

International Journal of Interpreter Education

Volume 5 | Issue 2

Article 4

2013

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Jemina M. Napier

Heriot-Watt University, J.Napier@hw.ac.uk

Zhongwei Song

Macquarie University, zhongwei.song@mq.edu.au

Shiyi Ye

Macquarie University, shiyi.ye@mq.edu.au

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Recommended Citation

Napier, Jemina M.; Song, Zhongwei; and Ye, Shiyi (2013) "Innovative and Collaborative Use of iPads in Interpreter Education," *International Journal of Interpreter Education*: Vol. 5 : Iss. 2 , Article 4.

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Innovative and Collaborative Use of iPads in Interpreter Education

Jemina Napier¹

Heriot-Watt University and Macquarie University

Zhongwei Song

Macquarie University

Shiyi Ye

Macquarie University

Abstract

This article reports on findings from a collaborative action research project that was conducted to investigate the use of iPads in teaching interpreting students. Action research is well documented as a method for encouraging innovation and change in education, and it has been applied in translation and interpreting educational research. The goal of the project was to investigate how iPad technology can be used to enhance the learning experience for interpreting students in a master's-level Conference Interpreting program, with an evaluation of the benefits of using the iPad generally and in relation to the development of interpreting skills, as well as through one particular iPad application (AudioNote). The project incorporated periodic cycles of evaluation to reflect on the effectiveness of the use of iPads in this teaching context, for instructors and students to share information about what applications they had found, and to design learning and teaching activities together using those applications. The iPad applications downloaded by students can be categorized into three main areas of learning: general study, language enhancement, and interpreting skills. Recommendations are made about how iPads can be used innovatively and creatively in educating interpreting students of any language combination.

Key Words: interpreter education, innovation, collaboration, action research, iPads

¹ Correspondence to: j.napier@hw.ac.uk

Innovative and Collaborative Use of iPads in Interpreter Education

1. Introduction

According to Taylor (2010, 2011, 2012, this issue), the current generation of higher education students are different kinds of learners than those who came before them; today's students are "digital natives" (Taylor, 2010). Advances in technology are having a major impact on education generally and influencing the way that students learn, and "rather than complain about students' technology and online preferences, [we] need to embrace technology and leverage it for academic and developmental means and ends" (Taylor, 2012, p. 44). Furthermore, Taylor (2012) suggests that we utilize technology to make students more accountable for their own learning, and to bring innovation into the classroom. This article provides details of an innovative and collaborative educational research project that sought to do exactly as Taylor suggests: to embrace one particular form of technology (the iPad), to use the iPad innovatively to engage students in the learning process, and to work collaboratively with students so they could guide (and thus be accountable for) their own learning.

The goal of the project was to investigate how iPad technology can be used to enhance the learning and teaching experience for students and staff, with the evaluation of one particular application on the iPad, AudioNote. The project piloted the use of the iPad in teaching English-Chinese conference interpreting students, with a view to broader use across the university in teaching general note-taking skills to promote active learning. For interpreting students, activities were designed specifically to enhance short-term and working memory, note-taking skills, listening comprehension skills, and summarizing skills. Throughout the course of our project we found that students identified applications (apps) that could be allocated to three different categories of learning. In this article we discuss the collaborative research approach, including the identifications of apps and the design of teaching activities, and evaluate the iPad use for general study skills and the development of interpreting skills. We also relate various apps to Bloom's Revised Taxonomy of learning behaviors (Anderson, Krathwold, & Bloom, 2001), and we conclude with recommendations for particular apps that interpreter educators may put to use in the classroom.

2. Background to the Study

In order to give background to and contextualize the study, we begin by describing the interpreter training context at Macquarie University in Sydney, Australia, where the study took place. We then provide further contextualization by providing an overview of relevant literature and giving consideration to theories of learning at college, technology and learning, what interpreters need to learn in terms of their professional skills, and interpreting pedagogy and technology.

