

Introduction

The term web 2.0 was coined in 2005 (O'Reilly, 2005) as a way of characterizing the emerging interactive, user-centred web based tools that were revolutionizing the way the Internet was conceptualized and used. These tools include: blogs, wiki's, image-sharing (e.g. Flickr), video-sharing (e.g. YouTube), podcasting etc... Many educators have harnessed web 2.0 tools for creating engaging student-centred learning environments. This appropriation of web 2.0 tools within a social constructivist pedagogy facilitates what has been termed "pedagogy 2.0" (McLoughlin & Lee, 2008). This research project is interested in appropriating the benefits of web 2.0 and pedagogy 2.0 anywhere anytime using mobile web 2.0 (web 2.0 services that are formatted for use with mobile devices) and wireless mobile devices (or WMDs).

Definitions of mobile learning have focused initially upon the mobility of the devices and more recently the mobility of the learners. Sharples (2006) proposes a form of Laurillard's conversational framework (Laurillard, 2001), excluding the teacher, to define mobile learning by its contextual and informal learning characteristics. "The processes of coming to know through conversations across multiple contexts amongst people and personal interactive technologies" (Mike Sharples *et al.*, 2006). However, a key element in the conversational framework is the dialogue between teacher & student. In contrast to Sharples *et al.* (2006), Laurillard (2007) emphasizes the teacher's input in mobile environments through good pedagogic design that facilitates continuity between the face to face and remote peer learning contexts. Her definition of mobile learning incorporates the critical pedagogical design input of the teacher: "Mlearning, being the digital support of adaptive, investigative, communicative, collaborative, and productive learning activities in remote locations, proposes a wide variety of environments in which the teacher can operate" (Laurillard, 2007).

Recent research into mlearning has highlighted the context 'awareness' of mobile devices (Cook *et al.*, 2007; M Sharples *et al.*, 2007), and the ability to 'span' learning contexts (Wali *et al.*, 2008). However, what is unique about WMDs for mlearning is their ability to BRIDGE contexts – i.e. to provide ubiquitous connectivity independent of the context of use, thus linking multiple contexts into the learning environment, continuing learning 'conversations' via social presence and communication technologies. The WMD's wireless connectivity and data gathering abilities (e.g. photoblogging, video recording, voice recording, and text input) allow for bridging the on and off campus learning contexts – facilitating "real world learning". In particular, the context bridging and media recording capabilities of today's smartphones make them ideal tools for mobile blogging. Smartphones allow a user to send text, photos, video and audio directly from the site of recording to the users online Blog. An example of the potential of mobile blogging is the rise of citizen journalism (Cameron, 2006; Elmendorp, 2007; Fulton, 2007; Skoeps, 2007). Collaboration and communication with peers and tutors can be maintained in any context using WMDs with a

variety of communication technologies (email, online LMS, Instant Messaging, audio and video conferencing, SMS, MMS, mobile phone calls etc...).

This paper explores how the introduction of mobile web 2.0 technologies into a Bachelor of Product Design programme have impacted, disrupted and transformed the established teaching and learning paradigms. Several scenarios are detailed illustrating this transformation. The goal of the research and project has been to move pedagogical approaches in tertiary education from instructivist pedagogies to a social constructivist pedagogy (Vygotsky, 1978) and to facilitate a context bridging collaborative learning environment.

Disruptive technologies (Mike Sharples, 2000, 2001, 2005; Stead, 2006) are those technologies that challenge established systems and thinking, requiring change and are thus viewed by many as a threat to the status quo. Disruptive technologies democratise education environments challenging the established power relations between lecturers and students. Their disruptive nature forces a rethink of pedagogical strategies and relationships in education.

Research Methodology

The research summarized in this paper is part of a wider research project investigating the potential of mobile web 2.0 for enhancing tertiary education through a series of action research projects in a variety of disciplines. This paper focuses upon the effect of mobile web 2.0 upon the pedagogical development of one of these projects (Third year Bachelor of Product Design).

The wider research questions are:

1. What are the key factors in integrating Wireless Mobile Devices (WMDs) within tertiary education courses?
2. What challenges/advantages to established pedagogies do these disruptive technologies present?
3. To what extent can these WMDs be utilized to support learner interactivity, collaboration, communication, reflection and interest, and thus provide pedagogically rich learning environments that engage and motivate the learner?
4. To what extent can WMDs be used to harness the potential of current and emerging social constructivist e-learning tools?

Data gathering consists of:

1. Pre-trial surveys of lecturers and students, to establish current practice and expertise
2. Post-trial surveys and focus groups, to measure the impact of the wireless mobile computing environment, and the implementation of the guidelines.
3. Lecturer and student reflections via their own blogs during the trial. The blog is also an online eportfolio facilitating the collection of rich media resources capturing critical incidents and providing a dynamic journal of student projects and tutor input (both formative and summative).

