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Read, listen and learn

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'Read, listen and learn' research project report June 2011

SCU Library sincerely thanks all those who participated in this project.

Introduction

Learners today exist in an increasingly multimodal environment. Mobile devices provide extra levels of flexibility for such learners, providing them with both auditory as well as visual input– allowing them to learn anytime, anywhere and while doing anything (Cochrane & Bateman, 2010; Herrington, Herrington, & Mantei, 2009; McGarr, 2009; Peters, 2007).

Libraries globally are exploring ways to deliver the myriad of quality information resources available to their users – via mobile devices (Coombs, 2008; Lippincott, 2010; McKlernan, 2010; Starkweather & Stowers, 2009). Other studies have focused on the range of library services on offer, and the issues associated with such services (Aldrich, 2010; Walsh, 2010; Wilson & McCarthy, 2010).

Traditionally, academic libraries have provided access to predominantly text-based materials. However, as Eisenwine and Hadley (2011, 5) state, 'the digital generation prefers parallel processing and multitasking as a way of digesting information. In addition, that generation prefers pictures, sounds and video over text'. This need to support varying learning styles provided the impetus for exploring audio-based alternatives to the academic literature. In particular, this project sought to identify the preferences of the 'mobile' SCU community in relation to accessing quality academic literature (in particular, journal articles).

More than podcasts

The pedagogical value of providing audio-based resources, especially podcasts, has been well documented (Hew, 2009; Kervin, et al. 2006; McGarr, 2009; Tempelhof, et al. 2009). Generally, such podcasts have been based on lecture materials or supplementary materials designed to support specific units. Other examples include the provision of conference or workshop presentations. Little has been written evaluating the use of audio forms of published and/or scholarly literature.

Between 2008 and 2010, database vendors began providing audio files of selected academic literature. Factiva led the field with linked audio files for all their articles (with less than 4,000 words). EbscoHost and Gale Cengage followed suit, providing audio files for fulltext HTML documents, but not PDF files. All three vendors provided an immediate 'listen' function, and the facility to download an MP3 version. Ironically, despite providing the first mobile database platform, EbscoHost disabled the 'audio' function for mobile devices. EBook Library (EBL) provided a 'read aloud' facility within their ebook collection, but not downloadable MP3 files.

Research project

In January 2011, SCU Library invited the University community to participate in a research project to evaluate the use and usability of audio files as learning tools. The 'Mobile Resources' Library guide (<http://libguides.scu.edu.au/mobile>) incorporated a research project tab, which linked to selected journal articles (on m-learning / e-learning) with both text and audio formats. A screencast provided instructions on downloading and listening to the selected articles, and a link was made to the survey tool (Appendix A).

Forty-two responses were received, from both staff (15%) and students (85%). This low response rate was not unexpected as the project was undertaken during the traditionally quiet, Summer Session of the academic year. All faculties and schools within the University were represented, and there was an interesting spread across age ranges (see Table 1).

Table 1: Age of respondents

| Age ranges | Responses |
|------------|-----------|
| 18-19 | 1 |
| 20-29 | 5 |
| 30-39 | 8 |
| 40-49 | 15 |
| 50-59 | 5 |
| 60- | 7 |

Of the student cohort, 41% were studying internally, 6% were offshore students, and 53% were studying at a distance.

Survey participants were asked to comment on how effective they found a particular format for their learning, and which article format they'd prefer to access on their mobile devices. The full list of survey comments can be found in Appendix B. 64% of respondents stated they would like to have access to both formats.

Many of the positive comments concerning both text and audio formats of the articles reflected the general advantages of mobile devices – i.e. convenience and flexibility.

It's a lot easier than lugging around a huge text book or pages that add to clutter and can get lost.

Not surprisingly, the main criticisms of accessing 'text' on a mobile device related to screen size and associated reading difficulties. Some respondents also commented on the limited or non-existent 'note taking' functionality on some devices.

