# RMIT University
Learning and Teaching Investment Fund 2009
Final Report
Due date is February 19, 2010 to your LTIF College Coordinator

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<tr>
<th>Project title</th>
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<td>Project leader</td>
<td>Emilio Badoer</td>
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<td>Jeremy Keens</td>
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<td>Team members</td>
<td>Garry Allan</td>
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<td>Denise Ellis</td>
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<td>students may need further clarification.</td>
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<td>• As a method of maintaining interest in lecture</td>
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<td>material by introducing variety into the</td>
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<td>The project was a success, and following it Dr</td>
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<td>Jeremy Keens and Professor Emilio</td>
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Badoer proposed research using PRS in both large and small classes. These projects were combined with the objective of setting a model for using PRS at RMIT.

The technology for student responses is undergoing rapid change. The original model is for dedicated numeric data entry pads connecting through radio-frequency to a receiver in a controlling computer. However, the expansion of ownership of mobile devices that can access the internet through a phone network or WiFi has shifted the focus. Netbooks, laptops, ‘smart’ phones and tablet devices now allow for immediate polling using a variety of software and systems.

A team comprising the two principle investigators and Dr Garry Allan and Denise Ellis assessed the available technology and identified that this shift was happening and that it would not be economic to make a major investment in the hard technology in the face of the development of individual access. A model was proposed that melded a slight increased investment in the current technology while p[ositioning RMIT to take advantage of the new developments. This was endorsed by the Educational Technologies Advisory Group.

The strategy has been implemented to date through

- Developing a fleet management capacity within the library system to allow casual users of the PRS to book keepads and receivers for use in their classrooms.
- Presenting the overall PRS approach at the RMIT TāL expo
- Following analysis of alternative options, negotiating with Turning Point Technologies for a trial licence to access the internet-based polling options. The initial trial identified issues which have been overcome and further trials are continuing]
- Extending the WiFi access through lecture theatres at Bundoora for this trial
- Developing training packages through RMIT training

To understand how RMIT students would accept the new technology, a survey was undertaken of 207 students in a range of programs at Bundoora. 50% have a phone that can provide internet access, and while 29% of those responding said they used it for internet access at RMIT, 77% would be willing to use one here, and 67% would be willing to use it as a PRS device in a lecture.

Rmit is now in a strong position, through staff involvement, training and interest in developing system to use PRSs as an effective means for improving the learning experience of RMIT students.
Introduction

In 2008 a Personal Response System (PRS, also known as Student Response Meters and as clickers) was installed in the large lecture theatre on Bundoora campus and trialled for seven weeks. PRSs are a method of obtaining immediate responses from students and of providing them with feedback based on multiple choice question models. PRSs can be used for:

- Formative questions throughout a lecture to allow students to assess if they understood particular aspects of the topic.
- Quizzes to assist in revision and reinforcement of knowledge.
- Assessment of the level of understanding students bring to a topic before the material is presented.
- Feedback to the lecturer on issues for which students may need further clarification.
- As a method of maintaining interest in lecture material by introducing variety into the presentations.

That project was successful and stimulated two submissions from the School of Medical Sciences from Professor Badoer and Dr Keens. The funding committee recommended that funding be given to a joint project looking at PRS implementation.

Amalgamation

The two projects were originally designed to approach the problem of using response system from different directions: the Badoer proposal looked at small classes using a mobile phone based system while Keens was an expansion of the original implementation to a broad range of staff using the lecture theatre. Dr Garry Allan was charged with bringing the two projects together with a common aim and structure.

Implementation strategy

Over the course of extensive discussions during the first half of 2009 the project coalesced around a number of issues that related to the preferred method of PRS implementation at RMIT based on both economic and pedagogical basis. The outcomes of these are discussed below.

1. Broad PRS implementation

   At the beginning of 2009 three main options for implementation were identified
- Hard wiring a number of lecture theatres in the same manner that 207.3.3 had been done on the Bundoora campus.
- Installing receivers in all/most lecture theatres and issuing students with the keepads either on an annual basis or from the library as required.
- Maintaining a fleet of keepads and receivers for ad-hoc use by staff.

These methods all referred to the original method of PRS use, where a radio receiver is attached to a computer in a teaching space, the students have access to some input device, and feedback is given via the lecture computer. However, the technology is advancing and there are now systems that use phones and other devices to carry out the polling. Prof Badoer’s application had incorporated the use of one of these systems - Votapedia.

A paper prepared by Denise Ellis for Garry Allan (Attachment 1) analysed the various options available for PRS. This report informed the early decision of the working party not to proceed with Votapedia but to build on using the TurningPoint technology which was already installed in Bundoora and had been the most common version of PRS purchased across RMIT.

Discussion then focussed on how best to scale up the use of PRS at RMIT. The economic and practical aspects of all three models noted above were discussed extensively. It had cost about $30,000 to install the system in one lecture theatre, and it was considered that this was not a realistic option across a significant number of lecture theatres. Hard install also negated some of the more sophisticated data management features of the system (such as tracking individual students or formal assessments). Models including issuing keepads to first year students at RMIT at Bundoora and/or the city and lecture theatre options were canvassed.

While this discussion was occurring we became more aware of the shift in the technology from a hard system to an internet based one. The expansion of laptop and netbook use throughout educational institutions and the emergence of ‘smart’ phones which have internet access through G3 or wireless had led TurningTechnologies to develop software for computers and phones. Either through a dedicated application (on Blackberrys and iPhones) or a website, students can interact with the questions. These give them a visualisation of the responses similar to that seen through the lectern-based computer/Powerpoint presentation, but does not limit them to being present in the lecture theatre, or limited to classrooms with receivers.

Discussions with representatives of Turning Technologies during the first half of the year clarified the availability and costing of the new developments.

The discussions and deliberations of the working party led to the development of a strategy for implementation of PRS that was presented to the Educational Technologies
Group (ETAG - at Attachment 2). This outlines the background (both financial and pedagogic) to the PRS technology and the proposed implementation - a combination of real and virtual PRS - and the steps that were planned for second semester. The proposal was endorsed by the ETAG.

**Actions arising from ETAG Strategy**

The ETAG strategy became the blueprint for the remainder of the LTIF and led to activity in a range of areas:

*Developing user interest and support*

The working party pursued a number of options for increasing awareness of PRS within RMIT and providing additional support. At the Learning and Teaching Expo a session was presented which outlined the PRS strategy, described the options available and demonstrated both the keepad and wireless versions of TurningPoint. PRS technology was also presented at an SEH seminar.

A website was developed which combines training material with descriptions of the use of the PRS at RMIT. This builds on the T&L website that was launched last year which included a section about Dr Keens’ work. This also provides access to ad hoc booking from the PRS fleet.

RMIT training participated in training provided by TurningTechnologies for staff interested in using the system, and they have been developing an online module which will be able to be accessed by staff who want to use PRS in classes.

Members of the working party, particularly Denise Ellis, have been involved in supporting staff who are starting to use the system - this included a formal assessment held in the Capitol theatre.

*Expanding the hard fleet*

As noted in attachment 1, there already existed a significant number of PRS sets within the university. A significant effort was made to centralise the systems as much as possible to provide economies of scale and broader access. This was generally successful.

In addition, as part of the LTIF funding an additional set of keepads and receivers was purchased, initially for use by Prof Badoer in the classes identified in the application, but they have now joined the RMIT fleet.

*Developing the library access*
When a decision was made not to hard-wire lecture theatres, a viable ad-hoc booking system had to be developed. Discussions with AV support and the Library indicated that the Library has the systems in place to make a booking system work - including moving keepad sets between campuses.

During semester 2 this became active, expanding with the increasing fleet numbers, and is now providing ongoing access to staff who are increasingly using the PRS.

WiFi expansion and Responseware trial

To provide equitable, low cost access to the ‘virtual’ PRS it is necessary to provide expanded WiFi access for students. This is because they will be using their devices to access the internet, so it is imperative that RMIT offer them this access without cost. The RMIT WiFi Network is the route through which students can get that access while on campus. However at the beginning of the year the coverage of lecture theatres was inadequate. Discussions with ITS eventually resulted in the network being switched on in the lecture theatres.

It was then possible to undertake a trial of the two internet options. RWPoll is a web-page which allows participants to see the questions, vote, and see the class response. This system worked without problem. Responseware is an application (currently for iPhone [the more common student device] and Blackberry) that allows quick and easy access to interactive site. Testing identified problems with the system which timed out when users attempted to log-in through the RMIT network - while working perfectly over 3G. This issue has now been solved and a detailed trial will be undertaken in 2010.

Survey of student phone use

Perhaps the most significant issue in relation to use of PRS through students own devices is how many can do it and how many will. While there is anecdotal information, there was no detailed analysis. Therefore a survey was undertaken of students in a variety of programs in years 1-3 at Bundoora, gathering 242 responses. The full report and analysis is at Attachment 3. However the key findings are:

- 49% of students have a phone with internet access (19% don’t know if their phone can)
- 35% use their phone for internet access and 18% say they use it for university related activity
- There was a fairly even split between those who used the RMIT WiFi network and their G3 phone providers network
- 77% would use their phone for internet access at RMIT, and 60% would take into account the requirements of the RMIT network when choosing their phone.
• 63% bring an internet/WiFi enabled device to university and 67% would be willing to use their device during a lecture to participate.

These findings indicate that the strategy to move towards PRS using the students own devices is viable as the proportion of students with smart phones and other devices is expected to raise in the coming years.

Outcomes

*Improved student learning experiences, outcomes and employment opportunities*
• Through provision of immediate feedback on prior and current learning the PRS provide for an improved learning experience. Student responses to the earlier implementation demonstrated the benefits. This project has led to a wider implementation with access in a variety of teaching situations which will expand the enhanced learning.

*Innovation*
• RMIT is at the forefront in implementation of web and smartphone PRS developments. TurningTechnologies has partnered with the University and provided us with one of the first licences for using the system in Australia, and the experience here has been valuable for the also

*Strategic alignment*
• The project met a variety of priorities within the strategic plan
  • A focus on active learning, using a technology which helps students to learn
  • Listening to students experience to develop enhanced teaching practices
  • A commitment to staff develop and sharing the learning across the university

*University wide application*
• Expansion of the PRS across the university has been the focus of the project, and the development of training resources ensures that this will continue. The system is also being used at our international campuses

*Value for money*
• By pursuing alternatives to the physical PRSs this project has identified a cheaper method of expanding PRS use at RMIT, while also ensuring through pooling and library management that the existing systems within the University achieve maximal usage.
Expenditure Statement

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Attachment 1

Report on Audience Response Systems
(While not formally part of the LTIF project it formed the basis for development of the RMIT strategy)
Report on Audience Response Systems:
KeePad™, Votapedia and SMSPoll™

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Date: 18/01/2009
Executive Summary

The past ten years has seen a prolific increase in the use of audience response systems in the higher education sector. This report compares two types of audience response systems, highlighting the strengths and weaknesses of each system. Consideration of these aspects is given from the perspective of a whole of university roll out of the technology.

Until recently these systems depended on specialist hardware devices, primarily designed for use in a synchronous context such as a lecture theatre with a "live" audience in real time, in order to gather feedback on students learning. The more recent development of web-based technologies has altered the capabilities and functionality of audience response systems. Feedback can now be gathered in both synchronous and asynchronous contexts using student’s mobile telephones, PDA’s and using web browsers on the internet.

The KeePad ™ product is dependant on infrared or radio frequency technologies. It is for use in real time in lecture theatres and classrooms. VotApedia and SMSPoll™ are dependant on internet and mobile phone technologies to facilitate audience response by any of three methods: SMS text messaging using a conventional mobile phone, web voting using a mobile phone with advanced capabilities including wireless connectivity and internet voting using a web browser on an internet connected mobile phone or computer. The report considers the capabilities and functionality of all three systems and makes a recommendation regarding the implementation of audience response systems at RMIT University.

Key Findings

Primary point: Not any one-audience response system will meet all the needs of all academic staff teaching at RMIT University at any one time.

Therefore, for RMIT and any other university considering adopting audience response systems into their teaching practices, it is advised that a blend of the technologies considered here in this report, be adopted.

Specialist devices: KeePad is a well reputed, long standing commercial provider of audience response systems that are dependant on specialised hardware and computer software. The company has had a presence in the majority of Universities in Australia for over ten years. It is recommended that there are appropriate teaching contexts where this technology has distinct advantages over web-based technologies.

Specialist devices are designed for implementation in small to large classrooms with a co-located audience. They do not facilitate response by remote audiences; they operate in a synchronous situation only. The advantages of specialist devices are that they offer superior control of response data, an excellent facility to identify voters using students’ lists in spreadsheets and excellent report creation functions. All response data is captured on the lecturers’ computer and remains confidential- there is no third party involvement with either the poll or the poll results. Anecdotal evidence from users at RMIT and other universities using this technology is that it is a reliable system with excellent capabilities to determine student pre and post class learning.

The limitations of specialist devices include: they confine the process of voting to “real time”, there are limited capabilities for poll question types- they are confined to multiple choice questions. The hardware of the system requires setting up and dismantling unless a dedicated teaching space is established. The input device is limited to specialist response cards that need issuing and retrieving. The product requires a significant financial investment on part the university in the initial stages of implementation and the input devices require minimal ongoing maintenance. Staff need training in the use of the product.

**Non specialist devices:** Web based systems that facilitate audience response by mobile phone text messaging and web polling, are currently being trialled and implemented in Australian Universities. While no one product has significant representation in the higher education marketplace, SMSPoll is proving to be aggressive in its marketing and willingness to lead. Anecdotal evidence gained while preparing this report is that Monash University, ANU, QUT and the University of Sydney are successfully using this technology. The University of Melbourne is in a trial process.

Non-specialist systems are primarily designed for implementation in either small or large classes with either a co-located audience or a remote audience. Advantages of these systems are that they allow for both synchronous and asynchronous voting. Polls can be multiple choice or free text. There are various processes available for casting a vote or inputting a response, including SMS text messaging, voting over the internet using a web browser on a smart phone, laptop, or PC.

Disadvantages of these systems are: that they are reliant on a third party telecommunications company for the processing of mobile phone SMS messages and internet votes. It is a time-consuming task to establish identification of individual responses. There is a cost incurred by the voter when using the SMS text meaning function of a mobile phone – however this is off set by the fact that many students have capped plans that bring the cost down significantly. The success of the poll is dependant on students having a phone, being prepared to use it in a teaching context for polling purposes and using it correctly. There are significant margins for error here.

Voatpedia is based on open source software and therefore has questionable product life cycle and technical support. The system enables web voting and voting by mobile phones however the data capture and report creation functions are limited. SMSPoll is also a product in some development however the vendor has based the product on technologies that are being used very successfully in universities in the U.K and the U.S.A.

**Finally:** Due to the various capabilities and functions of each system it is recommend that RMIT University adopt both forms of audience response systems described in this report. KeePad is designed for use with up to 200 students in a lecture theatre and in small classes. It is recommended where reliability of data input is important and security of the captured data is of concern. It is the preferred system to determine where learning has occurred in a session and for pre and post audience polling over a semester period.