The survey tool and focus group questions can be viewed online on Google Docs at http://docs.google.com/Doc?id=dchr4rgg_5478zdzbgw&hl=en_GB (Cochrane & Bateman, 2008). An action research methodology is used, creating a reflective research environment that continually seeks to improve the student learning outcomes based on regular student and tutor feedback. Students and teaching staff volunteer to participate in the research project, signing acceptable use and ethics consent forms to become participants. Participants were asked to reflect on the impact of mobile web 2.0 at several points throughout the trial, and used a variety of media to capture their reflections, including posts to their blogs, and VODcasts (video recordings uploaded to their blogs and YouTube).

Bachelor of Product Design Mobile Web 2.0 Project

Starting in February 2008, the focus of this project has been the development of group product design teams formed between the students and external client product manufacturers. Students must develop a commercially viable product for their assigned client. Student blogs and eportfolios are used to record and reflect on their design processes, and are made available to the client for comment and interaction. Students and staff were initially supplied with a Nokia N80 WiFi/3G smartphone and folding Bluetooth keyboard, which was later upgraded to a Nokia N95 smartphone. Students use the smartphone for recording and uploading evidence of their design process and prototypes to their VOX blog (<http://www.vox.com>) and other online media sites such as YouTube for video. Students are marked on this evidence of the design process and reflection, as well as their critique and reflection on other students' blogs via commenting. The smartphones are also used as a communication tool between students and with teaching staff for immediate feedback via instant messaging, email and RSS subscriptions. Students are responsible for paying for a voice call and text message account but are reimbursed the cost of a 1GB/month 3G data account. The project is supported by a weekly "Community of Practice" (Lave & Wenger, 1991), comprising the course tutors, the student volunteers, and the researcher who is also the 'technology steward' (Wenger *et al.*, 2005) for the community of practice. An interactive concept map illustrating the integration of the mobile web 2.0 technologies with the smartphone is available at <http://ltxserver.unitec.ac.nz/~thom/mobileweb2concept2.htm>.

Table 1: Outline of the Product Design Mobile Web2 Project.

Course: Bachelor of Product Design, third year class	
Participants	<ul style="list-style-type: none"> • 9 students – The average age of the students is 24 (19 to 33), and all are male students. • 2 Course Lecturers • Technology Steward
Mobile	Nokia N80 WiFi smartphone (upgraded to N95 in Semester2), Bluetooth

Technology	folding keyboard, 1GB/month 3G data
Pedagogical Focus	Documenting the research and design of three products throughout the year, including working with a client company in small design teams
Community of Practice	Weekly throughout the entire course
Support LMS	Moodle
Deliverables	An online Blog/eportfolio documenting and showcasing your design processes and forming the basis of a collaborative hub with worldwide peers and potential employers/clients.
Timeframe	February 2008 through to November 2008, expanding to entire three year course in 2009.

Transforming Product Design

The following section outlines several examples illustrating how the introduction of mobile web 2.0 technologies has impacted and transformed the Bachelor of Product Design course.

Mobile Web 2.0 scenarios in Product Design

Major Project – changes from 2006 to 2008

The third year major assignment has been modified each year between 2006-2008 to assist students to grasp and understand the complexity of the design process, facilitate social constructivist learning and improve the level of integration within student projects. The full assignment outline is available for viewing on Google Docs (Bateman & Cochrane, 2008), included here are the details of deliverables that have changed between 2006 and 2008.

Table 2. Third year Bachelor of Product Design major assignment changes.

Assignment Iteration	Deliverables
2006	<ul style="list-style-type: none"> • A report summarising all research undertaken and the key findings and insights. • All forms of prototype and test modelling i.e. 3D sketch models / ergonomic models / interface design wireframes / proof-of-concept working models, etc. • All drawings, sketches and CAD models.
2007	<ul style="list-style-type: none"> • A report summarising all research undertaken and the key findings and insights. • All forms of prototype and test modelling i.e. 3D sketch models / ergonomic models / interface design / proof-of-concept working models, etc.