Words too small to read.

I like to use the hard copy so I can make notes and add post its.

Having audio access to journal articles was a new feature for many of our survey respondents, and this was reflected in their overwhelmingly positive comments.

As I am an international student, this format assists me to develop my listening skill.

It was excellent. How good, can we have all the journals being available to listen to?

I prefer reading for academic-related info, however I found podcasts useful. I would download audio to my mobile device and play it while driving, or maybe peeling carrots, etc... This sort of facility would be very useful for me.

However, despite the positive responses, almost all criticisms of the audio format pertained to the voice quality– its synthesized nature and speed of delivery.

But I want a human voice rather than a computer generated one.

I found I was able to read much quicker than the speaker was relaying the txt.

Having access to both text and audio formats was the most popular approach (64%).

This is such a great idea and I hope the time and effort is put in to make this a freely available tool for all students. Accessing the data in both audio and text format is so invaluable as a greater understanding is gained by using both styles of learning. It is a far more complete experience.

Although I did notice that when I read the article after listening to it I picked up some things I hadn't when just listening.

Listening is good but reading can allow clarification.

Of the respondents, 10% stated that they would prefer to access neither format on a mobile device. Generally these comments reflected a preference for print materials.

With a difficult article I need to study what is being said with frequent backtracking. I usually prefer to print the difficult papers.

Mobile access

Survey respondents were asked about their brand of mobile device. This information has been forwarded to the Chair of the IT&TS Mobile Devices Working Party, and to Library staff involved in the development of the m-lib website.

While Apple products formed the large majority (64%), even within this small study group there was a range of devices listed. This reflects the current debate surrounding optimised or dedicated mobile sites, rather than dedicated apps (Kneebone, 2011).

Table 2: Mobile devices

| Brand / device | Responses |
|--|-----------|
| iPhone | 15 |
| iPod | 8 |
| iPad, HTC | 5 each |
| Samsung | 3 |
| Nokia, MP3 | 2 each |
| iRiver, Motorola, Blackberry, HP Ipaq, ACER Notebook, Sony eReader | 1 each |

Respondents were also asked about their current use of Library resources, via their mobile devices. Of the 38 responses to this question, 75% stated that they hadn't used any Library resources (at least prior to this exercise). The remaining 25% had accessed a range of database / journal resources, e-books and e-readings. This percentage was surprising as at the time of the survey, the Library website had not been mobile-enabled.

When asked what Library resources they'd *like* to access via their mobile device, the following responses were given (Table 3). Some respondents asked for resources beyond the scope of the Library— including the Blackboard app and mobile access to Elluminate. This feedback has been passed onto the Flexible Learning and Development Service (FLDS).

Table 3: m-Library resources

| m-Library resources - wishlist | Responses |
|---|-----------|
| Databases and journals | 9 |
| Nothing – happy with print, or computer access | 7 |
| Everything | 6 |
| e-books ; Library catalogue | 5 each |
| Audio files (incl new resources in subject areas, journal articles) | 3 |
| iPhone / iPad app for key Library resources ; audio books | 2 each |

Unit-based cohort

In conjunction with this research project, the text and audio for selected articles - relevant to two assessment tasks - were embedded in online course material for a postgraduate unit (Foundations of Management) within the School of Business. This cohort was keen to embrace new learning technologies – being time poor, yet with ready access to technology, internet and mobile networks. Students provided informal feedback via a virtual focus group within Blackboard.

Feedback both on the forum and via the student discussion lists within the unit 'Foundations of Management' indicated a lack of expertise in downloading (usually via iTunes) and managing the files. Students discussed technical frustrations that diminished their experience. In response, the SCU Library and Flexible Learning Development Services (FLDS) are developing a 'software toolkit' with advice and screencast instructions on managing multimedia files.