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2.1. Conference Interpreter Training at Macquarie University

The conference interpreter training program at Macquarie University was established in 2005 and is offered as part of a suite of postgraduate translation and interpreting (T&I) programs² that provide training to students who are already bilingual in English and another language. The T&I programs are offered in Chinese (Mandarin), Korean, Japanese, and Australian Sign Language (Auslan); a non-language-specific program in community interpreting for people from “emerging language” communities (Slatyer, 2006) is also offered. Historically, the master’s in Conference Interpreting was offered in Chinese (Mandarin), Korean, and Japanese, but at the time the study took place it was offered only to Chinese-speaking students. The program is offered as a full-time, 1-year program, and entry criteria require students to already be accredited as a professional interpreter in Australia or to have completed a master’s level degree in T&I with demonstration of high-level skills in interpreting.

The overarching aim of the program is to enable students to become highly competent professional conference interpreters, who will likely return to China on completion of the program to work in high-level national and international conferences on a range of topics including economics, trade, medical research, environmental issues, and international relations, politics, and systems. To this end, the program combines theoretical and practical subjects taught by a range of instructors with conference interpreting experience, which are designed specifically to give students (as close to authentic as possible) simulated conference interpreting experiences using simultaneous interpreting booths such as those at the United Nations and in the European Parliament. Based on previous student feedback, it has been noted that students choose to engage specifically in conference interpreter training at Macquarie University because of its solid reputation in providing the learning environment that equips them with the academic knowledge and practical skills that they need to acquire in order to practice as professional conference interpreters.

2.2. Learning in the University Setting

Learning at college (university) is viewed as a generative process, and students are expected to develop the ability to employ available knowledge to solve new problems and to gain new knowledge as the need arises (Bernardini, 2004). To this end, two sets of knowledges and skills are required: domain-specific and generic. While *domain-specific* knowledge and skills are considered important, 21st-century education places great value on transferable generic skills (Sluijsmans, van Merriënboer, van Zundert, & Könings, 2012). *Generic skills* are largely defined as process skills: those skills—such as communication, problem solving, critical thinking, and lifelong learning—that students are expected to develop in tandem with the acquisition of knowledge and domain-specific skills, and which are used beyond disciplinary content knowledge (Barrie, 2004; Drummond, Nixon, & Wiltshire, 1998). Didactically, generic skills are widely recognized for the value and capacity they have to transfer skills across domains, in that they are able to help effectively solve domain-related problems (Barrie, 2006; Drummond et al., 1998; MacNair, 1990). Ericsson and Charness (1994) argued that if one wants to reach an expert level of performance in any particular domain, it is necessary to master all relevant knowledge and prerequisite skills in that domain.

More importantly, it is believed that, to acquire expertise in a specific domain, one must obtain specific knowledge while at the same time developing and using generic skills to extend that knowledge beyond the domain (Glaser, 1987; Green & Gilhooley, 1992; Hoffman, 1997; Scribner, 1984). The acquisition of these generic skills enhances the application of domain-specific skills to the ever-changing demands of the work environment (Kemp & Seagraves, 1995; Leckey & McGuigan, 1997). Thus, generic skills are interrelated with, and complementary to, domain-specific skills in ensuring a connection between learning in the university and working life (Tynjälä, Välimaa, & Sarja, 2003).

Nonetheless, balancing the teaching of domain-specific knowledge and skills with the development of generic skills, particularly more transferable skills, is a challenge, and it can be difficult to integrate the two sets of skills within curricula (Badcock, Pattison, & Harris, 2010). For this reason, Macquarie University has clearly set out

² See <http://www.ling.mq.edu.au/postgraduate/coursework/tip/programs.htm>.

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recommendations for the “graduate capabilities” that they expect all students should be able to demonstrate when they complete their chosen program of studies. These include the following:

- Discipline-specific knowledge and skills (domain-specific skills)
- Critical, analytical, and integrative thinking (generic skill)
- Research and problem-solving capability (generic skill)
- Effective communication (generic skill)
- Engaged and responsible, active, and ethical citizens (generic skill)
- Capable of professional and personal judgment and initiative (generic skill)

All programs must be mapped against these graduate capabilities and learning outcomes designed accordingly. Macquarie also places great value upon, and encourages instructors to embed, the following pedagogical approaches and teaching practices into all programs: (a) student-centered teaching (Rogers & Freiberg, 1994), (b) reflective learning for critical thinking (Baker, 1996), (c) problem-based learning and teaching (Schwartz, Mennin, & Webb, 2001), and (d) cooperative and collaborative learning and teaching (Leigh Smith & MacGregor, 1992). Adopting such pedagogical approaches reinforces core adult learning principles, as outlined by Knowles, Holton, and Swanson (2005):

- Adults are internally motivated and self-directed.
- Adults bring life experiences and knowledge to learning experiences.
- Adults are goal oriented.
- Adults are relevancy oriented.
- Adults are practical.
- Adult learners like to be respected.