	<ul style="list-style-type: none"> • All drawings, sketches and CAD models. • A project plan for Part Two of the Major Project • A blog that runs throughout your major project. You should post to your Blog regularly • Use your blog to collate project information and reflect on your design process. Also regularly comment on each other's blog posts – providing critique, feedback, and links to appropriate resources.
2008	<ul style="list-style-type: none"> • A report summarising all research undertaken and the key findings and insights. • All forms of prototype and test modelling i.e. 3D sketch models / ergonomic models / interface design / proof-of-concept working models, etc. • All drawings, sketches and CAD models. • A project plan for Part Two of the Major Project • A VOX blog/eportfolio that runs throughout this phase and the rest of the year. You should post to your Blog at least weekly (preferably daily). <ol style="list-style-type: none"> 1. Use your VOX blog/eportfolio to collate the above, and reflect on your design process. Also regularly comment on each other's VOX blog posts – providing critique, feedback, and links to appropriate resources. Your VOX blog/eportfolio should include the following: <ol style="list-style-type: none"> 2. An audio Podcast 3. A Video VODCast 4. Uploaded images (include geotags if possible – i.e. Google Maps links of image locations) 5. Text posts (Reflection, critique, process, summary, comments...) 6. Links to Web2 multimedia site original content (e.g. create your own accounts on YouTube, Flickr, Google Docs, Slide.com etc...) 7. Use shared Google Calendars for course events/dates. • Electronic communication will be via GMail, MSN Messenger and RSS feeds (e.g. via Google Reader or Newsgator).

Student example/s

A student decided to use the smartphone's camera to record still images and video podcasts outlining significant and iterative steps in the design process when designing a snow kite harness. This allowed the student to reflect and critique their design work and design methodology using visual media rather than simply creating a text-based book or online journal. This took place over the six month product design project. Video clips were recorded from the design studio on campus, from testing in the local park, and from test flights during two ski-field trips in the South Island of New Zealand. The course lectures followed the student's blog posts, offering tips and design guidance while on campus, at home, and while attending overseas conferences. The video clips were later edited and compiled into a ten minute video overview of the most significant design steps taken over course of the design project. The compilation video was then uploaded to YouTube and the student's blog for showcasing and sharing.

NPC Project – changes from 2007 to 2008

One of the Bachelor of Product Design courses modified by the inclusion of mobile web 2.0 technologies was the New Product Commercialization (NPC) paper. Below is an outline of the change in NPC assessment deliverables facilitated by mobile web 2.0:

Table 3. Third year Bachelor of Product Design major assignment changes.

Assignment Iteration	Deliverables
2007	<ul style="list-style-type: none">• One booklet that provides a concise overview of successful product development and commercialisation processes. This booklet must have high production values and must reflect the importance that design plays in this process (see letter that you have been sent to read more detail of what is required).
2008	<ul style="list-style-type: none">• A blog that provides a concise overview of successful product development and commercialisation processes. The blog must reflect the importance that design plays in this process.• On a weekly basis and in addition to notes taken at each of the guest lectures, you must find an article that raises issues related to “New Product Commercialisation” (e.g. NZ magazines Design and Business, such as IDEALOGY, BRIGHT, UNLIMITED), the article maybe directly relevant e.g. the description of an NPC project, or it may simply raise issues that you can discuss in terms of NPC e.g. the impact of imports, a clever marketing initiative, tax changes for R&D etc...• Using a blog as a mean of communication, you will write a synopsis of the article followed by your own interpretation of the points raised in it (Around 500 words per post). The synopsis and comments are to be published in a blog along with a link to the original article either as a weblink or magazine’s reference for the submission. Tag your NPC project blog posts (and any other relevant media you upload to your Blog – e.g. supporting images, video, podcasts, embedded YouTube videos etc...) with the tagword “NPC” to allow tracking and collation of your posts. You could also define an “NPC” collection within Vox.• Collaboration and interaction are important aspects of the project. Therefore each student will work with their group to refine their chosen article and any additional comments on it using the ‘comments’ feature of each other’s Blogs. The article will then be presented every week at the tutorial group sessions. It is expected that each member of the work-group will be familiar with the article and be able to assist the author in reporting back.

Student blogging example/s

The following is an example of a student blog post for their NPC paper and the resulting comments from their classmates. The post and comments show significant engagement and critical reflection occurring by multiple parties. The use of the blog facilitated the posting of student reflections on examples of new product commercialisation and the extra dimension of peer critique of these ideas, with the ability to respond and enter into a collaborative ‘conversation’. The use of WMDs (smartphone) facilitated searching for examples anywhere, anytime, and the ability to upload supporting media directly to the student’s blog. However, student’s did not tend to read each other’s blogs on their smartphones, as due to the small screen size they preferred viewing each other’s blogs on computer. Students were encouraged to subscribe to each other’s blog RSS feeds

to enable automatic notification of new posts for discussion. Additionally, VOX features a weekly 'neighbourhood update' email, that students could receive and read on their smartphones.

NPC - week 6 - How Heinz is Spicing Up Sales

Sep 8, 2008 at 5:11 PM [7 comments](#)

[Viewable by friends and family](#)

Ketchup remains a money-spinner, but the company is piling up hits—like ABC soy sauce—overseas

http://www.businessweek.com/magazine/content/08_36/b4098028900467.htm?chan=innovation_branding_top+stories

When H.J. Heinz came out with 12% first-quarter earnings growth on Aug. 21, it was easy to see traces of ketchup throughout the good news. With more Americans eating at home and opting for french fries when they eat out, the \$10 billion food company's flagship product is indeed doing well, with 8% sales growth worldwide.

