can be wireless, have a larger screen and greater range of applications available to use. To date they do not have the student penetration in the antipodes that the USA educational sector enjoys. This is one reason why we have not pursued this area for development.

Teachers must reach a point where they are exploiting the full benefits of technology to support their learners ... We need to combine subject expertise with deep knowledge of the technology to become educational technologists or technological educators.

(Good, 2001)

## Conclusion

As students continue to evolve in their use of technology, we should keep a close watch on their developments. While we have our own vision of future developments for technology in education, some consideration must be made of the end users and their preferences.

Educational institutions, by their nature, carefully consider undertaking new educational options for their students. While it is important to consider all implications when introducing new modes of learning, this must be balanced with the need to move rapidly on new developments that have the potential to benefit student learning. Innovation should be nurtured. "The goal is an organisation that is constantly making its future rather than defending its past" (Hamel & Valikangas, 2003).

As new technology is developed, integrating it with pedagogy is always a challenge. While every device has its unique strengths and weaknesses, the mobile phone is a key device for our students. It is now up to us to adapt its use to education.

And despite what some may consider cell phones' "limitations" our students are already inventing ways to use their phones to learn what they want to know. If we educators are smart, we'll figure out how to deliver our product in a way that fits into our students' digital lives – and their cell phones. And instead of wasting our energy fighting their preferred delivery system, we'll be working to ensure that our students extract maximum understanding and benefit from the vast amounts of cellphone-based learning they will all, no doubt, soon be receiving.

(Prensky, 2004)

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