Embedding these learning principles and pedagogical approaches motivates students (Small & Lankes, 1996) and enables self-directed learning. *Self-directed learning* centers on the control of learning activities (Garrison, 1992, 1997) and can improve “higher-order” generic skills, including information retrieval, time management, goal setting, problem solving, and critical thinking skills to promote lifelong learning (Candy, 1991). *Cooperative learning* is a natural pedagogical approach to use in the adult education classroom (Thistlethwaite, 1994) as it can contribute to higher self-esteem and achievement, increased attention and perspective taking, greater social support, more on-task behavior, and greater collaborative skills and intrinsic motivation among students (Johnson & Johnson, 1991). As Taylor (2010, 2011, 2012, this issue), points out, harnessing technology in teaching can enhance the learning experience for students in the college environment.

The goal in developing generic and domain-specific skills in graduates is to enable them to respond to an ever-changing working environment. Students are thus expected to have the capabilities to regularly reflect upon their skills and competencies and engage in lifelong learning for expert performance in an individualized and effective manner. In discussing how to make education and training more individualized and effective in interpreting, Ericsson (2000/2001) indicated that two conditions are prerequisite: a better understanding of the mechanisms mediating expert performance, and the improvement of instruments to assess those mechanisms. To put it simply, technology can play an important role in learning in general, and in developing generic and domain-specific skills in particular. Technology is first and foremost a means to fulfill a human purpose (Arthur, 2009), but it is also a means to achieve life goals, including (among other things) increased efficiency, opportunity, complexity, diversity, specialization, and freedom (Kelly, 2010).

Given that the 21st century has witnessed increasing attention paid to the teaching and assessment of generic and domain-specific skills (Badcock et al., 2010), the use of emerging technology can facilitate graduates’ learning of transferable skills across domains more effectively and efficiently. The goal of this particular project was to examine the use of emerging technology in the development of generic and domain-specific skills in interpreting students. Before we describe the project and the outcomes in more detail, we first take a look at what generic and domain-specific skills interpreting students need to develop, and the pedagogical principles adopted at Macquarie University for training interpreting students.

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2.3. *Interpreting Skills and Pedagogy*

In giving consideration to the key attributes required of a competent interpreter, Gerver, Longley, Long, and Lambert (1984, p. 19) propose the following:

1. Profound knowledge of active and passive languages and cultures.
2. Ability to grasp rapidly and to convey the essential meaning of what is being said.
3. Ability to project information with confidence, coupled with good voice.
4. Wide general knowledge and interests, and a willingness to acquire new information.
5. Ability to work as a member of a team.

If we “translate” these attributes into the language of learning, and map them as “graduate capabilities,” we might suggest that interpreting students be required to demonstrate the following domain-specific and generic knowledge and skills upon graduation:

Discipline-Specific Knowledge and Skills

- Bilingual language abilities
- Theoretical knowledge
- Interpreting competence

Critical, Analytical, and Integrative Thinking

- Self-analysis of skills
- Peer support

Research and Problem-Solving Capability

- Assignment preparation
- Adaptability

Effective Communication

- Linguistic ability
- Interpersonal skills

Engaged and Responsible, Active, and Ethical citizens

- Ethical behavior
- Professional integrity and solidarity

Capable of Professional and Personal Judgment and Initiative

- Ethical behavior
- Teamwork

Thus the graduates from the Macquarie University conference interpreting program are expected to have achieved and to demonstrate the following learning outcomes:

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- self-awareness, interpersonal skills, communication and critical analysis skills, problem-solving and creative thinking skills;
- advanced language skills for conference interpreting;
- knowledge of the range of literature on conference interpreting research and practice;
- application of theory to practice of simultaneous interpreting;
- ability to conduct self- and peer analysis and critique of interpretations;
- understanding of the role of the conference interpreter in specific contexts;
- ethical and professional conference interpreting practice;
- application of linguistic analysis in discussion of conference interpreting; and
- utilization of research skills in preparation for, and during, CI work.