But Heinz's hottest brand these days is a syrupy soy sauce called ABC. The Asian label, which also includes a few side products like beverage syrup and chili sauce, saw a 44% increase in sales over last year. Created in the 1970s and acquired by Heinz in 1998, ABC has tripled in size under Heinz's ownership and is now the world's second-largest soy sauce (next to Japanese brand Kikkoman). It's also a recognized name in emerging markets, a category that accounts for 15% of Heinz's business—and that CEO William R. Johnson hopes to grow to 20% by 2013. Thanks to a major overhaul in packaging, marketing, flavors, and distribution, ABC generated more than \$200 million in sales in the last year, much of it in Indonesia.



For all its progress, though, Heinz's innovation machine is not yet in top gear. The Pittsburgh-based company is slightly behind its peers in deriving just 11% of its sales from products introduced in the last three years, according to Sanford Bernstein senior analyst Alexia Howard. But Heinz is fast closing the gap. "This company spent a decade with really no innovation," says Howard. Now, she adds, Heinz is showing a lot more strength in product development.

Opinion:

Is this really innovation? When a brand buys out another and re brands it then uses the large established brand (heinz) to market the other I'm not sure this is really an innovation. This is however often a smart marketing choice. By those buying, and those being bought.

There are many small companies struggling to get by. however with a bit of muscle (brand muscles that is) behind them it is likely that the popular group will pick them up. For example: Sour lollies are horrible in taste and almost impossible to handle. But how do they keep being sold? It appears that it is cool to try and swallow these horrible tasting lollies.

The same happens in many brands like the ABC sauce. Many other brands also lack the brand popularity to succeed in the market. MIA make excellent, custom hockey gloves but were relatively unknown and didn't even become popular when pro players wore them. They were recently taken over by Warrior hockey. A much more popular and cool brand. Warrior also has much more money, brand strength and marketing behind them. Now MIA is a much more popular glove under the Warrior umbrella.

Fig 1. Screenshot of example student NPC blog post.

Comments



Noel wrote:

4 days ago | [Reply](#)

I'd agree that this really isn't really innovation but clever marketing of a product, backed a larger budget. This may work to boost short term sales, but long term innovation must be with the product not the marketing. An innovative product can often sell itself.

oh and sour lollies aren't horrible and impossible, they're just for people with a different pallet.



Steve wrote:

4 days ago | [Reply](#)

No pallet bullshit, they are horrible.



Gareth NPC wrote:

4 days ago | [Reply](#)

Is Heinz the one calling it innovative? I don't think they really care what people call it, the only thing they're bothered with are how much money they're making.



Dan joblin NPC blog wrote:

4 days ago | [Reply](#)

interesting choice about marketing. i like the concept of using a big brand to market a small brand.



jamy-BlogVX (NPC) wrote:

4 days ago | [Reply](#)

Is that really a good idea to having such small company, being compares with a big company?

I am totally disagreeing to the strategies that the company is aiming to do, in order to increase their market shares.

Moreover, I believe it will become a huge issue for the company to inventing new taste or flavor on their new products, which will not change people's taste in traditionally and suddenly wanting to purchase a new taste product that is different to what they are used to eat before, or recognized on a particular branding



Steve wrote:

4 days ago | [Reply](#)

The thing is that it is actually very common for companies to own other companies. There are examples all over the place. Like Coca Cola owns Powerade. It is inevitability that larger established companies will want to buy up smaller companies that have good ideas going for them.



Mervin NPC wrote:

3 days ago | [Reply](#)

When Heinz bought out ABC soy sauce they already had the strategy in place all that mattered after that was at what price they would appropriate the product's existing brand value from its previous owners and then set their own kind of brand building to make it a world leading product. Sometimes the reverse happens when relatively unknown companies with vast financial reserves buy up other companies with better branded products Tata Industries taking over Jaguar, SAB taking over Millers Beer but still this is not innovation.

Fig 2. Screenshot of example student NPC blog comments.

Students used the mobile web 2.0 technologies to blog their assignment posts from virtually any context. As an example, four of the students decided to go on a mid-term 'research' trip to the snowfields of Queenstown, officially to test their prototype snow-kite harness designs. However, two of these students were scheduled to present their NPC research to the class that week. These students therefore recorded their NPC class presentations on their N95 smartphones, and uploaded the virtual presentations to their Vox blogs for the rest of the class and the course tutor to view and comment on their presentations, in almost realtime. To 'prove' they were in Queenstown they also blogged mobile videos of their campervan and Queenstown scenery.