SMS Poll and Voatpedia are recommend for use in large lecture theatres for audience engagement and use on the on the web to facilitate remote audience participation. Due to the high potential of operator error in the SMS texting process, the data captured would not be reliable enough to prove learning had occurred – but could be used to provide an indication.

It is the intention of the writer to address the project brief for the report – and it must be noted that for that reason - this report does not address issues relating to pedagogical motivations for the use of audience response systems, nor is any analysis given in depth to operator or voter experience of the systems.
Introduction:

This report compares two types of audience response systems that are currently being used in higher educational settings in Australia. Three products are documented: Information is provided on the specialist device system provided by TurningPoint™, product name: KeePad™, on the non specialist device, provided by Dr Ken Taylor from CSIRO, product name: VotApedia and I have included information on a commercial application of the Votapedia technology: product name: SMSPoll™

Both types of technology have many competing commercial providers in the market place.

There has been strong growth in the adoption of audience response systems (ARS) in the higher education sector over the past ten years. It is beyond the brief of this report to provide information on the pedagogy, effects and implications of ARS’s. The bibliography provides suggested further reading that incorporates these areas.

Audience Response Systems: Brief Overview

An audience response system provides for the interaction of a lecturer using a feedback loop in which a question is asked usually in the form of a power point slide – students indicate their response from a set of options on the slide by using a personal data entry device. This device can be in the form of a mobile phone using short messaging service text messaging or a dedicated piece of hardware – a clicker or keepad. In a lecture theatre, the responses (transformed data) can be projected onto a public screen, or alternatively on a web page on the internet.

In addition to collecting and graphically displaying data in real-time, most audience response system software suites also provide reporting functions that will help users analyze data after the presentation. These pre-formatted reports typically export into Excel or other common formats so you can give the data a more in-depth analysis. Reporting functions also make participant tracking and grading possible for those in a training and education environments.

Types of technologies

Infrared/ Radio Frequency response systems

ARS’s utilize hardware and software that is used in conjunction with face to face and remote educational processes to support and enhance learning. The literature on their use is vast and the technologies are continually developing to improve and broaden the capabilities of the systems.

Mobile Phone : SMS Text Messaging response systems

These systems collect SMS responses and display them through a web page. They don't require specialized voting hardware, but they do require telecom hardware and software, along with a web server, and therefore tend to be operated by dedicated vendors selling usage. This has the effect of shifting much of the cost burden to the audience (if they don't have a free SMS plan). Computing devices with web browsers can also use these services through SMS gateways, if a separate web interface isn't provided.

Web Browser response systems

An emerging technology, browser-based audience response systems are in the early stages of development. It is usually sold as a software-only system, compatible with the client’s existing wireless devices. Only one copy of the software is required, which resides on the facilitator’s computer. When the facilitator creates a polling session, an IP address is assigned to that session. Participants log-in to that IP address through their own computer or Pocket PC. The data is transmitted via wi-fi Internet from the participants’ wireless devices to the facilitator's machine, where the data is stored. The data is then displayed to the audience through the projector and also on each participant’s hand-held device. Because the transfer of data goes through an IP address, proximity to a base station or line-of-sight is not an issue. As long as the individual has Internet access, he/she can participate.
Products: Overview

KeePad™ - TurningPoint™ ARS: Specialist device: for polling using specialist response devices

The TurningPoint Audience Response Systems are available in Australia through the company KeePad Interactive, Sydney. This audience response system is used with co-located audiences (i.e. in the lecture theater) – in real time. Small hand held response devices with wireless communications to a base station located in the lecture room, are issued to students. Multiple choice questions (MCQ’s) are put to students on a PowerPoint slide and students activate the response card with their choice. Results are graphically shown to the audience in a PowerPoint slide.

Surveys can be conducted in approximately ten seconds and the results are incorporated into the lecture without interrupting the flow of the presentation. This is made easier by running the surveys within power point presentations so that a presenter can ask a question and display the tabulated results as part of the presentation.

Open source wiki: VotApedia. Non specialist devise: polling using a cell phone – VotApedia is an audience response system that doesn’t require issuing clickers or need specialist infrastructure. Known users can create surveys and create polls. It has been developed for use with co-located audiences but also works with remote audiences. Calls are free.

Commercial providers include SMSPoll™ & Poll Everywhere™. Non specialist devise: polling using a cell phone
Web audience response systems are used for creating surveys (polling) for face to face or remote audiences. Students vote by sending a text message or by ringing a particular number - then selecting options using an interactive voice response system. Polling responses are displayed on a web page.

These systems are designed as a communication platform, between a web user (system operator- lecturer), and a group unlimited in size of cellular phone users (students). This form of audience response system does not require dedicated hardware and polls are not confined to co-located audiences. It uses mobile phones to collect audience responses to multiple choice questions posed by the lecturer. It enables a single person (the system operator) to initiate two-way communication with groups of cellular phone users. Significantly: it provides both synchronous and asynchronous exchange of information. Computing devices with web browsers can also use these services through SMS gateways.

Terminology:

Alternative names for audience response system

- student response system
- classroom performance system
- personal response system
- classroom response system
- remote response system
- wireless response device
- group response system
- interactive response system
- electronic voting system
- classroom communication system
- response systems

Alternative names for handsets

- handsets
- clickers
- zappers
- keypads
- response pads
Specialist devices: Keepad

Features
- Human interaction supported by equipment is in real time (i.e. synchronous).
- Interactivity is one directional: is one optical and one is electronic.
- Uses radio or infrared transmission combined with wireless hardware.
- Turningpoint software is customizable with Microsoft PowerPoint software: adapt existing presentation slides or create new ones using the add-in toolbar.
- TurningPoint Parser software integrates with Microsoft Word.
- Responses can be anonymous or participant lists can be created.
- The participant monitor enables the lecturer to see how the group is responding to the questions.
- Response Data presentation: wide variety of options available, on the fly review and data comparisons can be displayed at any time.
- Response reminders integrated into question slides: prompt respondents to activate a response.
- Teams scoring available.
- Compatibility with Blackboard: the Learning Management system. As all of the software used to create, present and record responses is based on Microsoft Office applications: files are saved and can be uploaded into Blackboard.

System Components: Hardware

Response cards:
- Wireless handheld transmitters (for individual or group use): the size of a credit card, transmit data from the keypads to the base stations.
- The most cost effective infrared keypads have a range of 25 meters with line of sight required: suitable of a smaller room setting.
- For large class teaching radio frequency keypads have a range of 80 meters without a line of sight required.
- User Input: 12 key (1(A) - 10(J), Go/Login.) • Answer Key - answers transmitted automatically.
- Display: Successful transmissions are acknowledged on the participant's keypad via a three second long visual green light signal.
- Power & Power Management: • Powered by two coin cell CR2032 (3.0V) Lithium Batteries, • Always in deep sleep mode - only uses power when a button is pressed. • Average battery life is 6 to 12 months.
- User Identification: Select participants in less than 5 seconds.
- RF Technology: Available Channels: Up to 82 sessions can be running at one time in close proximity without interference, Will not interfere with other technologies.

Receiver
- A transportable device that receives signals from the response cards, set up at the front of the lecture theatre, linked by cables to the laptop.
- Range for one receiver is approximately 60 meters.
- Receiver Dimensions: 2.8 cm W x 9.4 cm L x 1.1 cm H, Unit Weight: 29 grams.
- Recommended capacity of 1000 RF Keypads per one receiver.

System Components: Software
- TurningPoint software can be loaded on as many computers as needed a
- Only the receiver is needed to be activated to use the keypads (The License Code is activated on the Receiver).
- Complete Microsoft Office integration: PowerPoint, Word, Outlook, Excel.

System Architecture

Image 1: Graphical depiction of classroom set-up using infra-red or radio frequency: e.g. Keepad
Computer requirements

TurningPoint 2006 requirements for software:

TurningPoint 2006 and TurningPoint 2008 minimum requirements for hardware:
- Intel or AMD 600 Mhz class processor (1 GHz or higher recommended), 256 MB RAM (256MB or more of "available" RAM recommended), 60 MB hard disk space (an additional 32 MB is required if you do not have Microsoft .NET Framework 2.0 installed), Microsoft .NET Framework 2.0 (requires additional 32MB of hard disk space), 1024x768 resolution at 32-bit color or higher, Standard USB 1.1/2.0 port, Ethernet or 802.11 compatible wireless network card.

TurningPoint for MAC minimum system requirements:
- G3 processor or better / Intel processors fully supported (Universal Binary), 256 MB RAM (512 MB recommended), 10 MB hard disk space, Mac OS X 10.3 or higher in English, Microsoft Office 2004 for Mac in English, Available USB 1.1 or USB 2.0 Port.
- Note: TurningPoint for Mac is not compatible with Office 2008

Packaging
- The Keepad Top Load Carry Cases are recommended to hold 30 RF or IR keypads in the small case, 50 RF or IR keypads in the large case and 42 XR keypads in the XR case, as well as the Receiver and the software disk.
Technique
- Response cards are distributed, lecturers present an interactive PowerPoint session, a multiple choice question (MCQ) is displayed with up to 10 alternative response options, allowing students to answer questions using their personal Response Card. (keepad)
- Students contribute their response anonymously either individual or in sub-groups
- Responses are collated and graphically displayed on the screen in real-time for all students to see, whilst individual responses are stored for future reporting.
- Everybody sees the consensus or spread of opinion, knows how their own response relates to that, and has been able to contribute while remaining anonymous. (It is like a show of hands, but with privacy for individuals, more accurate and automatic than counting, and more convenient for multiple-choice rather than yes/no questions.
- Provides synchronous exchange of information: 1-way only (student to lecturer) - No information is provided back to the keypad apart from the green confirmation signal

Results data
- on the fly review and data comparisons can be displayed at any time
- a priority ranking slide allows students to respond multiple times to a question, the responses are weighted and ranked accordingly
- ranking wizard allows the creation of lists of items, issues etc and rank them against a static scale or against each other using a “paired comparison”
- demographic comparison slide visually displays the results of the question in terms of demographic information gathered from the audience
- comparative linking tool enables lecturer to pose a question and then later in the presentation pose the same question again – automatically displaying a side by side comparison of results
- graphical slides: objects can be linked to responses: For maths courses – Microsoft Equation Editor objects can be used
- various multiple choice results slide templates are available
- various team participation slide templates are available

Operation
Before the session:
- Software: install & activate Turningpoint add-in on personal computer, prepare PowerPoint slides with MCQ's embedded & Excel spreadsheet for data control and creation of response reports after session
- install & activate Turningpoint add-in on lecture theatre computer
- Hardware: set up infra red receivers in lecture theatre, connect Turningpoint receiver into USB port on computer

At the session:
- Prepare the laptop and receivers (3 mins).
- supervise distribution of the response cards. (Tip: with large classes (200-300) it is advisable to have assistance from one or two students
- Lecturer brings the questions; on the spot questions can also be used.

During the session:
- Lecturer displays a multiple choice question using an OHP, blackboard, or PowerPoint.
- Students each submit an answer using their handsets
- After the elapsed time (e.g. 60 seconds), the software displays (projected on the screen) a chart showing how many individuals selected each answer option.
- Lecturer then comments on the answer, starts a whole-class discussion, starts small group discussion, or moves straight on

After the session:
- collect response cards and pack up hardware
- manage response data: create response reports in Excel if required
Data Capture and report creation

- reports wizard is available to assist with report creation
- functionality and formatting is consistent with Word and Excel
- Types of reports: results by question report, graphical results by question report, demographic comparison report, results by participant report, participants results report, plus 17 other report types
- Data slicing, conditional branching, comparative charts, word parser and worm response meter are all available

Training

The purchase quotation includes pricing for Turningpoint ARS, training and annual support and warranty agreement. (ASWA) Training is vital in providing the skill set, confidence and competency

Three types of training are available:

- Basic: delivery is web based or onsite, option modules include methodology module, tricks and settings module, 75 minutes plus 30 minutes per option, Trainer to student ratio: 1:1 to 2, no certification
- Standard A, Onsite: includes methodology module, tricks and settings module, 3hrs, Trainer to student ratio: 1:2 to 8, certification
- Standard B: Onsite includes methodology module, tricks and settings module, 3hrs, Trainer to student ratio: 2:4 to 8, certification

Completion of training allows users to obtain service desk support.
Certification for standard training will result in inclusion on the Certified Turningpoint Users Register

Support and Product Upgrades: Life Cycle of Technology:

- The Annual Support & Warranty Agreement (ASWA) provides 12 months Software Support, 12 months warranty protection on Hardware and Service Desk support between 9am and 5pm on business days in Sydney.
- ASWA is compulsory for the first 12 month period to support customers in the skillful operation of the Keepad System. Annual extensions are available and highly recommended. Support will only be provided to individuals that have completed Keepad Training.
- ASWA will give you free Minor & Major Software Version Upgrades (Software Assurance) in accordance with our Terms & Conditions.
- ASWA provides full warranty protection (misuse, loss etc aside) on all hardware.
- The Service Desk will provide Service Desk Support with a limit of five (5) support calls of 15 min blocks on any single Support Issue within a one month period.
- There is no limit on the number of different Support Issues.
- ASWA needs to be continuously renewed in order for Software Support and Warranty to be applicable. ASWA entitles discounts for additional Keepad Product, and a range of services including Hire Services and Training.
**Cost:** Kits can only be purchased or leased

**Purchase**

For 30 keypads:
- 1 Base Pack RF (Incl. RF Receiver & TurningPoint base software licence) 495.00
- 30 ResponseCard RF keypads (incl. TurningPoint licence) 75.00
- 1 Keepad Carry Case 60.00

0 Keepad Lanyard and Pouch Bundle 2.90 -

1 Annual Support & Warranty Agreement 20.75
1 Basic Training Onsite or Web based 60.00
1 Shipping and Handling 30.00

1 Volume Discount Total Fleet 510 RF keypads -80.64 - 80.64

Sub Total 3,535.11  GST 353.51
**Total Including GST 3,888.62**

For 200 keypads
- 1 Base Pack RF (Incl. RF Receiver & TurningPoint base software licence) 495.00
- 200 ResponseCard RF keypads (incl. TurningPoint licence) 75.00
- 4 Keepad Carry Case 60.00

0 Keepad Lanyard and Pouch Bundle 2.90 -

1 Annual Support & Warranty Agreement 1,390.50
1 Basic Training Onsite or Web based 60.00
1 Shipping and Handling 30.00

1 Volume Discount Total Fleet 680 RF keypads -428.14 - 428.14

Sub Total 17,087.36  GST 1,708.74
**Total Including GST 18,796.10**

These quotations were provided on Dec 15, 2008 All Quotes are valid for 21 days (from date of quote)

Please see all 5 file attachments for official quotations:
RMIT 3994 30RF.pdf, RMIT 3995 200RF.pdf, Spec Sheet RF.pdf, TurningPoint Order Terms AUD.pdf, PQuotationAttachment.pdf