The Macquarie University conference interpreting program is designed to initially enable students to consolidate their consecutive interpreting skills by working on listening and comprehension, memory, note-taking and production, before faculty work with them to transfer the skills to simultaneous interpreting practice.

2.3.1 Note-taking

The purpose of taking notes varies in everyday life situations. However different the purpose may be, there are two general aims shared by all: (a) notes enable the note-taker to reproduce and store knowledge for later consultation; and (b) notes can help the note-taker to acquire personal knowledge in a relatively distinct way (Howe, 1975). In other words, note-taking involves not only comprehension (van Dijk & Kintsch, 1983), but also written production (Alamargot & Chanquoy, 2001) that is similar to original composition (Piolat, Thierry, & Kellogg, 2005). Thus note-taking has long been used to assist learning, comprehension, information retention, and knowledge acquisition in college (Tran & Lawson, 2001; Ward & Tatsukawa, 2003). Beck, Bennet, and Wall (2002) urged all college students to acquire this skill as they asserted that taking notes from lectures, class discussion, and reference books encourages deeper comprehension and the organization of incoming information (Peper & Mayer, 1978; Einstein, Morris & Smith, 1985).

To successfully acquire domain-specific knowledge, students are required to have note-taking skills in addition to other basic communicative skills such as active listening and effective reading. Note-taking is thus considered one of the skills that reflect students' generic competence in communication skills required for higher education. It is a particularly important skill for conference interpreting students, particularly when engaging in consecutive interpreting. *Consecutive interpreting (CI)* in conferences is largely defined as a communicative situation in which the interpreter sits with participants in the conference room taking notes of what is being said, and delivers an oral translation at the end of each statement, with or without the help of his notes (Keiser, 1977). Given the important role it plays in the technique of CI (Herbert, 1952), note-taking is unanimously regarded by interpreting studies scholars as a necessary skill for CI (Alexieva, 1993; Allioni, 1989; Bowen & Bowen, 1984; Ficchi, 1999; Gerver et al., 1984; Gile, 1995; Gillies, 2005; Gran, 1990; Ilg & Lambert, 1996; Mikkelsen, 1983; Paneth, 1984; Rozan, 2004; Seleskovitch, 1975, 1999).

As "a unique kind of writing activity that cumulates in both the inherent difficulties of comprehending a message and of producing a new written product" (Piolat et al., 2005, p. 306), note-taking in CI is more difficult given that the notes produced are to be referred to immediately, thus there is an inherent time constraint in the note-taking process. Consequently, notes only need to include a few select words or symbols aimed at converting a given message into its basic concepts (Rozan 1956; Seleskovitch, 1999), while alluding to the structure of the original speech (Gran, 1990). Yet, the limited words or symbols should be relevant enough to constitute the visual representation of the interpreter's analysis of the source speech (Gillies, 2005) and should "bring to light the structure underlying a speech and the general semantic orientation of paragraphs and sentences" (Ilg & Lambert, 1996, p. 82). Hence, notes must be brief and simple (Seleskovitch, 1975).

CI is a complex cognitive process that requires considerable effort (Gile, 1995). It comprises the comprehension and note-taking phase and the speech production phase. The first phase involves listening to the source message, analysis and short-term memory operations that are carried out at the same time as the production of written notes; and the second phase leads to the reproduction of speech in the target language through remembering and reading of the notes produced. Since note-taking imposes significant demands on working

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memory and shared attention, “a note taker must coordinate the attention and storage demands of both comprehension and written production” (Piolat et al., 2005). Any imbalance in the allocation of effort to these concurrent operations can trigger cognitive overload. The effect of cognitive overload is largely manifested in loss of information, misinterpretation, or even communication breakdown.

Since note-taking should be aimed at converting a given message into its basic concepts (Rozan, 1956), what is noted down has to have been chunked and conceptualized, as it has a direct bearing on reformulation and re-expression of concepts or main ideas of the original speech into the target language. To produce notes effectively and economically, one must acquire summarizing skills in general and chunking skills in particular.