Beyond NPC

During the course of the year academic teaching staff have visited three overseas countries: Japan, UK, Spain as well as numerous New Zealand towns outside of Auckland: Rotarua, Tauranga, Napier, Hastings. Staff used mobile web 2.0 technologies to pass relevant information to their student(s) from these countries and locations.

Scenarios

1. During April 2008, a staff member visited Kyoto, Japan to participate in a conference that took place during the teaching semester. This scenario provided the opportunity for the staff member to test the use of Web2 as a distance communication tool: could regular contact be maintained between the staff member and students and information be easily shared using a smartphone? The use of mobile web 2.0 technologies allowed real time text, video and still images of the conference, sites, design, architecture to be easily and immediately uploaded to the staff members blog for students to see and share in. By return, the use of instant messaging and blog comments allowed students to remark on the posts, pose questions and request further information on the conference before the end of the visit.
2. In a second case, a staff member was required to make a trip to the Spain and the UK taking valuable time away from teaching. At this stage, students were well advanced into their projects and having a staff member overseas posed a potentially difficult situation for them and the programme. The use of mobile web 2.0 technologies allowed the staff member, his fellow staff members and students to stay in regular contact sharing comments and project concerns: in effect a 'virtual studio situation' was created. Upon the staff members return, there was no need for time consuming catching up to take place and students were

not significantly disadvantaged due to his taking time away from studio teaching.

Student Feedback

Student feedback on the integration of mobile web 2.0 technologies into the curriculum has been extremely positive. Students were asked to provide reflective feedback at the end of semester one:

As a record keeping tool, these things (Blogs) allow you to go back and see what you did last week, and you can constantly inform your decisions based on what you have done in the past. Whereas if you have it in a notebook that sits in a corner of your room you forget that stuff, but you look at your blog everyday, and so from that perspective it makes things better. Traditionally when you write something down in a notebook a lecturer will only read it at the end of the project when they mark it, but with blogging you can write something down and tutors and other students can comment almost immediately, so you get more real-time feedback.

An example of moblogging is – here's a bunch of images I've just photographed while in the Library and then I straight-away upload them, then I can comment on them, my classmates can comment on them, so I find it a lot faster, and it's productive time. Also you can see what other students have just blogged and see what they are thinking about at the moment – so we've got our heads in everyone else's projects as well, so you are not just in your own little box (Bachelor Product Design Students 2008).

Students were surveyed at the end of the NPC Project (mid semester two 2008) using SurveyMonkey. The student feedback is useful in critiquing the impact of the mobile web2.0 technologies on the course. Sixteen of the eleven students in the class responded, nine of these were mobile web 2.0 users:

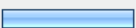
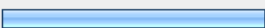


1. Did you enjoy this project?			
		Response Percent	Response Count
I found it really stimulating		27.3%	3
It was OK		54.5%	6
Not really		9.1%	1
I'd rather eat my own shorts		9.1%	1
Other (please specify)		0.0%	0
answered question			11
skipped question			0

Fig 3. Student responses to NPC survey question1.

The majority of the students enjoyed the project (see fig 3).

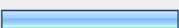
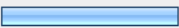
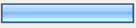
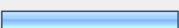
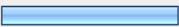


2. What were the benefits to your learning of using the Blog and commenting in this assignment? Choose all that you agree with.			
		Response Percent	Response Count
Greater interaction with my classmates ideas		36.4%	4
It produced more in depth reflection than a paper-based assignment		36.4%	4
I could use a variety of media to illustrate my ideas		27.3%	3
It was flexible (I could blog from anywhere, anytime)		36.4%	4
It produced a valuable record of my learning		36.4%	4
 view Other (please specify)		9.1%	1
answered question			11
skipped question			0

Fig 4. Student responses to NPC survey question2.

Students recognised and appreciated the benefits of the use of a blog for facilitating the project (See fig 4).

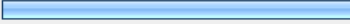




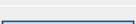


3. What were the disadvantages of this approach to the assignment? Choose all that you agree with, and/or enter a comment.			
		Response Percent	Response Count
It was time intensive		72.7%	8
I couldn't cheat		18.2%	2
I had to maintain another blog		18.2%	2
I don't have broadband at home		9.1%	1
I didn't like my group		9.1%	1
Not everyone pulled their weight		27.3%	3
 view Other (please specify)		9.1%	1
answered question			11
skipped question			0

Fig 5. Student responses to NPC survey question3.

Students expressed the time intensive nature of regular blogging and commenting, and the issues of work-parity in group assignments (See fig 5), however the mobile participants were unanimous in preferring this new approach to assessment and feedback to that of more traditional approaches (See fig 7).