The purchase quotation includes pricing for Turningpoint ARS, training and annual support and warranty agreement. (ASWA). The ASWA is compulsory for the first year

Alternative to purchase: Leasing:
An annual license and users agreement is provided as an alternative to purchase
It provides
- Full use with support for 12 months
- An ability to terminate at the expiration of any 12 month period
- Substantial 20% rebate of the Annual License and Use payment upon each annual renewal
- A hedge that allows clients to upgrade to newer technologies if desired
- Conserves cash flow
- Better matches use with expenditure
- Allow clients to maximize the number of RF Keypads and Receivers against available funding

**Sales Terms & Agreement**

LTIF Report: Badoer/Keens 2009
The ASWA is compulsory for the first year, it includes:

- Service desk support (help desk support during business hours AEST)
- Discounted after hours service desk support
- Minor software updates and patches notification
- Software assurance: Major software version upgrade entitlement at no cost
- Hardware warranty service
- Discounted keypad battery & maintenance service
- Purchase Top up keypads at current bundled price
- Receiver code activation or replacement fee waived
- Dry hire and wet hire discounts
- Training discount
- General presentation consulting services discount
- Support notes and circulars
- Email & fax access to KEEpad Technical support

Contact details
Sally Bateman  Keepad Interactive  FREECALL: 1800.463.279 - sbateman@keepad.com

KEEPAD Interactive
www.keeepad.com
sales@keeypad.com
Corporate Headquarters:
42 Richmond Road
Homebush, NSW 2140,

Market competition in Australia:
IML Interactive Pty Ltd
Clikapad® portable radio frequency keypad voting system
Quotation supplied: 30 handsets $10, 780.00  200 handsets $36,091 see attached document for details – specifications etc

Usage at RMIT:
Keepad has been used extensively on the School of Engineering and also in Business
Keepad supplied these concatas for registered users at RMIT

The School of Engineering has purchased 30 keepads
Contact Mr Graham Timmins: Senior Educator/Program Manager-Nursing
School / Work Unit Life & Physical Sciences Portfolio Science, Engineering & Technology

The School of Business Dr Konrad Peszynski Position  Senior Lecturer
School / Work Unit Business Information Technology Portfolio Business
**VotApedia** is an audience response system that does not require the issuing of Keepads or need specialist infrastructure. It is a web based technology platform, providing its users with the ability to execute a variety of real time survey scenarios, employing text messaging (SMS).

The system is designed as a communication platform, between a web user (system operator), and a group unlimited in size of cellular phone users. It is a web based operational interface, to be used anywhere, requiring only an Internet connected PC. It uses mobile phones to collect audience responses to multiple-choice questions posed by presenters, and the system is able to collate the responses and display the results.

The aim of the system is to enable a single person (the system operator) to initiate two-way communication with groups of Cellular phone users. It is still new, developed by CSIRO and ANU: Current users are ANU, Sydney Uni, QUT and individual lecturers elsewhere in Australia

**System Architecture**

Image 2: Graphical depiction of Votapedia using SMS text messaging

![Graphical depiction of Votapedia using SMS text messaging](image)

**Features**

VotApedia is intended for co-located audiences but also works with remote audiences

The system operates as web service with a presenter accessing the service through a web browser.
It also provides for poll results by SMS- where a presenter does not have access to an internet connection. The service is delivered through a wiki and associated web services. It is open source software and is free to use.

The service uses the telephony services of a 3rd party

- Removes the need for specialist infrastructure -implementation of the system does not require any dedicated hardware, but rather it extends the range of uses and benefits of existing hardware using internet connected PC’s, and cellular phones.
- a cost will not be incurred by students who vote using SMS texting by mobile (free for students to vote: calls are to an engaged number )
- Provides both synchronous and asynchronous exchange of information

**Capabilities shared with commercial providers**

- Intended for co-located audiences but also works with remote audiences
- System runs on a PC with an internet connection (for demonstrating live polling results)
- uses mobile phones to collect audience responses to multiple choice questions posed by presenters, collate the responses and display the results
- Computing devices with web browsers can also use these services through SMS gateways smartphone/mobile web voting: respondents can use the web on their mobile device instead of sending a text message to respond to a poll
- results are accessible anywhere / anytime via website,
- The poll that is embedded within the power point presentation or web page will update in real time.
- unlimited number of polls can be created
- One-way SMS messages are used for providing information or instructions to the group.
- Four types of questions: Single Choice, Multiple Choice, Open end and Open end- numeric
- Global SMS coverage: able to communicate 2 way with most cellular phones
- Online Database: This service gives access to data such as incoming calls, messages and data created by other services. Check the structure of our database so that you can construct your query. You will be provided with a dynamically generated view of the database that is consistent with your current authorisation.
- Configure Phone Services: is a web configurable service that initiates actions in response to incoming phone calls and SMS messages.
- There are a number of phone numbers that are monitored by an application that listens for incoming calls (through the Votapedia PABX . When a call is detected, this application checks the database to see if any actions are associated with the called phone number, and executes the relevant actions.

**Telephony**

- There are a number of phone numbers that are monitored by an application that listens for incoming calls (through the Votapedia PABX . When a call is detected this application checks the database to see if any actions are associated with the called phone number, and executes the relevant actions.

**Capabilities not shared with commercial providers**

None

**Capabilities Not yet Available but in development**

- Ability to manage an unlimited number of questions at the same time.
- A module for managing lists of contacts, including details, with the ability to direct messages and questions to a segment of the group
- Ability to break down the results using the attributes of the survey participants, and their answers to former questions
- Graphical display of the results of each question, the choice of format is limited column etc
- Students can not be allocated a dedicated number for multiple polls in one session

**Computer requirements**

**Hardware**

Poll Set up : PC or Mac with Internet connection

In class : PC or Mac: with Internet connection if using the poll on a web browser , As the poll is posted on the web: Internet connection is not essential in lecture theatre to run the poll (only if lecturer wants to display the results)

**Computer requirements Software** –

M/S PowerPoint to display the poll within a PowerPoint slide (optional)

Wed browser: to display the poll and results (live) (optional)

M/S Excel – to create response data reports (optional)
Addin for PowerPoint: LiveWeb

OpenOffice – compatibility To Be Advised

**Functionality**
A two-way text-messaging platform, intended for co-located audiences but also works with remote audiences. The system is structured as a full end-to-end solution, supporting the entire process of communication between its operator and the group –
- it includes group management facilities, messages and questions input interface,
- processing of the results (the group answers to a question initiated by the operator),
- display of the distribution of answers,
- output analysis tools,
- distribution of results by Email and SMS, and
- data storage facilities.

**Poll Formats available:** publish a poll in either of 2 formats:
- Multiple choice polls: define a list of possible answers. Graphs will display the results in real-time
- Free text Poll: the audience can text in anything

**Functionality**
Lecturer: (operator)
- Computer with internet connection: the web server resides on or is accessible to the lecturer’s computer, they control a set of web pages presenting questions
- Create a register of voters
- If you want to integrate your survey to your powerpoint presentation by operating the survey from powerpoint, you should first put a LiveWeb add-ins into your powerpoint

Students (participants)
- Utilizes student personal technologies: conventional mobile phones, advanced mobile phones (smart phones) and Pads: and mobile telecom networking services
- SMS chat facility displays incoming texts in a scrolling whiteboard format
- Students can log in to the server using a web browser and see the questions with forms to input their responses.
- Asynchronous usage: Polls can be made available for a fixed period of time on a website. Students vote using SMS or log into website - at any time in the polling period

Synchronous usage: In a lecture theatre: System utilizes student personal technologies: (access to mobile telecom services is needed by students) Suitable devices include conventional mobile phones, advanced mobile phones (smart phones), PDA’s, notebook and laptop computers

Set up
Create a website login at VotApedia
Establish caller ID
Create a poll.
Set the duration of the poll – there are no parameters set by VotApedia for the duration of polls
Customize and share the poll post into a blog, wiki
Set Voting: Ways to vote

**Technique**
Before the class
Lecture creates the poll at [http://www.votapedia.com](http://www.votapedia.com), set duration and Caller ID if required
Embed the poll into a PowerPoint presentation if required
Once a survey is started: started the survey, there will be a telephone number associated with each choice. Part of the telephone number is coloured red. This red number associated with the SMS method of entering the vote
At the class
Students with mobile phones should access CallerID and register (this can also be done in advance of session)
Students have the 4 options to vote: if using a conventional mobile phones: send an smsSMS or phone the selected number If using a smartphone, PDA or laptop open a web browser and select choice
You will need an internet connection to view the poll results on a web browser of in the PowerPoint presentation
After the class
Reports can be created if required
• a vote will be displayed within 2-5 seconds- the delay depends on the voter's cellular carrier and how long it takes to route an SMS message to a SMS gateway, web servers, and finally on to live polls wherever they are being viewed.

• Any time delay depends on the voter's cellular carrier and how long it takes to route an SMS message to a SMS gateway, web servers, and finally on to live polls wherever they are being viewed

• Once counted, the vote is displayed in real time on-screen

• poll does not need to be displayed to actively receive votes, but it does need to be "opened" by the presenter on the web page to be activated

Voting:
For MCQ's there are four ways of entering the vote for an active survey.

Dialling the telephone number provided

• Voters dial a telephone number associated with their choice. They can use a landline or a mobile to vote. Voters will hear two times of dial tones, then a busy line. That means that their vote has been accepted by the system. However, a phone number either a land line or a mobile is only allowed to vote once per survey.

Through the web

• Voters can also vote anonymously through the web. They can only vote once using the same machine (IP address). They can vote for a survey by logging in first. It is also allowed only one vote for a survey from one login ID.

Go to an active survey page

• Vote for the survey by clicking one of the buttons next to the choices to enter a vote

Sending SMS

• Voters can also vote by sending an SMS containing the red number associated with your choice to the following number: +61416906973

For Text Response questions

• They can either send the answer by SMS or submit the answer on the web page.

• This type of survey deliberately seeks longer answers, but due to the limitation of SMS, the answer can only be less than 255 letters.

Results – Viewing and sharing

• Embed the poll results widget into your blog or website.

• Download the poll results as a spreadsheet and share that file

• Poll can receive votes even when you do not have a live internet connection but to display the poll or view results in real time, the presenting computer must have an internet connection.

• When viewing the results, there is a link to download a spreadsheet version. This file can be opened by any spreadsheet application like Microsoft Excel.

Identifying Voters

• If multiple voting is set to no in survey creation, Caller ID is used to identify a voter and the number of votes a voter can make is specified in the tag "votesAllowed" which is most often set to 1. A voter who votes more than the number of "votesAllowed" will overwrite previous votes with subsequent votes in the order that they first voted. This allows voters to change their mind and update their votes during a survey.

• Caller ID is usually not transmitted between different countries. Thus if multiple voting is set to no, phones with CallerID disabled or calling from outside Australia will not be able to vote.

Privacy Webpolling

• The poll’s question (but not your results) is indexed by search engines unless you disable this setting in your preferences.

• With indexing turned off, polls are private unless you share the the secret poll URL (web address) with others, or embed the poll widget in a website.

• When you share the poll's URL, only the poll's owner can see the controls on the right, view the detailed results, or correlate answers between polls

Anonymous Web Voting

• When the voter votes through the web, the vote is anonymous, if he/she enters his/her vote for a survey without logging in first. If you do not want this to happen in your survey, you need to un-tick the enable to vote anonymously option in the advanced survey creation page.

Survey Types

Simple Survey

A simple survey is a survey with only one question in it, mostly used for presentations. Some options are available in the advanced survey creation page, e.g. the author can set whether to
display the graph during the survey. You can also change the options by editing the survey page before the survey starts. With this service you can build your own surveys, then ask your audience to vote using mobile phone, SMS message or web forms. Learn more

Questionnaire
A Questionnaire is a survey with more than one question in it. If you have several questions to ask your audience, use this type of survey instead of the simple survey so that you do not have to wait everyone to finish one question and then go to the next one. Like a simple survey, this type of survey also provides some options in the advanced survey creation page. You can also change the options by editing the survey page before the survey starts.

Quiz
A Quiz is a survey designed for student assessment. The questions and choices have the same syntax as the questionnaire, which means you can have more than one questions in it. The only difference is that you can allocate certain points to each question and define a correct answer so that participants get the points if they choose the correct answer. In this type of survey, others can’t see the quiz page before it starts and the wiki source is only visible and editable to you (the author). After the quiz finishes, you can check the answer of all students, and students can check their score by visiting the quiz page. Like a simple survey, this type of survey also provides some options in the advanced survey creation page. You can also change the options by editing the survey page before the survey starts.

Text Response
A Text Response is a survey designed for open questions. Unlike the Simple Survey or Questionnaire, which offer a number of choices, the Text Response do not any choices defined and the audience can answer whatever they like. They can either send the answer by SMS or submit the answer on the web page. This type of survey deliberately seeks longer answers, but due to the limitation of SMS, the answer can only be less than 255 letters.

Rank Exposition
A Rank Exposition is a survey for an audience to assess a series of expositions on a conference, seminar or students presentation. The choices is only for members of the audience to tell how good this exposition is, thus generating a mark for the current exposition, eg. excellent, good, bad. In this kind of survey, instead of displaying the number of votes of each choice, a list of top N expositions is displayed on the survey page (N is a number that can be set in the advanced survey creation page).

Data Capture – report creation
Pear Image Graph Package software is used to produce graphs.
There are four graphs in the system.
the display graph displays a graph after a survey has been created and before it is started.
the dynamic graph displays the survey’s results in real time.
the finished graph displays the survey’s results after the survey has been finished.
the stacked graph which displays a graph that shows results of two combined survey’s results (group survey2 by survey1).

Alternative uses of the system:

While the "classical" operation of the system is as a messaging platform serving a Web based user (system operator), communicating with a group of mobile Cellular phone users (participants), there are alternative uses of the system:
Mobile operator - a mobile user, using either a WAP Cellular phone, or a simple SMS, can operate the system. Results are delivered back to the operator in SMS format.
Immediate and automatic distribution of the question results to a group of Cellular phones, in SMS format - the operator can define a group of peers, who will receive the results once a survey is completed, both to their Email boxes, and to their Cellular phones.
Sequence initiated by the participant - The system can respond to a simple SMS message sent by any person. Sending a specific code word to one of the gateway Cellular phone numbers, can initiate the immediate process of communication of a sequence of messages and questions to this person. This facility is relevant for Trade Shows (any visitor can send a specific message to a number displayed in a booth or billboard, and will receive automatically a string of questions), or for self personality tests.
Product Development:
First trialled at the ICT Centre Conference 8-9 November 2006
Development is spasmodic due to funding limitations
VotApedia was developed as a special report under a government fund granted to Dr Ken Taylor of CSIRO
It’s a collaborative project of both the CSIRO and the Australian National University
Current users in higher educational contexts are ANU, Sydney Uni, QUT and individual lecturers elsewhere.