Teaching CI is one step in the scaffolded learning development of interpreting students designed to develop the skill of communicating orally between two languages, which will later be applied in the simultaneous interpreting mode. However, to learn note-taking is time-consuming because students have to spend a lot of time finding the most economical and effective way of abbreviating concepts and terms, both on paper and in memory (Ilg & Lambert, 1996).

Researchers and educators (Gile, 2009; Ilg & Lambert, 1996; Pöchhacker, 2003; Rozan, 1956) have defined and modeled guidelines to facilitate the design of training tools to develop interpreting students’ note-taking skills, with consideration given to choice of note-taking language (Van Dam, 2004; Szabó, 2006), how to make sense of notes (Albl-Mikasa, 2008), individual differences and memory in note-taking (Albl-Mikasa & Kohn, 2002; Einstein et al., 1985), and assessment of source language difficulty (Liu & Chiu, 2009).

Despite the consensus over the usefulness of note-taking skills, there are views that doubt the value and necessity of training interpreting students on note-taking (Thiéry, 1976, 1981). The different, sometimes often conflicting, findings and views from experiments on note-taking in various language combinations have only come up with a general consensus on the basic principle of note-taking: that techniques are individualized, and they need to be economical and recognizable.

In an attempt to harness technology, and improve the effectiveness of note-taking skills practice in a pedagogical context, some interpreter educators have introduced the use of digital pen technology (Orlando, 2010). Using a digital pen means that instructors and students are able to capture and align (in real time), the notes taken with the audio of the speech. The process of giving remedial strategies to their students is thus expedited, but requires “colossal work” of the instructor as s/he can only focus on one individual student at a time (Orlando, 2010).

Thus a further investigation of emerging technology in relation to note-taking in the specific discipline of interpreting studies in order to enhance learning and professional practice can also inform note-taking as part of the general active learning process for any college student, and enhance the self-directed, cooperative learning process. This particular study focussed on the iPad (Apple, Inc.), a tablet computer first released in 2010.

3. The Study

The initial primary goal of the study was to test one particular app available through the iPad—AudioNote—for the development of note-taking skills. However due to the organic nature of the project, the broader research goal became to investigate how the iPad can be used to enhance the learning and teaching experience for interpreting students and instructors, and to see how students engaged in self-directed, cooperative learning, and developed skills and competence in interpreting. Furthermore, the idea was to pilot the use of the iPad in learning and teaching for interpreting students with a view to suggesting how the iPad could be used more broadly across the university to promote active, self-directed learning.

3.1. A Note on AudioNote

AudioNote is an app developed by Luminant Software, Inc. and made available via the Apple App Store to “[combine] the functionality of a notepad and voice recorder to create a powerful tool” with the aim to “save...time while improving the quality of notes.” The app enables the user to record audio from a speech and

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simultaneously type written notes into a notes page. At the end of the task, the audio file is then synched with written notes and during playback of the audio, the exact corresponding text in the notes are highlighted as the audio replays. This app was identified as a potentially beneficial resource to support interpreting students in developing listening, comprehension, note-taking and summarizing skills, which are all important for effective interpreting practice.

3.2. Conceptual Framework

The conceptual framework for the study was one of *participatory research*, an established qualitative methodology (Cornwall & Jewkes, 1995; Minkler & Wallerstein, 2008) that is inductive and employs creative methods for collaborative exploration (Chambers 2002). Participatory research enables positive user involvement and empowerment, and “action research” methodology is a common approach to enabling participatory research and for educational research (see Burns, 1999; Kember 2002). *Action research* is well documented as a method for encouraging innovation and change in education (Fullan, 1991). It is a cyclical, reflective process that responds to the context and involves *sensing* (identifying the problem), *reading* (investigating the problem further), *matching* (linking the proposed solution to the problem), and *acting* (implementation; Scott, 1999).