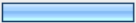




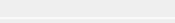


4. How did you use your N95 with this project? Answer all that apply.			
		Response Percent	Response Count
I uploaded photos to VOX from the N95		27.3%	3
I uploaded Videos to VOX or YouTube from the N95		18.2%	2
I browsed for relevant info on the N95		18.2%	2
I subscribed to my classmates' blogs using the N95		0.0%	0
I checked my VOX weekly neighbourhood email update on the N95		27.3%	3
I listened to relevant Podcasts on the N95		9.1%	1
I watched relevant YouTube videos on the N95		36.4%	4
 view Other (please specify)		45.5%	5
answered question			11
skipped question			0

Fig 6. Student responses to NPC survey question4.

Students used their smartphones to research content, upload and interact with their blogs in a variety of ways (see fig 6).

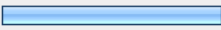

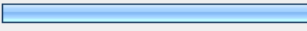
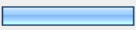


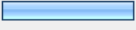
5. How could this project be improved? Answer all that you agree with or/and add a comment.			
		Response Percent	Response Count
By using a VOX group page instead of multiple new blogs		45.5%	5
I should have used RSS to subscribe to my classmates' blogs		9.1%	1
Weekly formative feedback (comments) from the tutor on our posts		63.6%	7
Having more time for research and reflection		27.3%	3
I'd rather go 'old-school' with a paper journal or research essay		9.1%	1
 Other (please specify)		27.3%	3
answered question			11
skipped question			0

Fig 7. Student responses to NPC survey question5.

While students were encouraged to use their original course VOX blog for the NPC project and identify NPC postings using tags, most students created a secondary blog using VOX for the NPC project. The effort of maintaining multiple blogs convinced students of the benefits of tagging within a single blog, or alternatively creating a group within VOX for specific projects.

A key issue identified by students (See fig 7) was the lack of regular formative feedback from tutors on their blog posts. This was due to time pressure on the tutors, however this lack of formative feedback then created a more time intensive summative marking and feedback process at the end of the NPC project. This has high-lighted the affordance of blogging for providing an avenue for regular formative feedback from tutors.

Fig 8 provides an overview of what types of activities and how regularly students used their smartphones as enabling tools within their course and their wider social lives. Students integrated the mobile technologies into their daily routines in a variety of ways, and they were encouraged to personalise the use of the smartphones throughout the period of the project.