Support
• Online support is available by email from the creator Dr Ken Taylor and is dependent on his work load – expected a turn around is a few days by email

Life Cycle of the Technology
This product is evolving slowly. It is being adapted to incorporate developments as they occur in mobile phone technologies by
Being a wiki – it is open to input from any interested parties and several educators and scientists contribute on a voluntary basis.
The product was originally created as part of a special government grant to CSIRO – there are no immediate plans to develop this product in an aggressive manner.

Training: not provided
Non Specialist devices: SMS voting with web and mobile web voting: SMSPoll

Commercial providers: SMSPoll™ and Poll Everywhere™

In this document the term “the company “ will refer to the commercial service provider in a generic sense. It refers predominantly to SMSPoll (Australia) but some information on functionality from Poll Everywhere is incorporated. The Poll Everywhere product originated.

SMSPoll and Poll Everywhere are audience response systems that utilize mobile phone text messaging systems. Increasingly mobile phones are becoming technologically sophisticated with smart phones providing advanced functionality. This type of audience response works well for live audiences. Like Votapedia, these systems uses mobile phones to collect audience responses to multiple choice questions posed by presenters, collate the responses and display the results.

Features
Web based polling is intended for co-located audiences but also works with remote audiences. SMS voting People vote by sending text messages to options displayed on-screen. The system operates as web service with a presenter accessing the service through a web browser. The service is delivered through a website and the telephony services of a 3rd party: British Telecom.

- Removes the need for specialist infrastructure- implementation of the system does not require any dedicated hardware, but rather it extends the range of uses and benefits of existing hardware using internet connected PC’s, and cellular phones.
- A cost may be incurred by students who vote using SMS texting by mobile (dependant on the plan the individual student has with the service provider)
- Advanced uses include texting comments to a presentation, texting questions to a presenter, web voting, and SMS interactivity in print, radio, and TV.
- Provides both synchronous and asynchronous exchange of information

Capabilities:
- System runs on a PC with an internet connection (for demonstrating live polling results uses mobile phones to collect audience responses to multiple choice questions posed by presenters, collate the responses and display the results
- Computing devices with web browsers can also use these services through SMS gateways
- Smartphone/mobile web voting : respondents can use the web on their mobile device instead of sending a text message to respond to a poll
- Multiple choice & free response polls are available
- The poll that is embedded within the power point presentation or web page will update in real time.
- Results are accessible anywhere / anytime via website, can be sent to mobile phone
- Unlimited number of polls can be created
- Web Polling: Users can vote using the the web: and see results on the web
- Publish the results by adding voting widgets on to your web site blog or wiki
- SMS is ubiquitous on mobile phones, and works in extremely low signal areas

System Architecture
Image 3  Graphical depiction of an e-voting system using of 3 types of voting

LTIF Report: Badoer/Keens 2009
PC – Web Voters, PDA or Smartphone – WAP voters - Mobile phone-SMS voters

Note: Commercial vendors of e-polling systems provide access to the web server, SMS server, (for processing incoming “votes”) and the DBMS – for processing the polling, providing a digital result message that is available back through the webserver.

At this stage the results are not pushed back to incoming devices using WAP or SMS.

Key:

**DBMS**: Database Management System

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System Components

Telephony:
- SMSPoll owns a dedicated number in Australia that allows users/voters of all polls across SMS Poll to send their votes to.
- Most other commercial providers of SMS polling rent shared phone numbers and essentially what this creates is a less effective form of voting where generally more errors occur. Because they own a shared number, they then need to purchase a unique identifier - which is generally a word - such as 'VOTE'. This then needs to be added to the body of the SMS as well as the voting number. e.g VOTE 1234
- Respondents' mobile carrier routes their text message to a web servers operated by the company - where the vote is counted.

Information credibility and reliability
- Because the SMS gateway is sitting on British Telecom services we give a 99.99% guarantee that the message is delivered by our software.
- We have tested the system/software thoroughly in large audiences (and we continue to monitor this) and have verified that data is captured and reported accurately.

Software:
SMS Poll is 100% their own Intellectual property
The software has been designed and built by them from the ground up.
This allows them to add new features and scale the offering with no external forces/restrictions and to also meet any special requirements our clients may have in order to ensure the product/service meets their needs - both now and ongoing in the future.

SMS Texting messaging
- Poll Everywhere or SMSPoll is not primarily an SMS marketing or campaign management tool - it is a data collection tool.
- It conforms to current Mobile Marketing Association Best Practices.
- The nature of SMS text message interaction with Poll Everywhere or SMSPoll is transactional, not subscription-based.
- Poll Everywhere or SMSPoll only sends text messages to mobile phones in immediate response to a Mobile originated message.
- These messages serve to confirm that a Mobile originated message was received, and in some cases, provide additional follow-up information.

Web voting:
- Smartphone voters can browse to a website to avoid text messaging fees.

Developments in progress
- Providing the students with a 'text back'. An SMS can be automatically sent back to the voter's mobile number once a vote has been received. Generally the SMS provides meaningful content, you could send the student x number of SMSs throughout the term with extra tips, tricks or even study advice. This would be provided as 'extra' or 'exclusive' information to those students who have participated in a poll. So, in return for the minimal cost of their vote - they would receive exclusive content via SMS in return.

Capabilities Not yet Available
- One-way SMS messages used for providing information or instructions out to the group.
- No module for managing lists of contacts, including details, with the ability to direct messages and questions to a segment of the group- (under development)
- Configure Phone Services: is a web configurable service that initiates actions in response to incoming phone calls and SMS messages.
**Computer Requirements**

*Works on*: PC: or MAC : Windows/ Linux

The poll is posted on the web: Internet connection is not essential in lecture theater to run the poll (only if lecturer wants to display the results)

Software required by operator –

- MS Powerpoint to display the poll within a PowerPoint slide (optional)
- Wed browser: to display the poll and results (live) (optional)
- MS Excel – to create response data reports (optional)
- Adobe Flash Player **version 10** (this is not installed campus wide – at time of writing this report)

**OpenOffice**

There is no direct support for the presentation software that comes with OpenOffice, you can still display your poll from a web browser on a projector or switch your poll into fullscreen mode to occupy the entire screen. Also, although OpenOffice can read and write Microsoft PowerPoint files, it cannot currently display our polls even when they are present inside of a Microsoft PowerPoint file. Support for OpenOffice may emerge in future updates to Poll Everywhere

**Functionality**

Lecturer: (operator) needs

- Computer with internet connection: the web server resides on or is accessible to the lecturer’s computer, they control a set of web pages presenting questions
- Access to a telephony system that process SMS responses: these services are usually provided by dedicated 3rd party vendors selling usage (SMSPoll or Poll Everywhere)

Students (participants)

- Utilizes student personal technologies: conventional mobile phones, advanced mobile phones (smart phones) and Pads: and mobile telecom networking services
- SMS chat facility displays incoming texts in a scrolling whiteboard format
- In a lecture theater system runs on a PC connected to a mobile phone via a serial cable for gathering text responses
- Students can log in to the server using a web browser and see the questions with forms to input their responses.
- Asynchronous usage: Polls can be made available for a fixed period of time on a website. Students vote using SMS or log into website - at any time in the polling period
- Synchronous usage: In a lecture theater: Utilizes student personal technologies: (access to mobile telecom services) conventional mobile phones, advanced mobile phones (smart phones) the summarized responses are available on a different set of pages, which can be displayed through the projector and also on each participant's device.

- So, if you reached your limit on incoming votes, all polls are automatically paused until you have either upgraded to increase your vote allowance or until your new billing period starts.

**Customize and share the poll**

A chart is created with polling numbers embedded - ready for polling

- To allow others to vote over the web, copy the current URL (of the created chart) from your web browser's address bar. Then distribute this link to your audience in an email or post it on a web page

**Remote participants**

- can vote on the poll through a website.
- send this web address (URL) to remote participants.
- use the widget or URL to embed live polls into your blog or website. Widgets can be used to allow people to vote from your web site and display the results afterward

**Technique**

**Set up:**

- Create a website login at the SMSPoll website, A poll creator and editor is provided
- publish a poll in any of 3 formats:
Multiple choice polls: define a list of possible answers. Graphs will display the results in real-time.

Free text Poll: the audience can text in anything. Gather feedback or identifying information, like names or ID numbers.

Goal poll: Receive pledges for donations to your non-profit from people via text messages.

Set the duration of the poll:
- The poll can stay open (ready to receive votes) for an unlimited period of time.
- It can either be manually paused or closed, or an auto stop date and time can be set.
- For instance 16 January 2009 | 00:05am.
- However the price plans work on the number of votes received per month.

Before the class:
- Lecture creates the poll at the company website.
- Embed the poll into a PowerPoint presentation if required.
- Once a survey is started, the participants will have a telephone number associated with each choice. Part of the telephone number is coloured red. This red number associated with the SMS method of entering the vote.

At the class:
- Students have the options to vote: if using a conventional mobile phone: send an SMS or phone the selected number. If using a smartphone, PDA, or laptop, open a web browser and select choice.
- You will need an internet connection to view the poll results on a web browser or in the PowerPoint presentation.

After the class:
- Reports can be created if required.

Polling / Voting: Ways to vote

For MCQ’s there are three ways of entering the vote for an active survey:
- Mobile phone – conventional: respondents cast votes by sending text messages to a designated number indicating the option they wish to select.
- Smart phones: respondents can use the web on their mobile device instead of sending a text message to respond to a poll you have created.
- In development: applications for voting with devices such as iPhones, PDAs, Blackberries etc.
- Web voting: respondents go to the website and vote online (if this feature has been activated in the poll design).

(Note: Votapedia has a 4th option: dialing the telephone number provided voters dial a telephone number associated with their choice. They can use a land line or a mobile to vote. Voters will hear two times of dial tones, then a busy line. That means that their vote has been accepted by the system. The voice message to vote using mobile phones is not currently available.

Voting feedback to participants:
- SMSPoll: provide ‘poll creators’ (on a paying subscription plan) based on a feature known as ‘Result Request’. This allows the poll creator to send an SMS with the word ‘RESULT’ and their own password (created in their account settings).
- Following the send of this SMS, they would then instantly receive an SMS back displaying the results of their poll. It would show each vote option in the poll and the number of votes received.

In development:
- It could be created that when a lecturer closes/stops a poll and then ticks a box, an SMS could be sent to all of the participating students containing the results of the poll.
- Please note that RMIT would have to cover the cost of sending the SMS to each student.
- A cheaper option would be to simply post the ‘closed’ poll to a web page within the University website.

Timing for Live polling:
- A vote will be displayed within 2-5 seconds - the delay depends on the voter’s cellular carrier and how long it takes to route an SMS message to a SMS gateway, web servers, and finally on to live polls wherever they are being viewed.
- Any time delay depends on the voter’s cellular carrier and how long it takes to route an SMS message to a SMS gateway, web servers, and finally on to live polls wherever they are being viewed.
- Once counted, the vote is displayed in real time on-screen.
- The poll does not need to be displayed to actively receive votes.
Results – Viewing and sharing
- Embed the poll results widget into your blog or website.
- Download the poll results as a spreadsheet and share that file.
- Poll can receive votes even when you do not have a live internet connection but to display the poll or view results in real time, the presenting computer must have an internet connection.
- When viewing the results, there is a link to download a spreadsheet version. This file can be opened by any spreadsheet application like Microsoft Excel.

Image 3: This image is a screen capture of a poll that is posted on a website. This poll is still live and is available on the web: Try your vote at: http://ars-denise.blogspot.com/

Image 4: This is a static image of a poll results chart. It too is at http://ars-denise.blogspot.com/

Privacy Webpolling
- The poll's question (but not your results) is indexed by search engines unless you disable this setting in your preferences.
- With indexing turned off, polls are private unless you share the secret poll URL (web address) with others, or embed the poll widget in a website.
- When you share the poll's URL, only the poll's owner can see the poll controls, view the detailed results, or correlate answers between polls.

Identifying participants Webpolling
- Use the reports tab, or have voters pre-register as participants.
- Customers on any paid plan can use the Reports tab.
- The Reports tab lets you match up a participant's answers across multiple polls. For example, make a free text poll that asks participants to submit their name, a student ID, a pseudonym, their cell phone number, or any other identifying information. Then ask other multiple choice or free text...
questions as usual. By adding the identifying free text poll and any other polls to a report, you will see how each person answered each question

**Restricting participation – Webpolling**

Each poll lets you select whether people can use text messages, web browsers, or both to participate. You can have your voters pre-register as participants, and restrict your poll to only allow participation from that group. This feature is available on paid education plans, and on the Presenter plan and up.

**Data Capture**

- All data captured is secure on SMSPoll servers under their own own UN&PW.
- They claim to never use, distribute or sell any of the information to third parties, unless commercial terms are in place with a client - at which point the *only data* they could ever have access to would be vote information for *their* polls.
- They claim to have very strict privacy / spam guidelines and rules and for any commercial terms to be created around the passing and ownership of poll information, you would be required to sign and accept our fair use / spam policies for when the data is in your hands.

**Spam**

- SMS spam very similar to email spam. Claim: If RMIT were looking to obtain the mobile numbers of voters, then it could be discuss how you can use this data, the declarations you would have to display to students, unsubscribe features etc etc. These would be provided as part of the terms that would need to be signed

**Deleting a poll**

- The “delete poll” command will delete the poll and the poll results completely from the SMSPoll system. If the poll has been embedded in a powerpoint slide and/or a website : it will also be deleted there as well. Once deleted the poll cannot be retrieve
Costs: For operators SMSPoll: Rate at January 12, 2009
Quotation supplied is available in the Appendix of this report

Customised Plans: are available on request:
These rates are negotiable under the development of the Educational Plans

- Free Plan: Allows 25 votes per poll, 500 votes per month, 2 available chart styles, 0 SMS results requests per month
- Casual Plan: $10.00 per month
  Allows 50 votes per poll, 1000 votes per month, 9 available chart styles, 5 SMS results requests per month
- Professional Plan: $25.00
  Allows 125 votes per poll, 2500 votes per month, 9 available chart styles, 15 SMS results requests per month
- Various other plans up to Elite: $250 per month
  Allows 1500 votes per poll, 25000 votes per month, 9 available chart styles, 100 SMS results requests per month

Additional costs:
- The University can rent (on a yearly basis) your own dedicated number (instead of using the Australian voting number already provided by SMS Poll).

Cost: For Participants
- Poll Everywhere/ SMSPoll does not charge anyone for voting on a poll.
- There is standard cellular text messaging costs involved for participants to send text messages
- The person sending the vote via SMS is responsible for the cost. Currently - it is not possible to SMS to ‘free numbers’ nor have the recipient of the SMS (i.e. SMS Poll, or RMIT) cover the cost
- It is not possible to avoid the students paying for the SMS. Because the SMS comes from their phone, their service provider (Optus, Vodafone etc) will charge them
- Individual wireless carriers may charge standard text message charges, which vary depending on the wireless carrier and any messaging package selected
- For cases where a participant may be voting heavily over a long period of time, it is recommended that participants add an unlimited text messaging plan through the cellular provider.
- Another alternative is for frequent participants who have smartphones to bypass SMS text message charges by using either web voting or our smartphone web voting feature.