Action research has been previously adopted in translation and interpreter education research (e.g., Cravo & Neves, 2005; Hubscher-Davidson, 2008; Napier, 2005; Slatyer, 2006), and in a major project to review the curriculum of the T&I program at Macquarie University (Napier, 2010; Napier, Dong, et al., 2009; Napier, Slatyer, et al., 2009). Thus we felt it was appropriate to select a methodological approach that was a participatory action research process, where all the conference interpreting students could engage in periodic cycles of evaluation, both student and instructor led, to reflect on the effectiveness of the use of emerging technology in this teaching context.³

3.3. Method and Analysis

The study was funded through a Macquarie University Emerging Technology Projects Grant and involved the purchase of iPads, which were distributed to conference interpreting students and instructors with the AudioNote application already downloaded. Each participant was given an AU\$50 iTunes voucher to purchase other apps. Specific learning and teaching activities were designed to use AudioNote and other apps, and the students were asked to seek out and trial other apps that they identified would assist in their learning and skills development, and to keep a log of all the apps they downloaded and their rating of each. Three instructors then met with the group of participating students on a monthly basis, over one 13-week semester, to share the apps the students had downloaded and discuss how they used them and how effective they were and for what purpose. Between meetings, all students and instructors would then download and explore the recommended apps from the previous meeting, as well as source more apps to discuss at the next meeting. As alternative apps were identified, new classroom activities were created to use new apps, which were suggested by the instructors and the students.

Each classroom discussion was recorded using AudioNote, with one of the instructors taking notes within the same app. The audio files were then fully transcribed for analysis. Thematic analysis was used to identify key themes in the classroom discussions, following a six-stage process as follows:

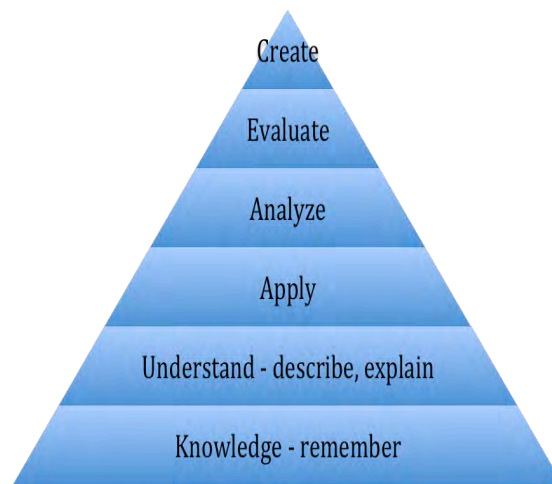
1. Familiarization with data.
2. Generating initial codes.
3. Searching for themes among codes.
4. Reviewing themes.
5. Defining and naming themes.
6. Producing the final report. (Braun & Clarke, 2006)

³ For a detailed overview of the benefits of using participatory action research as an educational research methodology, see Napier, Song, & Ye (forthcoming).

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An evaluation of the students' level of engagement was made by referring to the cognitive domain of the revised version of Bloom's Taxonomy for the classification of learning objectives (Anderson et al., 2001), as shown in Figure 1. An adapted version of the Emerging Technology Projects Evaluation Framework (see Appendix) was also used as guide for discussions and for formal evaluation at the end of the project.

Figure 1: Bloom's Taxonomy (Revised)



4. Results and Discussion

As previously stated, the broader goal of this study was to examine the feasibility of using the iPad in the learning and teaching process of interpreting students, and also to focus on one particular app: AudioNote. We present the results in three categories: (a) the AudioNote app, (b) other apps sourced throughout the action research process, and (c) the overall iPad experience.

4.1. *AudioNote or Not?*

Originally the instructors had envisaged that the use of the AudioNote app could facilitate, and enhance, the learning experience and development of certain skills among interpreting students, including short-term and working memory skills, note-taking skills, listening comprehension skills, and summarization skills. It was also envisaged that AudioNote may complement the instructors' teaching experience. However, in there was a mixed response to this app, and AudioNote was found to be useful only in some contexts.

4.1.1 AudioNote and Interpreting Skills Development

The AudioNote app features an advanced recording system that can capture sound with a high standard of quality, and also has a user-friendly interface that is plain and easy to follow, even for first-time users. The simultaneity feature of this app that enables recording and typing (as described in Section 3.1) means that users can review

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their recording (in this case interpreted renditions) while referring to, and cross-referencing with, basic typed notes.

Such features have a number of benefits to the learning and teaching process with interpreting students. First, unlike other applications, AudioNote can be used to record and play back students' performance immediately, which in turn facilitates a sound cyclical and reflective process of skills practice-assessment-improvement. Through engagement in the action research process throughout our project, we identified that in class, instructors were able to better assist students with specific skills transfer by using the immediate playback function; outside class, this meant that students could also adopt this regular cycle of practice and evaluation, which in turn translated into further consolidation of skills acquired. From an instructor's perspective, having such after-class activities enabled by the use of AudioNote was particularly significant, in that students would assess their own performance with the intention of self-improvement, which is an important component of self-directed study.