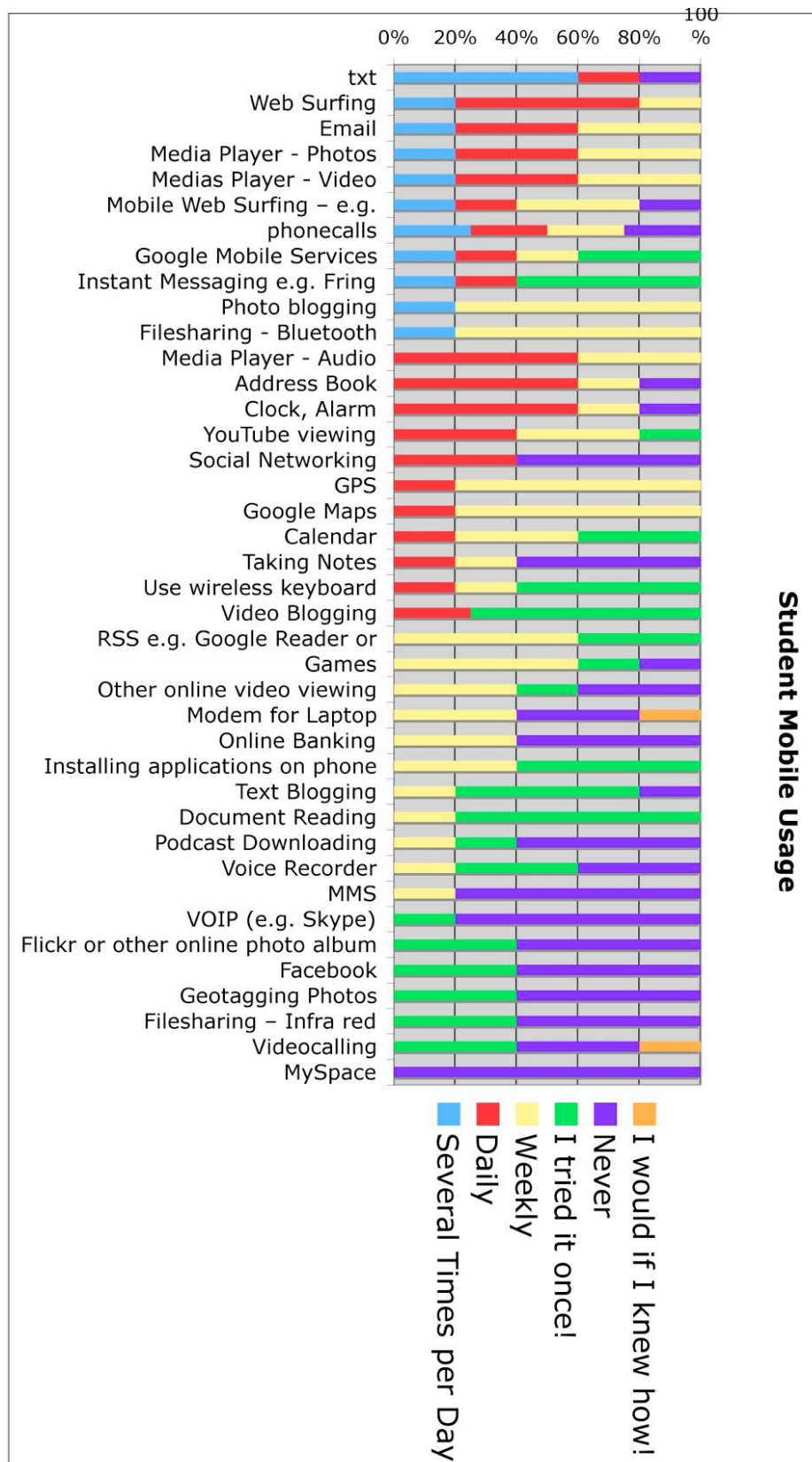


Fig 8. Student mobile usage.

Staff Feedback

Teaching staff were asked to reflect on the the impact of the introduction of the mobile web 2.0 technologies on the course, using the following questions related to the main research questions for the overall research project.

1. What potential benefits do you see for mobile web2 to enhance teaching and learning?
2. Have you (so far) seen increased engagement in the course from students when using this technology?
3. What are the key issues for integrating this technology into your courses?
4. In what ways has (or will) your teaching approach changed by using these tools?

1. What potential benefits do you see for mobile web 2.0 technologies to enhance teaching and learning?

The integration of mobile web 2.0 has facilitated a shift away from the default Atelier ‘private method’ of instruction to a new more fluid and dynamic pedagogical method. This project has deliberately disrupted the timetabled instructivist studio learning that is frequently used and placed the student group in a social constructivist framework.

The chief benefits we have noted are:

1. Increased interaction, problem solving and sharing between students, increased interactivity in general – this has come in the forms of: encouragement, sharing of data and content, passing on of online material and the ‘hey you should know about this’ comments.
2. Increased interaction from external commentators – especially when working on live projects. Clients have been able to track projects in the making and steer students if need be. At final presentations clients have followed the projects over the duration of the assignment and can closer comment on the projects outcomes and validity.
3. The development of student reflective journals. The Blogs have effectively become online reflective rich media journals. Keeping an overview of a design project is difficult. Valuable time is taken up when standing back and assessing the state of the project. Reflecting on project work is difficult as the designer is often engulfed in the project. By introducing blogs to the students and requiring them to blog daily, we have created ‘natural’ times when a brief overview of the design project can be created in a readily accessible and exciting form. This overview can serve to keep the project on track and act as a ‘call’ for comments from peers and staff.

4. Designers often find it difficult to document their processes and methodologies and as a result of this find it hard to remember how they got to the end result. This project has created a 'bread crumb' trail that students can go back to both during and after the project to check their working methods (staff can do this with their work too).

2. Have you seen increased engagement in the course from students when using this technology?

The initial stages of the project saw a drop off in normal project activity as students explored the mobile web 2.0 tools, including the setting up of the software and hardware and the fun students had exploring the new technology that was available to them. However as the tools became second nature and integrated into the students' daily work-flows a significant uptake in engagement in the course was observed.

The increased engagement came from:

1. A sense of connectivity that is characterised by the immediate access to the Internet, photo sharing, instant messaging (IM), emailing and the usual voice and txt messaging that the smartphones bring. Virtually any space is now transformed into a collaborative learning space. Students often group together looking at online material, send each other files and photos, URLs and other digital information. Mobile video blogging has become a favourite activity and is an effective way to get out of studio information across in a short space of time.
2. The use of mobile web 2.0 provided a sense of current technology being embedded into the learning experience. In comparison, even though virtually all students in the third year course have access to their own laptop computers for use in the studio/class room, this is seen as standard these days. This project has facilitated a culture of mutual support, networking and collaboration among students, which also enhances students' skills in communication with their peers, academics and industry representatives.
3. Evenings see a sharp increase in student posts – often comments on each other's blogs as well as end of day reflective posts.
4. Students' editorial skills have increased due to the constant need to monitor the content of their blogs. A look over almost all of the blogs from the start of the project to today will show significant progression in what the students have learned about editing content and getting ideas across.