Training:
None provided – none needed
- SMSPoll claim they could look at incorporating training into the offering to ensure that all lecturers are fluent in navigating their way around the site and using the product.

Support
- Currently Tier 1 & 2 support is handled via email.
- SMSPoll does not provide telephone support although it may be something they are considering in the future. Due to the nature of SMS Poll's offering being 'Software as a Service' this removes the requirement for the customer to have to install / maintain or upgrade a product. This is usually where most technical issues will occur. Because SMSPoll has complete control over the web based service, the development team monitoring the site activity and service performance. Generally any errors that may occur are captured before they would have any effect.

To date, they claim that
- to have not had one customer support issue where the request has been technical and this is something we strive to maintain.
- 99% of the support cases would be down to not fully understanding how to use the product. In most cases it is someone simply asking how they perform a certain task, or change some information on their poll, access their results etc.
- It can be ideal to have one person who is the 'go to' on product knowledge within the environment where the product is being used. In this scenario, it may be the IT department.
- Technical queries should be emailed to us and whilst these will be looked into immediately we cannot always guarantee that they can be fixed on the spot. It depends on the nature of the issue. In most cases they would simply reply with the answer / solution. In other cases where perhaps more explanation is
required, we would call you back to discuss the issue.


**Terms & Agreement**

These are selected elements of the policy Full policy is available at [http://www.smspoll.net/termsofuse.php](http://www.smspoll.net/termsofuse.php)

**SMSPoll liability**

15.1 Your use of the Services is without any warranty or guarantee.
15.5 We give no warranty and make no representation, express or implied, as to:
15.5.1 the truth of any information given on the Website by any Associate or third party;
15.5.2 any implied warranty or condition as to merchantability or fitness for a particular purpose;
15.9 SMS Poll relies on a third-party SMS gateway for the receiving and sending of SMS messages. And while we will make every attempt to receive and send SMS messages in a timely manner, we shall not be liable for any delays of failed receipt / deliver of messages or any issues, damages, or costs that result from these issues. Further, SMS Poll is not responsible or liable for any costs associated with receiving Results Requests from its members, correctly or incorrectly formatted.

**SMSPoll Content and Intellectual Property Rights**

8.1 Title, ownership rights, and intellectual property rights in the Content whether provided by us or by any other content provider shall remain the sole property of us and / or the other content provider. We will strongly protect its rights in all countries.
8.2 You may not copy, modify, publish, transmit, transfer or sell, reproduce, create derivative works from, distribute, perform, display, or in any way exploit any of the Content, in whole or in part, except as is expressly permitted in this agreement.
8.3 You may post into the Services any Content owned by you. You accept all risk and responsibility for determining whether any Content is in the public domain. You grant to us the right to edit, copy, publish, distribute, translate and otherwise use in any medium and for any purpose any Content that you place on the Service. You represent and warrant that you are authorized to grant all such rights.
8.4 You may download or copy the Content only for your own personal use, provided that you maintain all copyright and other notices contained in such Content. You may not store electronically any significant portion of any Content.
8.5 You represent that any user name or email address selected by you, when used alone or combined with a second or third level domain name, does not interfere with the rights of any third party and has not been selected for any unlawful purpose. You acknowledge and agree that if such selection does interfere with the rights of any third party or is being selected for any unlawful purpose, we may immediately suspend the use of such name or email address, and you will indemnify us for any claim or demand that arises out of your selection. You acknowledge and agree that we shall not be liable to you in the event that we are ordered or required by a court or judicial authority, to desist from using or permitting the use of a particular domain name as part of a name or email address. If as a result of such action, you lose an email address, your sole remedy shall be the receipt of a replacement.

**Content Posted By You on the SMS Poll Site**

9.1 You are solely responsible for any Content and other material that you submit, publish or display on the SMS Poll Site or transmit to other members and/or other website users (hereinafter, "Posted Content").
9.2 You may not post, distribute, or reproduce in any way any copyrighted material, trademarks, or other proprietary information without obtaining the prior written consent of the owner of such proprietary rights.
9.3 You may not submit any Content or material that infringes, misappropriates or violates the intellectual property, publicity, privacy or other rights of any party.
9.4 You may not provide any Posted Content that falsely express or imply that such Content or material is sponsored or endorsed by SMS Poll.
9.5 You may not provide any Posted Content that is unlawful or that promotes or encourages illegal activity.
9.6 You understand and agree that SMS Poll may review and delete any business listings (including business name, address, phone, fax, distance, reviews, rating, reviews) or other Posted Content that in the sole judgment of SMS Poll violates these Terms of Use or which might be offensive, illegal, or that might violate the rights of, harm, or threaten the safety of other users or members of the SMS Poll Site and/or other website users.
9.7 You are solely responsible for your ratings and reviews of businesses listed on SMS Poll. SMS Poll reserves the right, but has no obligation, to monitor disputes between you and any entity which you have reviewed.

9.8 You agree that you will only provide Posted Content that you believe to be true and you will not purposely provide false or misleading information.

9.9 By posting Posted Content on the SMS Poll Site, you agree to and hereby do grant, and you represent and warrant that you have the right to grant, SMS Poll, its contractors, and the users of the SMS Poll Site an irrevocable, perpetual, royalty-free, fully sub-licensable, fully paid up, worldwide license to use, copy, publicly perform, digitally perform, publicly display, and distribute such Posted Content and to prepare derivative works of, or incorporate into other works, such Posted Content. This license is non-exclusive, except you agree that SMS Poll shall have the exclusive right to practice this license to the extent of combining your Posted Content with the Posted Content of other SMS Poll users for purposes of constructing or populating a searchable database of business reviews.

Interruption to the Service

14.1 If it is necessary for us to interrupt the Services then we may do so without telling you first.

14.2 You acknowledge that the Services may also be interrupted for reasons beyond our control.

14.3 You agree that we are not liable to you for any loss whether foreseeable or not, arising as a result of interruption to the Services.

Storage of Data

16.1 We assume no responsibility for the deletion or failure to store, deliver or timely delivery of messages.

16.2 We may, from time to time and without notice, set limit(s) on the number of messages a User may send, through the service, and we retains the right to delete any emails above such limit(s) without any liability whatsoever, and you hereby release us from any such liability. Any notice provided by us to you in connection with such limit(s) shall not create any obligation to provide future notification regarding any change(s) to such limit(s).

Privacy Policy

These are selected elements of the policy Full policy is available at http://www.smspoll.net/privacypolicy.php

This means that we do not distribute, rent or sell any of your personal information. SMS Poll may share non-personal, non-individual information to our partners in aggregate form for research analysis. Like most websites, SMS Poll requires cookies to function properly. You should be aware that SMS Poll cannot control the use of cookies by advertisers or any information advertisers may gather from their use of cookies. If you do not want information collected through the use of cookies, there is a simple procedure in most browsers that allows you to deny or accept the cookie feature; however, you should note that cookies may be necessary to provide you certain features (e.g. voting) available on the SMS Poll site. SMS Poll shall not be responsible or liable for any loss of privacy, disclosure or information, harm, damage or loss that may result from your transmission or any information to us in any connection with this website. Your SMS Poll account is password-protected. SMS Poll tries very hard to protect our users’ information. We use industry standard measures to protect your information that is stored within our database. We limit the access to your information to those employees who need access to perform their job function such as our customer service personnel

Pricing Policy

These are selected elements of the policy Full policy is available at http://www.smspoll.net/pricingpolicy.php

Modifications to the Service and Prices

1. SMS Poll reserves the right at any time and from time to time to modify or discontinue, temporarily or permanently, the Service (or any part thereof) with or without notice.

2. Prices of all Services, including but not limited to monthly subscription plan fees, are subject to change at any time without notice. SMS Poll will endeavour to provide existing clients with at least 3 months notice.

3. SMS Poll shall not be liable to you or to any third party for any modification, price change, suspension or discontinuance of the Service.

Contact details

SMS Poll Pty Ltd
Level 17, 100 Miller Street
North Sydney, NSW 2060
Market Competitor in Australia:

SMS Studio (By CodeSegment): SMS Studio includes a program SMS Voting:
http://www.codesegment.com/sms_voting.htm
Contact details: Marko Popovic: mark@codesegment.com
Quotation is available in the Appendix of this report

This product was used in a trial and reported on in various papers and a book chapter by Dr Matt Jones FBCS CITP CEng (formerly University of Waikato, New Zealand) and Gary Marsden, (University of Cape Town in South Africa)

(See Bibliography)

In preparation of this report I contacted Matt Jones and he is still using the product successfully in his teaching practice. He is currently working at Swansea University, Singleton Park, Swansea, SA2 8PP, Wales UK and can be contacted here: Email mattjonez@gmail.com Website:
http://www.cs.swan.ac.uk/~csmatt/mattjones/mjblog/mjblog.html
Discussion Points: technologies

Voting methods Mobile phone or web voting.

Advantages
- No costly hardware for the university – just the students (mobile phone)!
- No hardware set up, or maintenance
- No running costs for university
- No training required
- Product support available online or by phone 24/7 (depending on plan)
- Surprisingly high percentage of Higher Ed students have text messaging plans that are capped: the price to send this SMS is extremely minimal. On a capped plan potentially the cost is less than 1 cent
- Students have positive confirmation and a record of what they submitted.
- Instructors can use SMS slides in PowerPoint that don’t require installing an add-in
- Minimal time required to creating polls
- Votapedia: open source technologies – free
- Commercial provider supplies all telephony services – security of supply
- University can purchase dedicated phone numbers for their use only - the added benefit is that for long term use you could print this number across your literature and ask that students save this number to their phone - for quicker responses to polling in the lecture theatre. (i.e. It would save them having to constantly type in the phone number)
- Data analysis: could be used for academic accreditation: run a poll, collect the data and then apply the same poll at a later date and evaluate the change in response _ would this be acceptable on a “open” system?

Disadvantages
- Cost of plan with a commercial service provider
- Cost of the SMS falls on the student (but is likely to be very low)
- Response Input data – inconsistencies, errors, typos, text abbreviated language
- How to handle to quantity of the data in free text message: would take considerable time?
- SMS messaging who pays?: solution: the university can purchase dedicated telephone numbers – responses are free for students (as in Votapedia)
- Reliability of service? – internet interruptions during live polling?
- Privacy of information- third party has access to lecturer polls, students responses – potential to sell on to another party?
- Requires cookies to function properly- security?
- It can take as long as two minutes to get a reply from a cell phone, is not a practical substitute for dedicated audience response keypads (they can answer in seconds
- Writing SMS’s is time consuming and error are high
- Spamming – when dedicated numbers are not purchased

Polling telephone numbers: Assignment of telephone numbers to each poll
- Votapedia: No way of linking any two or more surveys together- every new survey randomly gets allocated an assigned telephone number – this can be undesirable: if a lecturer creates 3 surveys in one lecture it would be easier to vote if those 3 surveys used the same
- Better still is all surveys created for one event always used the same set of numbers since attendees could store those numbers in the phone memory: SMSPoll – can assign dedicated phone numbers per lecturer as part of purchase plan (to be confirmed)

Reporting of subsets of results (available in Keepad only)
- A register of participants with email address – so poll results could be sent back out to participants
- Also for analysis of poll results: identify students doing poorly

Product development with commercial vendors (based on a financial incentive)
- Strong – incentives to improve and tailor product in accordance with market demand
Discussion points : KeePad

Advantages
Secure data – stored on desktop computer -polling results not available the web (privacy & security issues)
Students don’t have to register their device online
High level of technical support available
Broad range of poll customization features
ability create a register of participants and to identify each individual student and their response over a period of time
Data analysis : could be used for academic accreditation : run a poll, collect the data and then apply the same poll at a later date and evaluate the change in response _ would this be acceptable on a closed system

Disadvantages
Initial cost of the setup : based on propri ety and specialized hardware and software
Maintenance of the hardware: keypad batteries last 12 months
Availability: managing storage and loan out of equipment
Set up of the hardware: possible solution: preinstall: set up dedicated hard wired teaching spaces
Allocation and retrieval of Keypads in a large lecture theater Solution – students buy or hire their own personal KeePad for the academic year from the university ( Uni Melb does this )
Time to create polls can be lengthy
MCQs are a limited way of asking questions

Discussion Points : Votapedia

Advantages
Free to use – open source software

Disadvantages
Very much a technical work in progress/ development:
Small scale product development occurring due to lack of funding
No business contractual arrangements are available to users
No guarantee of continuity of service: to stay available online and functioning
Lacks a commercial business structure – no ASBN , terms of use
Limited functionality – poll design data charts etc
Yet to be tested with large audiences ( 200 +)
Unable to create poll user ID – very limited data analysis
No reservation of telephone numbers available
Limited supprot – email only – delayed repsonse

Feedback : There is anecdotal feedback that several flaws are identifytiable .
- The phone voting is not as instantenous as SMS.
- It is not as user friendly as SMS (with more instructions to follow and potentially get wrong when voting) and there is also the issue that if a user blocks their number, the vote either doesn't count or gets counted multiple times.
- It also isn't a very scaleable solution (lots of busy signals)
- When voting, it is confusing having different phone numbers to ring, as opposed to SMS, as opposed to response number. These three numbers are easily confused.
Discussion Points: SMSPoll

Advantages
- Company specialises in: SMS voting with the additional benefits of web and mobile web voting.
- Voting is both synchronous and asynchronous: poll can stay open (ready to receive votes) for an unlimited period of time.
- Vendor is open and willing to tailor product to client needs
- Free to try out
- Well tested in USA And UK (Poll Everywhere)
- Telephone Number: Ability to rent (on a yearly basis) own dedicated number (instead of using the Australian voting number already provided by SMS Pol): added benefit here is that for long term use you could print this number across your literature and ask that students save this number to their phone - for quicker responses to polling in the lecture theatre. (i.e. It would save them having to constantly type in the phone number).
- Free voting for (web and mobile web voting) for those students that have either a laptop with internet connection or a web browser on their phone.
- Data captured is secure on SMSPoll servers under their own UN&PW
- Strict privacy / spam guidelines and rules and for any commercial terms to be created around the passing and ownership of poll information, you would be required to sign and accept our fair use / spam policies for when the data is in your hands.
- Evidence of vote received: ‘poll creators’ (available on a paying subscription plan) - feature know as ‘Result Request’. This allows the poll creator to send an SMS with the word ‘RESULT’ and their own password (created in their account settings). Following the send of this SMS, they would then instantly receive an SMS back displaying the results of their poll. It would show each vote option in the poll and the number of votes received.
- They own a dedicated number in Australia that allows users/voters of all polls across SMS Poll to send their votes to. (Some other providers of SMS polling rent shared phone numbers and essentially what this creates is a less effective form of voting where generally more errors occur. Because they own a shared number, they then need to purchase a unique identifier - which is generally a word - such as ‘VOTE’. This then needs to be added to the body of the SMS as well as the voting number. e.g VOTE 1234 (This is technology being phased out in the USA and the UK)
- All voters are tagged with a unique identifier. Assigning names to those identifiers is possible (but tedious to do)

Disadvantages
- Cost involved: student pays to vote. Institution purchases a plan, (plan based on number of votes processed)
- Telephony: 3rd party involved: BT (British Telecom) issues: reliability – cost/price control needs to be embedded into contract
- Not well tested in Australia – no evidence
- Low level of support provided (however this can be negotiated)
- Plans work on the number of votes received per month. So, if you reached your limit on incoming votes, all polls are automatically paused until you have either upgraded to increase your vote allowance or until your new billing period starts. This could be difficult to plan for across the university if a dedicated number was used
Further discussion topics

1. Who Should Pay?
   The "student pays for clickers" paradigm grew from one primary driver: device care and accountability. Harvard’s Graduate School of Education is using clickers this week for professional development workshops. By Monday end of day, 19 out of 100 clickers "walked off" accidentally in the pockets and purses of participants.