Students on the forum were enthusiastic about resources provided in multiple formats for use on mobile devices. One student explained that he was able to expand his study time by listening to audio content on his daily commute to work. For these students, the overwhelming response was that providing material in multiple formats allowed them to utilize their time better, and use different formats to optimize 'reading' time.

Audio investigations

As a result of this feedback, SCU Library staff continued to investigate opportunities for providing both text and audio forms of academic literature to their users. Feedback was provided to those database vendors who offer an audio alternative to the academic literature, based on respondent comments. The provision of such services by other database vendors is being monitored on an ongoing basis, and new resources are promoted when available. Journals providing their own podcasts (e.g. *Nature*, *Wall Street Journal*, and *New England Journal of Medicine*) have also been explored and promoted (Tempelhof, et al. 2009).

In addition to providing access to existing audio files, the Library hoped to generate audio files (using text-to-speech software) for unit eReserve materials. However, there are a number of implications pertaining to the creation and distribution of 'adaptations' of such literature. Each publisher or vendor applies varying restrictions or negotiates specific licence agreements, and having to investigate this on a document-by-document basis would not be cost or time-efficient. In one study (Miller and Piller, 2005) audio versions of set readings were created. There were a limited number of readings involved and permission was sought for each reading.

While institutions are bound by copyright and licensing restrictions, individuals are able to create such files, solely for personal research or study. It was decided to explore the possibilities inherent in making text-to-speech tools available to university students and staff.

Text-to-Speech

Text-to-speech tools (or speech synthesizers) have been in use for many years, often for accessibility purposes or to support language students. Such tools are equally valuable for auditory learners, and some interesting applications of these tools include essay revision, assisting struggling readers, and providing narration for web lectures (Balajthy, 2005; Chong, Tosukhowong and Sakauchi, 2002; Garrison, 2009).

As stated by Rughooputh (2009, 137), 'Research into personalization and individual learning preferences has shown that the use of multi-modal approaches to delivery can help improve learning experience of learners irrespective of whether in classrooms or through distance education'. This reinforces the comments made by a number of the survey participants.

A range of free and commercial text-to-speech software tools and applications have been identified and evaluated. Criteria used for evaluation included ease of use, voice quality, choice of accents and speed, file size and format, as well as cost. As with the audio files provided by database vendors, the quality of 'voice' was seen to be a key consideration. A selection of these tools has been documented, along with key features and comments, and this information is available on the Text-to-Speech tab within the 'Mobile Resources' Library guide (<http://libguides.scu.edu.au/mobile>).

As mobile devices are more than just 'phones', both desktop-based software and mobile applications were investigated. Thus, all users are supported – whether they have high-end mobile devices including smartphones, or basic MP3 players. This ensures both an equitable and flexible service.

I will still access files via the web and then load them onto my phone from my computer (it is cheaper that way).

Selected participants in this research project were approached to explore these text-to-speech resources, and individual feedback has been extremely positive. Students and staff reported using these tools to create MP3 files of journal articles, selected eReadings and course materials, book chapters and book sections, web pages, newspaper articles – just to name a few. All the respondents commented on the value of these tools, and the increased flexibility they provided them as mobile learners. They also reinforced the comments from the initial survey, on the value of having multiple formats of the same resource.

Conclusion

'Novelty is probably one of the most powerful signals to determine what we pay attention to in the world' (Poldrack, 2010, 1of9). While the use of audio files or podcasts in the academic environment is not new, the ability to access audio forms of scholarly literature is a recent development. In addition, enabling staff and students to create their own personalised collections of audio files - generated from text based resources - is both novel and empowering for mobile learners.

This project has demonstrated that scholarly literature can be re-purposed to suit a variety of learning styles, particularly in the mobile setting. While the Library may not be able to 'create' audio files for distribution to their users, it can lobby database vendors for increasing access to quality, audio files of scholarly literature, and can promote the existence of text-to-speech tools that may enhance individual learning.