3. What are the key issues to successfully integrating this technology into courses?

1. Assessment and staff participation. We ran a 2007 project that did not carry an assessment weighting and the uptake was lower than for this 2008 project where assessment of the blog was embedded. It makes sense that

students want to receive credit for doing something that takes time, focus and commitment.

2. It is vital that staff participate in the blogging process and run their own blogs alongside the student ones. Students want to see that staff are visiting the blogs and commenting on posts as well as offering links to sites where students can pick up information that might assist them with their projects. This doesn't mean staff are required to comment on all posts but reading the blogs is important as students will often ask 'So what did you think of my last post then?'
3. This project allowed students to have the smartphones (and Bluetooth folding keyboards) and use them as if they owned the device, and they were also supplied with a 1GB data plan for the duration of the course. This ensured that participants had the tools they needed to work effectively. Therefore programmes need to provide the hardware or make it a compulsory course purchase to enable access.

4. In what way has your teaching approach changed by using this technology and tools?

1. Breaking down the walls! This encapsulates the thrust of this project.
2. As a result of integrating and assessing mobile blogging technology tools into the programme I have become far more tolerant of students working from different locations, something the class room/studio model struggles to cope with.
3. Putting time aside to read and comment on the content of each student blog is important and time during working hours needs to be allocated for this. By allocating time during the studio/teaching to work on the student blogs late night work at home can be kept to a minimum.
4. It isn't 'easy' working in this way but it is immensely valuable and exciting. I think that it would be very hard go back to traditional teaching only methods now I have begun to use blogging and mobile blogging.

Key Issues

The mobile web 2.0 integration project within the Bachelor of Product Design has highlighted several key issues.

The project has illustrated the potential to create increased student engagement with the learning environment.

Higher levels of student reflection and critique were achieved compared to that previously seen with more traditional assessment procedures.

Anywhere, anytime learning (context independent and context bridging) has been facilitated and made use of in unforeseen scenarios.

Tutor engagement with the technology is essential for students to value its use and to gain an understanding of its pedagogical usefulness beyond social activities.

The integration of the mobile web 2.0 technologies into the assessment (Both formative and summative) is critical for student motivation.

Access issues must be considered carefully when planning to integrate the use of mobile web 2.0 technologies. The sustainable provision of hardware, software and connectivity (3G data plans and wifi availability) must be thought through. Various models for achieving this sustainability are being brainstormed for the future of this project.

The integration of mobile web 2.0 facilitated a change in pedagogical approach, that needed significant scaffolding for both students and tutors. This made supporting the project via a Community of Practice, and sound pedagogical design essential.

Conclusions

It is very early in the life of the integration of mobile web 2.0 technology into the Bachelor of Product Design programme to draw many conclusions. However, both case studies showed that it has been very successful for enhancing the students and lecturers experience and facilitating a context bridging social constructivist environment.

Unfortunately, the benefits of mobile web 2.0 technologies are not gained without challenges. Using the technologies placed new and increased time, organisational, and pedagogical demands on the lecturers. Perhaps the most difficult of these challenges is the question of maintenance. Once a project is created and mobile web 2.0 technology is embedded in the context of a course, the lecturer often finds himself/herself responsible for supporting the resulting posting. While this may not pose a significant problem the first or even the second time it occurs, it can be difficult to manage over the year. Leaving it to the individual Lecturer to instigate such projects adds another complexity and challenge that may discourage many other lecturers from using the technology. This requires a change in time management and a refocus on regular formative feedback rather than the traditional summative end-of-project feedback and assessment procedures. When this is implemented the benefits for students and tutors in being continuously immersed in the projects is realized, creating much lower reliance upon end-of-project presentations and summative assessment.

A second challenge associated with the introduction of mobile web 2.0 is the number of courses adopting the technology within the same year. The major project is focused on individual student work. In contrast NPC course assignment focused upon a group project and required multiple participations from students. Because of the nature of these projects, it is often difficult to manage without creating a separate blog. Thus creating more work for the Lecturer, possibly reducing the quality of the final product and potentially reducing the quality of the

experience for the students. Using features of VOX such as tagging, RSS and groups can help to minimize this extra management load.

A final challenge associated with using such technology is that of consistency within the programme. Many of the projects are initiated from lecturers keen to use the technology to expand the existing knowledge base of the students. Leaving it to the individual Lecturer to instigate such projects adds another complexity and challenge that may discourage many other lecturers from using the technology. It is important, however, that Lecturers continue to provide the support on the type, scope, size, and pedagogical input of the mobile web 2.0 aspects of the projects that are introduced into courses. Creating a course-wide strategy for the integration of mobile web 2.0 within the programme that would enable all of the teaching team to support one another in supporting these innovations is a goal for 2009.

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