2. Purchase plan by audience size or number of polls?
   Most of users setup their polls to allow a person to participate only once. If that's the case, then generally you should purchase a plan with an "audience size" greater than the number of people that will vote. The "audience size" is the maximum number of votes that can be received by any given poll (the number of polls you can create is unlimited).

3. Other technologies available for audience response (for small class teaching) Zing Electronic Meeting system www.aheadofthegame.com.au Note: Trialled and recommended by Graham Timmins at RMIT
   AnyZing 5 software is a specialised meeting system to support organisation-wide knowledge creation, fast implementation of new expert decision or learning processes, cultural change and accelerated innovation. For universities and schools, the tutor or teacher creates a series of workshops with say 6-7 questions per session in their template editor complete with images, website links or documents. All course participants are required to facilitate one session, or participate in all workshops in groups of 5-6 people, where they are pre-assigned to the groups based on their preferred meeting times. Some might join via a college lab, others might prefer to meet from home. Each receives a copy of the software with their course notes.

   Work teams:
   The system can be used for small group on-line meetings for any kind of strategy, continuous improvement, process redesign, planning, problem solving, learning, product or services innovation or team development activity. There are over 50 standard meeting templates and a growing range of specialised titles.

   Team-to-team conferencing:
   The software supports multiple site connections to the Zing keyboard multiplexer which allows consultants or managers to set-up and facilitate workshops, seminars or retreats with a large number of participants at several locations as if they were all co-located.
**Case Studies**

Dr Jurgen Schulte, Department of Physics and Advanced Materials  
University of Technology, Sydney Australia


Brett Williams, Department Community Emergency Health & Paramedic Practice  
Faculty of Medicine, Nursing & Health Science  
Monash University, Melbourne, Australia

Can the use of wireless keypads facilitate interaction amongst health science students in interprofessional education contexts?[Funded by Learning & Teaching Performance Grant, 2006]  

http://amps-tools.mit.edu/tomprofblog/archives/2008/06/884_effective_u.html#more

**Bibliography**

Information Science Publishing, Idea Group


Further Reading


Supporting documentation available

KeePAd Email & telephone communications with Sally Bateman quotations terms of agreement etc
SMSPoll Email & telephone communications with Ian MacCallum quotations terms of agreement etc
Poll Everywhere Email communications with I Sean Iby quotations terms of agreement etc
Votapedia Email & telephone communications with Ken Taylor
Sources consulted and cited

Audience Response Systems: Products

IML audience Response systems  http://www.imlaudienceresponse.com/
KeePad Interactive:  http://www.KEEPAD.com/home.php
PollEverywhere http://www.polleverywhere.com/
SMSPoll http://www.smsspoll.net/
SMSStudio by Code Segment http://www.codesegment.com/products.htm
TurningPoint Technologies  http://www.turningtechnologies.com/

People

Votapedia
Email: Ken.Taylor@csiro.au

SMSPoll
Ian Macallum http://www.ianmccallam.com/sms-poll/ ,
Email: ian@smsspoll.net

SMSStudio – Codesegment
Marko Popovic Email: mark@codesegment.com

Poll Everywhere:
Sean Eby  Email: sean@polleverywhere.com>

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KeePad users at RMIT
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Attachment 2

ETAG Submission
Proposed strategy for the systematic introduction of active lecture technology

Jeremy Keens, Emilio Badoer, Garry Allan, Denise Ellis

Strategic Relevance: From 2009 eTAG Workplan

<table>
<thead>
<tr>
<th>Major initiatives</th>
<th>Actions</th>
<th>Rationale</th>
<th>Link to RMIT Strategic Plan</th>
<th>Time-frame (by when)</th>
<th>Deliverable(s)</th>
<th>Overall Responsibility</th>
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</thead>
<tbody>
<tr>
<td>Standardised classroom technologies</td>
<td>Continuation of AV standardisation project with clear targets</td>
<td>Improved AV infrastructure and service. Inclusion of a trial of Audience Response Systems (also known as ‘clickers’) at the Bundoora Campus.</td>
<td>Priority 7 Action 1&amp;3</td>
<td>August 2009 Dec 2009</td>
<td>Commence trial ARS at Bundoora Approximately 80 spaces upgraded to AV Standard</td>
<td>Rod van den Akker, Garry Allan</td>
</tr>
</tbody>
</table>

Background:

RMIT is at the point of large scale investment in new lecture and teaching spaces. This proposal complements that investment and addresses the 2009 Business Plan objective of improving learning and teaching outcomes. The proposal is an outcome from a 2008 and 2009 LTIF and addresses the use of student feedback technology to provide a more active lecture experience for students. It recommends systematically developing the capability to provide university-wide access to Student Response System technology (SRS). SRS’s are used in synchronous on-campus teaching contexts to gather feedback and track student learning. For students, real-time feedback systems transform a transmissive lecture experience to a far more active and interactive on-campus experience.

SRS technology is at the point of major transformation from dedicated hand-held units to the use of mobile phones or laptops as the student feedback device. This path of technology transformation has a major influence on the strategic decisions associated with expanding SRS technology at RMIT. The core issues are:

1.) The provision of individual portable feedback devices to students on a large scale is cost prohibitive. This approach has been taken at both The University of Queensland and The University of Melbourne (Reference 1), where the fleet size is over 3000 at each university. There is no Australian University providing portable devices to all students. Typically these portable units are loaned to students individually (deposit collected) or handed-out to a class group. The provision of individual units allows for student specific activities such as assessment, to be conducted within a lecture format. The approximate costs to provide individual student units at RMIT would be: $65 per Keepad (the dominant proprietary product), with associated lectern basestations costing: ~$500

The cost dimensions of scaling individual student portable units are:

- 200 students 10 lecture theatres: ~$18,000
- 2000 students 10 lecture theatres: ~$135,000
- 8000 students 49 lecture theatres: ~$544,000 (This would cover major lecture theatres City/Bundoora)

Note: These costs do not include the internal costs associated with loaning the feedback devices. Typically universities loan them from the library with an $80 deposit.

2.) An alternative approach is to provide dedicated feedback devices fixed to each lecture seat. This is a lower cost option, with the approximate cost dimensions as follows:

Bundoora:

- 11 Lecture Theatres 1400 Seats: KeePad Costs: $97,000 + Installation (~$100,000) Total ~ $200,000

City Campus:

- 38 Lecture Theatres 4450 Seats: KeePad Costs: $308,000 + Installation (~$380,000) Total ~ $688,000

Note: Fixed units necessitate that all polling is anonymous.

3.) Mobile phone or laptop based SRS feedback technology is reliant on students having smart phones or laptops with WiFi capability. The most recent informal surveys indicate that a significant percentage of...
Australian University students are now equipped with smartphone technology. However, at this point in time, students are not necessarily prepared to use their personal phones for feedback in University lectures. Additionally, the technology expectation associated with the use of student mobile phones or laptops for in-class student raises significant equity issues.

4.) Different groups within the University are purchasing SRS technology to meet local requirements. There is an installed base of over 610 KeePads within RMIT. Currently there is no standard support processes for this technology. Table 1 lists the identified community of practice with this technology, with 30 academic and general staff teaching into 7 schools across all three academic colleges. Further users are likely to exist, and the technology is positioned for inclusion in works for the School of Applied Communications (currently seeking quotations for KeePad units) as well as the new 350 seat lecture theatre on the Bundoora Campus.

The following timeline illustrates the projected technology changes and options for RMIT to advance capability with the introduction of enterprise SRS

<table>
<thead>
<tr>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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</thead>
<tbody>
<tr>
<td>RMIT WiFi network complete?</td>
<td>KeePad responseware available</td>
<td>Estimated Student ownership of mobile phones: 80%</td>
<td>KeePad software available on most smartphones</td>
</tr>
<tr>
<td>Large Lect Theatre Bundoora</td>
<td>Estimated Student ownership of smart phones: 100%</td>
<td>App. Comm usage</td>
<td></td>
</tr>
</tbody>
</table>

The initial investigation in the 2009 LTIF compared the SRS systems: SMSPoll (mobile phone base), Votapedia (mobile phone based) and KeePad (‘clicker’ and mobile phone based) (Reference 2). The investigation determined that the KeePad Product suite is the technology best suited to scaling to University-wide use at RMIT. The principal factors in the determination being: functionality specific to University sector, Blackboard integration and ongoing service support. Detail on the comparison of KeePad, VotApedia, SMSpoll and Poll Everywhere are provided in Reference 2.

**Product overview - KeePad**

TurningPoint™, provided by Keepad Interactive is used in the majority of universities in Australia. The product allows interactivity and engagement by audiences via two means:

1.) A ‘clicker’-type input device (KeePad) Cost ~ $65
2.) A WiFi enabled device that has access to a web browser, this could be via a mobile phone, laptop or other device. The KeePad software used is termed Responseware. The WiFi device is connected to the RMIT wireless network so that the student interacts with the external KeePad server without cost to the student. The Internet charges for the data traffic must be met by RMIT. If the student so choses, they could use their own mobile Internet access for the transmission. Importantly, the student can participate from another campus, so feedback can be in the Videoconference delivered sessions running concurrently at Bundoora, Sale and Hamilton. Responseware is available in the US, but yet to be released in Australia.

Additionally, a portable radio frequency receiver is attached to the lectern computer or lecturer’s laptop to receive the radio frequency signal from the KeePad unit. Stand alone desktop software is installed on the computer being used to deliver the presentation. Multiple choice questions are presented using Powerpoint, or other Office applications and “live” polling collates and displays voter responses. Both KeePad devices and mobile phones can be used in the same class group. Post class, reports can be created from the data gathered.

**KeePad integration with Blackboard:** The KeePad TurningPoint program provides students with a registration process within the Blackboard framework. It allows academics to download class enrolment data from Blackboard and load participant lists to track student learning during interactive sessions. Additionally, academics can upload session data and assessment grades into the Blackboard Gradebook. Instructors can communicate interactive session results to students via emailed reports.

As the broad availability of wireless internet connectivity expands across the university and the student uptake of multi-purpose, internet-ready personal devices (including mobile phones, calculators, iPods, PDA’s, laptops and netbooks) increases, it expands the possibility of allowing students to respond to questions using a WiFi or data connection, this is the Responseware component of the suite.

Currently, for mobile phone use, Responseware will run in a Web Browser on Web enabled phones. Therefore for students to participate in a feedback session, they will need to: connect to the RMIT WiFi network, run the web browser, go to the Responseware website and enter a session number. There is a more functionally rich
application available for iPhones, Blackberrys and Windows Mobile devices. Students would need to download the relevant Responseware application to their phone in order to access this improved functionality.

On the basis of informal surveys from Australian Universities, it is estimated that the current uptake of WiFi enabled personal devices amongst the student cohort is approximately 70%. Importantly however, even though mobile phones can be used to provide lecture feedback at no cost to the student, anecdotally students are reluctant to use their personal devices for lecture participation at this point in time. It should be noted that the Responseware product is not yet available in Australia, though it was released to the US market in the final quarter 2008.

As University capability with mobile phone or laptop based lecture feedback builds, there is still a need to provide a dedicated SRS, but it is envisioned that as participation by students using the Internet on their personal devices increases, no further purchase of dedicated input devices would be required.

Implications for Learning and Teaching
Depending on their course goals and learning objectives, academics use SRSs for various teaching purposes. SRSs provide a quick assessment of students’ prior knowledge, identification of misconceptions before introducing a new subject, a check of students’ understanding of new material, and they enable instruction and other active learning strategies, feedback on teaching, recording of class attendance and participation. SRS questions can lead to unexpected responses from students, teachers may need to supplement explanations, add examples, adjust the pace or alter the lecture sequence in order to ensure that students understand the material. Reports can identify students who need support and session feedback provides an evaluation of teaching practice. Using SRSs implies not only changes in the way staff teach, but also new expectations for both staff and students. Importantly, with the provision of specific devices to students, and this can include the use of their mobile phones, it is possible to track individual student performance, and in fact set exams in a lecture venue.

Implications for Teaching Spaces
SRSs change the utility of teaching spaces. They transform large lecture theatres from instructor-centred teaching environments into interactive learning spaces.

The roadmap for systematically increasing the University’s capability with SRS Technology
This roadmap is based on introducing SRS technology that is ultimately scalable to all of RMIT’s teaching spaces that are equipped with WiFi access. It is built out of the 2009 LTIF managed by Jeremy Keens and Emilio Badoer.

1.) Provision of access to RMIT’s WiFi network for student mobile phones and other portable devices
At the present time RMIT’s WiFi network readily accommodates Blackberry and iPhones. Other WiFi enabled smart phones can also use the network. The extent of this service capability needs to be ratified by ITS, and support documentation for users produced. In addition to this, broad support for student netbooks needs to be confirmed and supported with documentation on the ITS Wireless Website. Additionally, clarification is sought on when network coverage of the Bundoora teaching spaces will be achieved. This issue impacts strongly on the 2009 LTIF and it is recommended that if this WiFi deployment is not available in semester 2, then this initiative be held over to 2010 and supported from the 2010 eTAG budget (if this budget item continues).

Detail on the status of RMIT’s WiFi network for mobile phone use:
- RMIT WiFi supports notebooks, laptops and tablets & compact netbooks
- For mobile phone use RMIT WiFi supports phones that accommodate the protocols: 802.1x and EAP-TTLS. 802.1x is the general wireless access protocol, TTLS is the security and authentication protocol,
- Support for 802.1x and TTLS.
It is known that iphones, iPod touches, WiFi enabled Blackberrys meet these protocols. There is a massive rate of change in the ability for mobile phones to meet this protocols, there can be slight differences in phones that mean network connectivity is not valid for an earlier (almost) identical version of the phone. The configuration steps can vary between seemingly identical phones.
- Basestation load:
A wireless basestation will support approx 30 users (depending greatly on their bandwidth demands). For a low bandwith application like Responseware you might get (say) 100 users, but the response will be slow. Multiple basestations per teaching space are required to facilitate the numbers of students we project for large lecture theatres.
Further clarity on the technology issues outlined above is required, along with more detailed knowledge of student smartphone usage.