Moreover, such recording and playback functions enhanced not only learning and skills transfer on an individual basis, but also peer evaluation and group discussion activities. In such scenarios what students needed was an accurate record of what was being discussed, and AudioNote provided the opportunity for dual modality capture of all analyses of interpreting performance (through audio record and notes). These recordings and notes could then be shared among the student group for effective cooperative and collaborative learning.

One other benefit of using AudioNote during practical interpreting skills activities is that it can run as a background program. This means that once a recording has been activated, it is possible to use the iPad for multitasking and access other apps on the iPad and the recording will continue. This meant that the students could access Web browsers and dictionaries, which can be a vital part of the immediate research skills need while interpreting. In both training and actual practice, particularly when practicing simultaneous interpreting, this feature was found to be particularly helpful in a simulated environment where students could refer to other sources of information as they continued with their interpreting practice and recording of their interpreted renditions. So for the purposes of interpreting skills development, the audio function of AudioNote was particularly beneficial, but this function could also be offered through other apps and devices.

4.1.2 AudioNote and Note-Taking

At the commencement of this project, we envisaged that piloting AudioNote with interpreting students would allow us to evaluate the merits of using iPads generally across the university to enhance general study skills for any student, as many of the generic skills being encouraged in the interpreting students for their interpreting practice, that is, listening skills, comprehension, summarizing, and particularly note-taking, would also be beneficial to college students. Another side benefit of using AudioNote and iPads would be the potential to reduce the amount of paper used to print handouts, creating a more sustainable educational environment.

However, after regular use throughout the semester, the CI students voiced quite contrary opinions with respect to the usability and feasibility of AudioNote for note-taking purposes. Issues that were raised regarding AudioNote included difficulty of typing, page turning, and retrieval of notes. On the general usability of the application, some students commented:

I would rather use a pen and paper since they save you heaps of time.

[There were] feasibility issues with note-taking and usability issues with the app design.

After the first meeting when students commented that they were not comfortable with typing notes while simultaneously interpreting, it was pointed out that AudioNote also has a handwriting function, where you can use your finger or a stylus pen to write notes. Nevertheless, they still found it difficult, as revealed in the comments below:

I found it a good application for recording, but it is not particularly useful for note-taking [...] because you have to type, instead of writing. Also for note-taking, most of us take notes in two

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different languages and occasionally in more languages, and this is a... particular...exclusion... And we also take notes in short forms, and we also write two words... and the autographic features of iPad make it very difficult.

I encountered the same [problem] as [student name] did. Because of the note-taking... I usually draw something, draw some symbol, and I don't know how to do that. And I have downloaded some application that we can actually do something, draw something and use that as a note-taking application.

Sometimes we tend to take our notes in Chinese characters; it is much more difficult to use AudioNote to write down Chinese characters.

One of the instructors felt differently:

I found that using finger is a lot better than pen, because I only take note of numbers and names [...] It facilitated my interpreting, particularly on numbers, so that proved to be rather helpful.

These comments illustrate that the major areas of concern among students were the speed, efficiency, and flexibility of using an iPad and AudioNote in place of traditional pen and paper for note-taking while interpreting. Bearing this in mind, as part of the scheduled teaching activities the instructors adapted the following (mainly consecutive) interpreting tasks, with an aim to further test the feasibility of using AudioNote for note-taking purposes. Students were given three interpreting tasks. Task A = segments of less than 1 minute; Task B = passages between 1 and 3 minutes long; and Task C = speeches running between 3 and 10 minutes. As mentioned previously in Section 2.3.1, note-taking is a cognitively demanding process that involves working memory, splitting of attention, writing notes, and the multiple coordination of those efforts (Gile, 1995, 2009). Therefore it is generally believed that the longer the passage and the more complex the genre, the more difficult it is for interpreters to take notes and interpret, as the cognitive efforts involved in each of the tasks inevitably aggregate.