In response to the research findings, the SCU Library, FLDS and the Teaching and Learning Centre (TLC) are also collaborating on the development of 'mobile literacy' resources, enabling students to navigate the technical complexities of creating or downloading and listening to content via mobile devices.

As Low and O'Connell (2006, 2of13) note, 'the highly personalised nature of digital mobile devices provides an excellent platform for the development of personalised, learner-centric educational experiences'. By providing opportunities for learners to both create and access multi-format and mobile- ready scholarly resources, the Library continues to support mobile (and indeed all) learners in their academic endeavours.

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Appendix A: Mobile access to articles - text and audio

We would appreciate any feedback about your preferences for accessing journal articles via your mobile device in audio and/or text format.

Part 1: Mobile access to journal articles

Q1. Did you **read** the recommended article(s) on your mobile device?

- Yes
- No

Q2. If you answered Yes above, did you find this format effective from a learning perspective?

- Yes
- No
- Why?

Q3. Did you **listen** to the recommended article(s) on your mobile device?

- Yes
- No

Q4. If you answered Yes above, did you find this format effective from a learning perspective?

- Yes
- No
- Why?

Q5. Which article format would you prefer to access on your mobile device, from a learning perspective?

- Text
- Audio
- Both
- Neither
- Why?

Part 2: Demographic Information

We would like to ask you for some background information so that we can describe the sample of people who complete this questionnaire.

Q6. Gender:

- Male
- Female

Q7. Age In Years:

Q8. SCU affiliation: (please select both if appropriate)

- Student
- Staff

Q9. If you are a student, what is the mode of delivery for your units? (You may select more than one mode).

- Online
- Internal
- External
- Offshore

Q10. If you are a student, are you?

- Undergraduate
- Postgraduate

Q11. Which school or department are you affiliated with?

Part 3: Your mobile access

Q12. What brand/model (if known) of mobile device do you currently use?

Q13. Which SCU Library resources do you currently access, using your mobile device?

Q14. What SCU Library resources would you like to access, using your mobile device?

Your participation in this research is greatly appreciated. Thank you!

Appendix B: 'Read, Listen and Learn' survey comments

Text : Positive comments

Its a lot easier than lugging around a huge text book or pages that add to clutter and can get lost.

It was readable, and clear

I CAN TAKE WITH ME TO WORK AND READ DURING A BREAK

It made it easier for me to access the articles whilst on the go. It can read articles while doing household chores such as cooking. Not having to open up such a big device as my laptop, is easier and a time saver. If I am bored it's right there.

More mobile than sitting at a computer work station. Was able to relax in own environment.

I have read from the mobile device for several years now (including new articles, e-books, etc). Therefore, I am quite used to this method. Thus I find being able to access journal articles via mobile devices extremely useful.

It's good to not have to always be sitting at the computer to study. I like being able to study outside but can't when I don't have wireless internet at home. However I just bought an iphone so this study method would be very handy.

It is easy to read however, in the format presented, highlighting and notation are not possible.

I can read - re-read - go at my own pace

Text: Negative comments

Difficult to read large quantities of text on a small screen.

Text too small for such a long article.

I think this is a great idea. However, I have difficulty with the font size and I was unable to change the font size. Otherwise, I think this is the best possible way for students. It makes it much more affordable and a lot less to carry.

With a difficult article I need to study what is being said with frequent backtracking. I usually prefer to print the difficult papers. Lightweight articles are fine to read as an ebook but for audiobooks only the lightest of reading material eg Terry Pratchett :-)

words too small to read

Audio: Positive comments

As I am an international student, this format assists me to develop my listening skill.

it was excellent. how good, can we have all the journals being available to listen to ?

You can listen anywhere at any time.

Will allow me to listen to articles while travelling

Reading can be very tiring. Hearing the article helped relax the eyes and tune into the audio. However, it would be good if the text to speech could be sped up as desired. Audio and following text on screen was best in complex sections.