2.) Trialling the KeePad Responseware service:
Based on licensing models, Turning Technologies provide the hosting and web services necessary for web-enabled interactive polling session, which eliminates the need for the university to host, maintain, and support the application and allows for immediate utilization of the response technology. At this point in time the server is located in the US.

It is envisioned that from 2010 onward, coverage of Wifi will have been expanded to cover all major teaching spaces at RMIT, so that this service can be used without cost by students.

In Semester 2 2009 a trial of Responseware to be undertaken on the Bundoora Campus by Jeremy Keens and Emilio Badoer, in conjunction with AV Services, using a trial licence provided by KeePad. When the Responseware system is available to the Australian market, a quotation will be obtained for a small number of concurrent Responseware licences. It is projected that the concurrent licence cost will be in the range of $20 - $27 for a user for a year, and approximately $25,000 pa for 1000 concurrent users.

3.) Understanding student perspectives on in-class use of personal mobile phones
In Semester 2 2009 Emilio Badoer and Jeremy Keens will survey students to elicit their attitudes to using personal mobile phones for in-class online participation. Specific questions will address the student ownership of Smart Phones with WiFi and Web Browsing functionality. Further questions will address the use of iPhone, Blackberry, Windows Mobile and laptops in the classroom. The survey will run in Weeks 6 and 7 within courses delivered by the School of Medical Sciences, addressing broad student demographics. The survey will also be available to other members of the SRS user community.

4.) Building staff capability with SRS
A community of practice of SRS has been brought together by Jeremy Keens, and in semester 2 this group will be extended to include participants from across the University. Table 1 lists the invited membership of this group, which includes all KeePad users at RMIT. Best practice use of SRS identified from Jeremy’s and other members’ earlier work, will be shared with the community of practice, along with the changing state of the technology at RMIT. It is recommended that the ITS Training team and appropriate College academic development staff also interface with the developing SRS community, to assist in the in-house training requirements associated with the product suite.

To provide a more coordinated use of SRS technology within RMIT, a support website is to be produced. This website will be designed to provide advice and support on using SRS systems to create active on-campus learning experiences. The site will provide links to mentor staff, and the process to be followed to access supported SRS technology.

It is expected that a staff development program will developed in conjunction with ITS Training, built on the expertise within the SRS Community of Practice.
The form of the staff development program in Semester 2 will be:
- General information for the SRS Community of Practice and a presentation at the L&T Expo.
- Training by KeePad personnel
Bundoora Users with KeePad staff (am)  Train the trainer (ITS/ADG) with KeePad staff (pm)
- Other training as determined from the general information session.

5.) Further acquisition of dedicated and portable KeePad devices
In order to advance University expertise with SRS systems it is proposed that additional mobile KeePad systems be acquired. These would allow for increased uptake of SRS technology in the period before the use of personal mobile phones increases. As part of extending the outcomes of the 2009 LTIF it is proposed that the following KeePad systems be acquired at the Bundoora Campus.

   i) 75 keepads and 5 receivers (to be able to run multiple tutorial groups simultaneously
   Cost:  $4650 (KeePads) + $1625 (receivers) = $6275
   Managed by AV Services or the Medical Sciences School office

   ii) 2 x ITouch devices for JK and EB to utilise to show Responseware capability to students and staff
   Cost: $329 x 2

6.) Resolution of on-campus support capability for SRS technology.
At this point in time a number of groups within the University are interacting with KeePad and acquiring technology independent of aggregated licence schemes. It is recommended that the AV Services Manager be responsible for technical oversight of SRS deployment at RMIT.
7.) Expanded use in the Library
The university librarian has commenced the implementation of Keepad into the teaching practice of Liaison Librarians. The technology is being used to introduce students to the services and resources of the library, to teach concepts of information retrieval and management, academic integrity and for assessment of information literacy skills. Library skills sessions are now interactive and engaging for students of all levels who learning to use the valuable subscription resources provided to support their research and learning.

References:

1.) KeePad kit availability at the University of Melbourne is described at: www.infodiv.unimelb.edu.au/tss/access/interactive.html

2.) Report on Audience Response Systems: KeePad, Votapedia and SMSPoll, Internal report, Author: Denise Ellis, Report available via email contact at: denise.ellis@rmit.edu.au

Table 1 : RMIT SRS Community of Practice

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
<td>Emilio Badoer</td>
<td>SET</td>
<td>Medical Sciences</td>
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<tr>
<td>John Benwell</td>
<td>DSC</td>
<td>College of DSC Office</td>
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<td>Peter Bertok</td>
<td>SET</td>
<td>Computer Science &amp; Info Tech</td>
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<td>Wendy Brakey</td>
<td>SET</td>
<td>Life &amp; Physical Sciences</td>
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<td>Bruce Byrne</td>
<td>SET</td>
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<td>Michael McCann</td>
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<tr>
<td>Maazuza Othman</td>
<td>SET</td>
<td>Program Coordinator, Environmental Engineering</td>
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<tr>
<td>Konrad Peszynski</td>
<td>BUS</td>
<td>BIT Coordinator Master of Business IT</td>
</tr>
<tr>
<td>Terrence Piva</td>
<td>SET</td>
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<td>Simon Potocnik</td>
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</tr>
<tr>
<td>Raju Mulye</td>
<td>BUS</td>
<td>Eco, Fin &amp; Marketing</td>
</tr>
<tr>
<td>Peter Rich</td>
<td>SET</td>
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<tr>
<td>Tony Robins</td>
<td>SET</td>
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<td>Graham Timmins</td>
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<td>Life &amp; Physical Sciences</td>
</tr>
<tr>
<td>Graham White</td>
<td>SET</td>
<td>Aerosp Mech &amp; Manuf Eng</td>
</tr>
</tbody>
</table>

RMIT staff – identified potential KeePad users (waiting for training)

<table>
<thead>
<tr>
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<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linda Buxton</td>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Irene Caleb</td>
<td>Library</td>
<td></td>
</tr>
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<td>Cathy Costa</td>
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<tr>
<td>Patricia Darwish</td>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Yasmin Dinned</td>
<td>Library</td>
<td></td>
</tr>
</tbody>
</table>
Catherine Foot Library
Wendy Freiches Library
Belinda Johnson DSC GSSP
Pauline King Library
Gary Pearce Library
Madeleine Shanahan SET Medical Sciences
Annette Sullivan Library
Mark Vines DSC PCPM
John Whyte DSC GSSP
Andrea Chester HS

Staff interested in extending the use of student mobile phones, and other portable devices to improve the capacity for class-feedback:

<table>
<thead>
<tr>
<th>Name</th>
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<th>School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsha Berry</td>
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<td>Joan Richardson</td>
<td>BUS</td>
<td>BIT</td>
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<tr>
<td>Margaret Hamilton</td>
<td>SET</td>
<td>CS&amp;IT</td>
</tr>
</tbody>
</table>

Additional interest groups:
School of Applied Communication: Space refurbishment to include SRS technology
ITS Training Team: SRS good practice and ongoing skills development with SRS technology
Attachment 3

Mobile phone usage survey
Attitudes Towards Mobile Phones as a Method for Personalised Response Systems: A Student Survey

Statistical Report

James Baglin
12/12/2009
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Report Overview

The following report contains the full descriptive results of the “Survey of student use of mobile phones”. This surveyed gathered data on student’s attitudes towards the use of mobile phones (and other devices) as a method of expanding the use of Personal Response Systems (PRS). The survey was conducted in class using the keepads PRS to gather student responses.

The report will be broken up into three main sections. The first section will describe the sample which responded to the survey. The second section will give a detailed question-by-question analysis of student responses. The final section will consider the effect of key demographics on attitudes towards the use of mobile phones (and other devices) as an alternative PRS method.

Section 1 – Sample Characteristics

Table 1 contains a comprehensive break down of sample characteristics. The frequency column gives the raw count of respondents who indicated in that category (e.g. 65 respondents indicated that they were male). The percent column gives the percentage of total respondent who belonged to that respective category (e.g. 26.86% of the total sample indicated that they were male, 58.68% that they were female and 14.46% did not give a response). The valid percent column gives the percentage of valid responses (total responses minus missing responses) in that respective category (e.g. 31.4% of valid responses to the gender question were male).

The total sample consisted of 242 respondents. According to the sample characteristics, most respondents were female (68.6%), under the age of 20 (56.93%), studying nursing (25.79%) and completing their first year of study (75.96%). Missing value rates for each characteristic (gender, age category, program and year level) ranged from 8.68% to 16.53%.
## Table 1
Sample Characteristics of Respondents to the Survey of Student Use of Mobile Phones

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>65</td>
<td>26.86</td>
<td>31.40</td>
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<tr>
<td></td>
<td>Female</td>
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<td>58.68</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>207</td>
<td>85.54</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>35</td>
<td>14.46</td>
<td></td>
</tr>
<tr>
<td>Age Category</td>
<td>Under 20</td>
<td>115</td>
<td>47.52</td>
<td>56.93</td>
</tr>
<tr>
<td></td>
<td>Between 21 and 30</td>
<td>58</td>
<td>23.97</td>
<td>28.71</td>
</tr>
<tr>
<td></td>
<td>31 or over</td>
<td>29</td>
<td>11.98</td>
<td>14.36</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>202</td>
<td>83.47</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>40</td>
<td>16.53</td>
<td></td>
</tr>
<tr>
<td>Program</td>
<td>Pharmaceutical Sciences</td>
<td>20</td>
<td>8.26</td>
<td>9.05</td>
</tr>
<tr>
<td></td>
<td>Laboratory Medicine</td>
<td>16</td>
<td>6.61</td>
<td>7.24</td>
</tr>
<tr>
<td></td>
<td>Human Movement</td>
<td>10</td>
<td>4.13</td>
<td>4.52</td>
</tr>
<tr>
<td></td>
<td>Physical Education</td>
<td>1</td>
<td>0.41</td>
<td>0.45</td>
</tr>
<tr>
<td></td>
<td>Biomedical Sciences</td>
<td>44</td>
<td>18.18</td>
<td>19.91</td>
</tr>
<tr>
<td></td>
<td>Chiropractic</td>
<td>41</td>
<td>16.94</td>
<td>18.55</td>
</tr>
<tr>
<td></td>
<td>Osteopathy</td>
<td>20</td>
<td>8.26</td>
<td>9.05</td>
</tr>
<tr>
<td></td>
<td>Chinese Medicine</td>
<td>9</td>
<td>3.72</td>
<td>4.07</td>
</tr>
<tr>
<td></td>
<td>Medical Radiations</td>
<td>3</td>
<td>1.24</td>
<td>1.36</td>
</tr>
<tr>
<td></td>
<td>Nursing</td>
<td>57</td>
<td>23.55</td>
<td>25.79</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>221</td>
<td>91.32</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>21</td>
<td>8.68</td>
<td></td>
</tr>
<tr>
<td>Year Level</td>
<td>Year 1</td>
<td>158</td>
<td>65.29</td>
<td>75.96</td>
</tr>
<tr>
<td></td>
<td>Year 2</td>
<td>34</td>
<td>14.05</td>
<td>16.35</td>
</tr>
<tr>
<td></td>
<td>Year 3</td>
<td>16</td>
<td>6.61</td>
<td>7.69</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>208</td>
<td>85.95</td>
<td>100.00</td>
</tr>
<tr>
<td></td>
<td>Missing</td>
<td>34</td>
<td>14.05</td>
<td></td>
</tr>
</tbody>
</table>
Section 2 - Question Response Analysis

The survey asked respondents a total of 11 questions relating to the use of mobile phones as a method of PRS. Question types included forced categories, yes/no, multiple response and likert scales. Table 2 contains a list of each question asked along with the possible responses given to respondents. The following subsections contain a comprehensive break down of responses to each of the questions in Table 2.

Table 2
Questions Asked in the Survey of Student Use of Mobile Phones

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>Possible Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What sort of internet access does your phone have?</td>
<td>Through the G2/G3 network, through the network and wireless (WiFi), It doesn't have internet access, I don't know, I don't have a phone</td>
</tr>
<tr>
<td>2.</td>
<td>Do you currently use your phone to access the internet outside of University?</td>
<td>More than once a day, Once a day, Once a week, Never</td>
</tr>
<tr>
<td>3.</td>
<td>Do you currently use your phone to access the internet at University?</td>
<td>More than once a day, Once a day, Once a week, Never</td>
</tr>
<tr>
<td>4.</td>
<td>If you access the internet with your phone, do you access it for any of these reasons (at uni or elsewhere)? Select as many as you need.</td>
<td>Social networks (Facebook, Twitter, My Space etc), Software, Music or video (e.g. Youtube), News, General browsing, Email (any system including RMIT), Maps and directions, University related (Blackboard, Lectopia, research), Other</td>
</tr>
<tr>
<td>5.</td>
<td>If you have accessed the internet from within RMIT have you used the RMIT WiFi or your providers G2/G3 network?</td>
<td>RMIT WiFi, Private service provider, Don't access the internet at all while at university</td>
</tr>
<tr>
<td>6.</td>
<td>To access RMIT WiFi – your mobile phone needs particular specifications Can your mobile phone be configured to use RMIT WiFi?</td>
<td>Yes, Yes I tried but couldn't make it work, Don't know -have never tried to, No</td>
</tr>
<tr>
<td>7.</td>
<td>If your phone could access RMIT WiFi, would you use your phone to access the internet for free while at uni?</td>
<td>Yes, No, Don't know</td>
</tr>
<tr>
<td>8.</td>
<td>When selecting your next mobile phone would you factor into your decision the functional requirements needed to connect to RMIT WiFi?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>9.</td>
<td>Many devices can access the RMIT WiFi. Do you bring any of the following to university?</td>
<td>Laptop, Netbook, iPod Touch, Other WiFi enabled device</td>
</tr>
<tr>
<td>10.</td>
<td>Would you be willing to use your phone, iPod, laptop, netbook or other device in a lecture or tute to interact with the lecturer during a lecture (using the WiFi at no cost)?</td>
<td>Strongly agree, agree, neutral, disagree, strongly disagree</td>
</tr>
<tr>
<td>11.</td>
<td>When selecting your next mobile phone would you factor into your decision the ability to participate in feedback mechanisms?</td>
<td>Yes, No</td>
</tr>
</tbody>
</table>
**Question 1**

**What sort of internet access does your phone have?**

Table 3 contains the frequencies and percentages of responses to Question 1 (also see Figure 1). The modal response was “Through the G2/G3 network” which accounted for 25% of the sample’s responses (taking into account missing responses) and 27.27% of valid responses (not counting missing responses). A near equal proportion of students also stated that they did not have access to the internet through their phone (23% of the sample and 25% of valid responses).

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through the G2/G3 network</td>
<td>60</td>
<td>25</td>
<td>27.27</td>
</tr>
<tr>
<td>Through the network and wireless (WiFi)</td>
<td>46</td>
<td>19</td>
<td>20.91</td>
</tr>
<tr>
<td>It doesn’t have internet access</td>
<td>55</td>
<td>23</td>
<td>25.00</td>
</tr>
<tr>
<td>I don’t know</td>
<td>42</td>
<td>17</td>
<td>19.09</td>
</tr>
<tr>
<td>I don’t have a phone</td>
<td>17</td>
<td>7</td>
<td>7.73</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>220</td>
<td>91</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>22</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1:** Percentage Responses to Question 1
**Question 2**

*Do you currently use your phone to access the internet outside of University?*

Table 4 contains the frequencies and percentages of responses to Question 2. The modal response was “Never” which accounted for 59.92% of the sample’s responses (taking into account missing responses) and 65.02% of valid responses (not counting missing responses). This indicates that under half (34.98%) of the respondents used their mobile phones to access the internet outside of university (see Figure 2).

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a day</td>
<td>34</td>
<td>14.05</td>
<td>15.25</td>
</tr>
<tr>
<td>Once a day</td>
<td>21</td>
<td>8.68</td>
<td>9.42</td>
</tr>
<tr>
<td>Once a week</td>
<td>23</td>
<td>9.50</td>
<td>10.31</td>
</tr>
<tr>
<td>Never</td>
<td>145</td>
<td>59.92</td>
<td>65.02</td>
</tr>
<tr>
<td>Total</td>
<td>223</td>
<td>92.15</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>19</td>
<td>7.85</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 2: Percentage Responses to Question 2**
Question 3

Do you currently use your phone to access the internet at University?

Table 5 contains the frequencies and percentages of responses to Question 3. The modal response was “Never” which accounted for 62.81% of the sample’s responses (taking into account missing responses) and 71.36% of valid responses (not counting missing responses). Once again, well under half (28.64%) of the respondents reported using their mobile phones for internet access at university (see Figure 3).

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a day</td>
<td>32</td>
<td>13.22</td>
<td>15.02</td>
</tr>
<tr>
<td>Once a day</td>
<td>14</td>
<td>5.79</td>
<td>6.57</td>
</tr>
<tr>
<td>Once a week</td>
<td>15</td>
<td>6.20</td>
<td>7.04</td>
</tr>
<tr>
<td>Never</td>
<td>152</td>
<td>62.81</td>
<td>71.36</td>
</tr>
<tr>
<td>Total</td>
<td>213</td>
<td>88.02</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>29</td>
<td>11.98</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: Percentage Responses to Question 3

Question 4

If you access the internet with your phone, do you access it for any of these reasons (at uni or elsewhere)? Select as many as you need.

Table 6 contains the frequencies and percentages of responses to Question 4. Question 4 was a multiple response item meaning that respondents could answer with more than one option. The Percent column gives the percentage of total responses accounted for by a given category whereas the Percent of Cases column give the percentage of responses who responded in that category. The modal response was “Social networks” which accounted for 23.30% of responses given. A total of 57.24% of respondents selected Social networks as a reason. Only 18.62% of respondents indicated that they used mobile internet access for university related reasons (see Figure 4).
Table 6
Multiple Response Table of Responses to Question 4*

<table>
<thead>
<tr>
<th>Responses</th>
<th>N</th>
<th>Percent</th>
<th>Percent of Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social networks</td>
<td>83</td>
<td>23.30</td>
<td>57.24</td>
</tr>
<tr>
<td>Software</td>
<td>22</td>
<td>6.18</td>
<td>15.17</td>
</tr>
<tr>
<td>Music or video</td>
<td>39</td>
<td>10.96</td>
<td>26.90</td>
</tr>
<tr>
<td>News</td>
<td>33</td>
<td>9.27</td>
<td>22.76</td>
</tr>
<tr>
<td>General browsing</td>
<td>38</td>
<td>10.67</td>
<td>26.21</td>
</tr>
<tr>
<td>Email</td>
<td>45</td>
<td>12.64</td>
<td>31.03</td>
</tr>
<tr>
<td>Maps and directions</td>
<td>35</td>
<td>9.83</td>
<td>24.14</td>
</tr>
<tr>
<td>University related</td>
<td>27</td>
<td>7.58</td>
<td>18.62</td>
</tr>
<tr>
<td>Other</td>
<td>34</td>
<td>9.55</td>
<td>23.45</td>
</tr>
<tr>
<td>Total**</td>
<td>356</td>
<td>100.00</td>
<td>245.52</td>
</tr>
</tbody>
</table>

*Multiple response allows a respondent to give multiple answers
**Only 145 (59.9%) of the sample responded to question 4 (97 or 40.1% missing)

Figure 4: Percentage Responses to Question 4
Question 5

If you have accessed the internet from within RMIT have you used the RMIT WiFi or your providers G2/G3 network?

Table 7 contains the frequencies and percentages of responses to Question 5. The modal response was “Don’t access the internet at all while at university” which accounted for 33.88% of the sample’s responses (taking into account missing responses) and 44.32% of valid responses (not counting missing responses). Only a quarter (25.41%) of respondents indicated that they connect through the RMIT WiFi (see Figure 5).

Table 7

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>RMIT WiFi</td>
<td>47</td>
<td>19.42</td>
<td>25.41</td>
</tr>
<tr>
<td>Private service provider</td>
<td>56</td>
<td>23.14</td>
<td>30.27</td>
</tr>
<tr>
<td>Don’t access the internet at all while at university</td>
<td>82</td>
<td>33.88</td>
<td>44.32</td>
</tr>
<tr>
<td>Total</td>
<td>185</td>
<td>76.45</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>57</td>
<td>23.55</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5: Percentage Responses to Question 5
**Question 6**

To access RMIT WiFi – your mobile phone needs particular specifications Can your mobile phone be configured to use RMIT WiFi?

Table 8 contains the frequencies and percentages of responses to Question 6. The modal response was “Don’t know - have never tried to” which accounted for 39.26% of the sample’s responses (taking into account missing responses) and 47.03% of valid responses (not counting missing responses). Only a fifth of the respondents (21.29%) had attempted to connect to the RMIT WiFi with only 8.42% of respondents being successful (see Figure 6).

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>17</td>
<td>7.02</td>
<td>8.42</td>
</tr>
<tr>
<td>Yes, I tried but couldn't make it work</td>
<td>26</td>
<td>10.74</td>
<td>12.87</td>
</tr>
<tr>
<td>Don't know - have never tried to</td>
<td>95</td>
<td>39.26</td>
<td>47.03</td>
</tr>
<tr>
<td>No</td>
<td>64</td>
<td>26.45</td>
<td>31.68</td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>83.47</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>40</td>
<td>16.53</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6: Percentage Responses to Question 6
Question 7

If your phone could access RMIT WiFi, would you use your phone to access the internet for free while at uni?

Table 9 contains the frequencies and percentages of responses to Question 7. The modal response was “Yes” which accounted for 67.36% of the sample’s responses (taking into account missing responses) and 77.62% of valid responses (not counting missing responses). Only a small minority of respondents (10.48%) stated that they would not use their mobile phones to connect to the RMIT WiFi for free internet access (see Figure 7).

Table 9

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>163</td>
<td>67.36%</td>
<td>77.62%</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>9.09%</td>
<td>10.48%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>25</td>
<td>10.33%</td>
<td>11.90%</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>86.78%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Missing</td>
<td>32</td>
<td>13.22%</td>
<td></td>
</tr>
</tbody>
</table>

Figure 7:

Percentage Responses to Question 7
**Question 8**

When selecting your next mobile phone would you factor into your decision the functional requirements needed to connect to RMIT WiFi?

Table 10 contains the frequencies and percentages of responses to Question 8. The modal response was “Yes” which accounted for 48.76% of the sample’s responses (taking into account missing responses) and 59.30% of valid responses (not counting missing responses). There were 33.47% (40.70% of valid responses) who stated the opposite (see Figure 8). There appears to be a relatively high proportion of students who are not willing to take connectivity to the RMIT WiFi into consideration when selecting their next mobile phone.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>118</td>
<td>48.76</td>
<td>59.30</td>
</tr>
<tr>
<td>No</td>
<td>81</td>
<td>33.47</td>
<td>40.70</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>82.23</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>43</td>
<td>17.77</td>
<td></td>
</tr>
</tbody>
</table>

*Figure 8: Percentage Responses to Question 8*
**Question 9**

Many devices can access the RMIT WiFi. Do you bring any of the following to university?

Table 11 contains the frequencies and percentages of responses to Question 9. The modal response was “Laptop” which accounted for 38.43% of the sample’s responses (taking into account missing responses) and 60.78% of valid responses (not counting missing responses). The laptop was by far the most common device taken to university by respondents (see Figure 9).

Table 11

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop</td>
<td>93</td>
<td>38.43</td>
<td>60.78</td>
</tr>
<tr>
<td>Netbook</td>
<td>6</td>
<td>2.48</td>
<td>3.92</td>
</tr>
<tr>
<td>iPod Touch</td>
<td>26</td>
<td>10.74</td>
<td>16.99</td>
</tr>
<tr>
<td>Other WiFi enabled device</td>
<td>28</td>
<td>11.57</td>
<td>18.30</td>
</tr>
<tr>
<td>Total</td>
<td>153</td>
<td>63.22</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>89</td>
<td>36.78</td>
<td></td>
</tr>
</tbody>
</table>

Figure 9: Percentage Responses to Question 9
**Question 10**

Would you be willing to use your phone, iPod, laptop, netbook or other device in a lecture or tute to interact with the lecturer during a lecture (using the WiFi at no cost)?

Table 12 contains the frequencies and percentages of responses to Question 10. The modal response was “Strongly agree” which accounted for 33.88% of the sample’s responses (taking into account missing responses) and 39.23% of valid responses (not counting missing responses). Overall, respondents seemed to agree with the use of alternative methods of PRS in lectures and tutes (see Figure 10).

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>82</td>
<td>33.88%</td>
<td>39.23%</td>
</tr>
<tr>
<td>Agree</td>
<td>58</td>
<td>23.97%</td>
<td>27.75%</td>
</tr>
<tr>
<td>Neutral</td>
<td>23</td>
<td>9.50%</td>
<td>11.00%</td>
</tr>
<tr>
<td>Disagree</td>
<td>21</td>
<td>8.68%</td>
<td>10.05%</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>25</td>
<td>10.33%</td>
<td>11.96%</td>
</tr>
<tr>
<td>Total</td>
<td>209</td>
<td>86.36%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Missing</td>
<td>33</td>
<td>13.64%</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 10:** Percentage Responses to Question 10
**Question 11**

When selecting your next mobile phone would you factor into your decision the ability to participate in feedback mechanisms?

Table 13 contains the frequencies and percentages of responses to Question 11. The modal response was “Yes” which accounted for 42.56% of the sample’s responses (taking into account missing responses) and 52.02% of valid responses (not counting missing responses). 39.26% (47.98% of valid responses) of respondents stated the opposite (see Figure 11). In agreement with Question 8 there appears to be a relatively high proportion of students unwilling to take into account PRS connectivity when purchasing their next mobile phone.

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>103</td>
<td>42.56</td>
<td>52.02</td>
</tr>
<tr>
<td>No</td>
<td>95</td>
<td>39.26</td>
<td>47.98</td>
</tr>
<tr>
<td>Total</td>
<td>198</td>
<td>81.82</td>
<td>100.00</td>
</tr>
<tr>
<td>Missing</td>
<td>44</td>
<td>18.18</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 11:** Percentage Responses to Question 11
Section 3 - Predicting the Uptake of Alternative Methods of PRS

Demographic information (gender, age category and year level) was used to predict the uptake (Questions 10 and 11) of other methods of PRS. Question 10 asked “Would you be willing to use your phone, iPod, laptop, netbook or other device in a lecture or tute to interact with the lecturer during a lecture (using the WiFi at no cost)? Question 11 asked “When selecting your next mobile phone would you factor into your decision the ability to participate in feedback mechanisms?” Question 10 was measured on a 5-point likert scale and question 11 was measured on a dichotomous yes/no scale.

Multiple logistic regression was used to predict the two uptake variables (Question 10 and 11) using gender, age category and year level. Logistic regression uses ordinal or continuous variables to predict dichotomous outcome variables. Question 11 was already dichotomised (yes/no) but Question 11 needed to be decomposed. Respondents answering strongly disagree, disagree or neutral were categorised as “No” and respondents answering strongly agree or agree were categorised as “Yes” to Question 10.

A total of two multiple logistic regressions were completed. There were a total of 72 (29.75%) missing cases in first logistic model for Question 10 and a total of 79 (32.64%) missing cases in the logistic model for Question 11. A missing case resulted when a respondent was missing data on any of the variables used in the model.

Table 14 shows the results of the first multiple logistic model using gender, age category and year level to predict responses to Question 10. Age category was found be statistically significant. According to the Odds Ratios (OR) respondents under the age of 20 and between 21 and 30 were significantly more likely to answer “Yes” to Question 10 compared to respondents 31 and over, OR 3.21 (95% CI, 1.26 – 8.18) and OR 3.17 (95% CI 1.16 – 8.69) respectively. Altogether these results indicated that the younger age groups were significantly more likely to state that they would be willing to use alternative methods of PRS compared to older respondents. Figure 12 illustrates this relationship where the 31 and over category is associated with a higher proportion of respondents answering “No” compared to the lower age categories where there are a higher proportion of respondents answering “Yes”.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Level</th>
<th>OR</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>0.89</td>
<td>0.44</td>
<td>1.80</td>
</tr>
<tr>
<td></td>
<td>Female*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age Category</td>
<td>Under 20</td>
<td>3.21</td>
<td>1.26</td>
<td>8.18</td>
</tr>
<tr>
<td></td>
<td>Between 21 and 30</td>
<td>3.17</td>
<td>1.16</td>
<td>8.69</td>
</tr>
<tr>
<td></td>
<td>31 or over*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Year level</td>
<td>1</td>
<td>0.94</td>
<td>0.30</td>
<td>2.93</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1.04</td>
<td>0.28</td>
<td>3.94</td>
</tr>
<tr>
<td></td>
<td>3*</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Reference level
Table 15 shows the results of the second multiple logistic model using gender, age category and year level to predict responses to Question 11. Year level was found to be statistically significant. According to the OR, respondents in 2\textsuperscript{nd} year were significantly more likely to answer “Yes” to Question 11 compared to 3\textsuperscript{rd} years, OR 4.44 (95% CI, 1.08 – 18.27). This result indicates that the 2\textsuperscript{nd} years were significantly more likely to state that they would be willing to take compatibility for alternative methods of PRS into consideration when purchasing future mobile phones when compared to 3\textsuperscript{rd} years. Figure 13 illustrates this relationship where the 2\textsuperscript{nd} years are associated with a higher proportion of respondents answering “Yes” compared to the 3\textsuperscript{rd} years where there is a higher proportion of respondents answering “No”.

**Table 15**  
Multiple Logistic Regression Model Predicting the Purchase of Alternative Methods for PRS (Question 11)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Level</th>
<th>OR</th>
<th>95% CI for OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>1.01</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>Female*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Age Category</td>
<td>Under 20</td>
<td>0.73</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>Between 21 and 30</td>
<td>0.45</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>31 or over*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Year level</td>
<td>1</td>
<td>1.79</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4.44</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>3*</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*Reference level
Figure 13: The Relationship Between Year Level and Question 11