I listen to a lot of podcasts so I'm used to receiving information this way, it means that I can use time that would have been wasted such as driving to learn.

if for some reason reading was going to be difficult (ie. as a passenger on bus or train), hearing an text to audio could be beneficial.

Much easier to keep track and understand what the article was about.

I spend 2 hours a day driving to uni and home and this type of platform is perfect for my situation.

I could hear while driving. Plugged iphone into car speakers.

much esey to care and have at all times [sic] (Much easier to carry and have at all times)

I CAN LISTEN TO THROUGH THE CAR RADIO WHILST DRIVING, ABLE TO LISTEN TO A NUMBER OF TIMES

I didn't but I have a grandson who finds using a mobile device much easier to understand and take in information when you can listen to it again and again.

Very accessible and very time efficient as we can listen to a journal or lecture when ever we have a moment spare rather than print out the reading to have handy. Saves time and paper.

Was able to concentrate with headphones.

audio enhances memory retention and understanding, although the computer generated voice is a bit stilted.

Easily accessible so you can fill in any free time in your day with a reading or a lecture. Saves resources - time and paper.

Helps to understand what is written better for me and I got through the paper quicker as I am dyslexic

This could be effective and a useful adjunct to reading the article. The automated voice was annoying - especially as the pauses were all in the wrong places. The flow didn't follow the sentence construction and therefore intruded on the capacity to comprehend meaning.

Audio: Negative comments

The computerised voice is difficult to listen to and understand.

But I want a human voice rather than a computer generated one

I could have listened to it on my PDA but why bother? It is the same horrible voice as on the computer. Computer generated voices are terrible to listen to. I would rather read the article as an ebook.

The article I listened to sounds artificial as if produced by a computer generated reader and that is very distracting. I often listen to recorded lectures such as those available for iPhone from Yale University and I find those effective.

Funky voice made understanding difficult esp. with a recurring mistake between visual and audio of one word (Florida/Flat). Concept was good; delivery was not.

It took me longer to download and transfer the article to my device than it did to read it on line. I could not highlight text as I read. I found the voice mechanical and boring.

the speech was disjointed and I found it frustrating to listen to

The computer reading is a bit hard to listen to as it seems to have difficulty flowing like a live reading.

The Factiva reader did not read well. The phrasing was sometimes not good, so it was difficult to understand the content.

The completely unnatural inflections, jarring rhythm and odd pauses blocked my intake of the information. I actually have no recollection now of the substance of the article. In fact it was so irritating to listen to that it changed my mood and killed any desire to listen and absorb.

The computerised/automated audio reader had trouble reading certain words. For example, in the "University explores mobile technology" article, the audio reader treated iOS as a word and read it out as a word. It should have been read as individual alphabets i-O-S. It was a little confusing and I had to refer to the text to understand what the audio reader was reading. The audio reader has significant difficulties with hyphens. My second article was "The end of textbooks as we know it" had numerous hyphenated words/phases, eg, e-textbooks, McGraw-Hill and old-fashioned copy--a book. In the first case, the audio reader emphasised the 'e' and had a pause before reading 'textbooks'. For the second case the reader read out 'M' then 'C' followed by Graw-Hill. Finally, the final phase

seemed to have stumped the audio reader when it read as 'old'. slight pause, then 'fashioned copy' followed by a longer pause, then 'a book'. When used as a recreational reader, the audio reader may be useful. However, I had to listen to each of the articles at least twice and only with reading the text myself, was I able to understand the article.

But did not have to digest graphs, tables, new or complex technical words which would be more time consuming and could interrupt the timing of the speech pattern.

Very different. The only problem is that the voice is so mechanical. I don't feel very comfortable it seems impersonal. I prefer to read the article, but I can see it's usefulness for handicap students.

Get a human to read it rather than a clunky computer or it will just annoy people and promote the use of incorrect pronunciation among the younger people

I learn better by reading text

I didn't find it as good as self-reading. The synthetic voice is good, but not perfect. I like to be able to go over, re-read some parts if they are novel, or a little more complex.

teh formatting in html is dojointed - I would have preferred to have it as a pdf to follow

as most audio uses american voices. I find them hard to understand

Preferences for both audio & text: Comments

Using both styles of learning, auditory and visual gives a far greater accessibility to the learner resulting in a deeper understanding.

I could scan the script as I listened.

A great tool to enhance the learning process. When using both auditory and visual text a far greater understanding is achieved as a wholistic approach is experienced. The auditory delivery could definately be improved which could make the difference between students listening and not. A great oppotunity to improve the learning process. Keep up the good work.

This is such a great idea and I hope the time and effort is put in to make this a freely available tool for all students. Accessing the data in both ausio and text format is so invaluable as a greater understanding is gained by using both styles of learning. It is a far more complete experience. However, some work needs to be done with the sound of the audio reader to make it more desirable. This could be the difference between people using this tool and not. Keep up the good work this is definately going to be a winner.

It's great to have a break from reading. However it's a shame the voice sounds so computerised as it makes it hard to follow unless you're reading the article at the same time

Although I did notice that when I read the article after listening to it I picked up some things I hadn't when just listening.

As an older person I like (and am used to) listening to learn. But it is also good to have the text to revise the subject matter.

I found I was able to read much quicker than the speaker was relaying the txt, however, with the amount of reading time available to us, as it takes total concentration, being able to listen while walking, driving, on the train etc has huge benefits. Having the txt means you are able to refer back to specifics if needed.

Both is preferable as I can access them via both iPod and iPad. I won't always want to receive them the same way it will depend what I am doing and when I can read them.

I can access anywhere by either method at any time.

because i read faster than the text reader does, i found it mildly annoying to listen to. however, having the option to go back and read the text was handy. i did find it difficult to be able to backtrack the audio if i didn't hear properly (was interrupted) or wanted to re-hear a specific section.

Love the audio aspect but it would be great to be able to refer back to the text if need be.

One can reinforce and/or clarify the content of the other.

Audio assists me when the font is not large enough. But I can also listen whilst I do other activities such as cooking a meal.

Having access to both formats would be great. You can read the visual text when appropriate re: environment and listen to the audio text where reading is not possible. Very versatile. I also found it was good to have the text in front of you while you listened to the audio - if you happen to miss the audio you can pick it up again visually.

Choice for different situations

People have different learning styles.

Audio would be suitable on mobile device and text could be downloaded for reference purposes

I would like the choice to suit my method of study at the time. I would prefer the talking book/article but if it was the digitised speaker then I would trash the file and use the text.

Following my earlier comments with regards to both formats, I feel that the audio format does have it's perks in that it helps the listener through a good portion of the article. Thus, during portions that the audio is not clear, the user can simply refer back to the text for verification. I believe the two formats are quite complementary.

If the voice read more smoothly, it would be handy to have audio. However, I like being able to re-read sentences and see what is in each paragraph so I can skip to which parts I'm interested in. Also,

I think having only audio is a bad idea in a way, as reading text greatly helps my spelling and grammar.

Listening is good but reading can allow clarification

Some people learn faster by listening and others by seeing- this can do both at the same time.

Each one assists the other in learning

The alternatives provide an opportunity to vary the manner in which the information is acquired. I'd like to have access to all three methods. This would provide greater flexibility and would be most useful with particularly dense writing that requires either very slow reading or multiple attacks to ensure full comprehension.

I prefer reading for academic-related info, however I found podcasts useful. I would download audio to my mobile device and play it while driving, or maybe peeling carrots, etc... This sort of facility would be very useful for me.

I like to have a solid copy of articles to read and highlight, I am a ludite that way. However I could download audio to listen to on a cd or Ipod as I drive.

Mostly for audio, but also for text to search sections having heard it, and to transfer to home computer.

Neither

Those who responded with 'Neither' did not include any comments when asked 'Why'