From observing students' performances in the above tasks while using an iPad for note-taking, the instructors found that students found Task A relatively easy to handle, largely thanks to the interpreting skills they had already acquired. However, they found Tasks B and C quite challenging, primarily due to the cognitive efforts as mentioned above. From a skill acquisition perspective, the instructors considered these activities, used in combination with an iPad and an app like AudioNote, as being an effective approach for students to learn the specific skill of summarization, that is, giving time-constrained tasks forced students to focus on the meaning of an incoming message rather than the specific wording, and hence use their memory (and their note-taking to assist) in a more selective and skilful way. This observation was corroborated by one student when rating the application:

For short or simple materials, the handwriting function [in AudioNote] can be used to assist the interpreting process, but it is not that useful when it comes to longer and more difficult materials.

This view was also shared by the instructors, who, after evaluating the students' interpreting performance, concluded that it was most effective (from a skills transfer perspective) to use AudioNote for note-taking purposes to assist in interpreting passages that ran between 1 and 3 minutes. In sum, it was found that the use of AudioNote had limited benefit in note-taking for interpreting, and, contrary to expectation, was not as useful as initially envisaged for note-taking purposes; but it was useful to assist in general study.

Just one thing about the AudioNote, I find it a bit difficult for me to take notes, but I think it is useful for me like in other ways as after I review the recording by myself, I can take some notes about the recording. Because I am doing some research on summarization so in the process that I was listening to my recording, I can jot some notes about ideas, or sometimes tutors in class would

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like to mention some equivalents, or some English or Chinese expressions, so we can just note it down. I think that is very helpful for me from AudioNote.

One of the unexpected outcomes of the study was the overall perception of the benefit of using the iPad in interpreter education, as a consequence of all the other apps discovered.

4.2. *App, App, and Away*

By the nature of the research design and the regular meetings between students and instructors to discuss apps that were located, the participants engaged in a collaborative process of identifying suitable apps that would benefit interpreting students and instructors in their learning and teaching experience.

Of the numerous apps available through the Apple Store, approximately 40 were selected as being relevant to the students' study in general. Apps typically fell into one of three categories: (a) general study skills, (b) language enhancement, and (b) interpreting skills, with some of the apps allocated to more than one category. Table 1 gives a breakdown of the number of apps in each category, and Table 2 provides examples of some of the apps identified, how they were categorized, and a summary evaluation of the app.

Table 1: Number of applications by category

App Category (Code)	Number of Apps Identified
General study (a)	25
Language enhancement (b)	18
Interpreting (c)	18

Table 2: Examples of apps downloaded

App	App Store Category	Coding	Comments
Penultimate	Productivity	a, c	A good note-taking application for those who are comfortable with finger writing.
News Pro (and other similar)	News	a, b	A highly relevant app for general knowledge and language enhancement.
Longman dictionary (and other similar dictionaries)	Reference	a, b, c	A good reference tool covering the three areas under investigation.
Dropbox	Productivity	a, c	A very handy tool for online file sharing that benefits both general study and interpreting practice, and accessing files when at real interpreting assignments.
IMDB	Entertainment	a, b	A good reference to cultural related issues and contextual knowledge.

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Good Reader	Productivity	a, c	Highly recommended, compatible with various formats, quite a handy tool especially for everyday interpreting practice and study activities.
Instapaper	News	a, c	A good tool that can save online news contents for offline use.
British Accent (and other similar pronunciation tools)	Education	b, c	A useful tool for language enhancement.
You Dao Dictionary	Reference	a, b, c	A quite handy two-way dictionary plus some translation and encyclopedic functions, good for immediate reference while interpreting.
ABC iView	Entertainment	a, b,	A highly relevant app for current affairs, language enhancement, and particularly extra linguistic knowledge.
Chemistry Formulas (and other similar tools)	Education	a, b, c	A good tool for interpreting on highly technical subjects, its functions resembles partly that of You Dao Dictionary.
Sydney Morning Herald, The Australian (and other similar newspaper apps)	News	b, c	A good source of local, national as well as global news. Mainly for language enhancement and cultural understanding, etc.
Wangyi Public Lecture	Education	a, b, c	A good database covering many areas; lectures in English with Chinese subtitles, good for language enhancement, general/specialized knowledge, and interpreting practice.
Daedalus Touch	Productivity	a, c	Similar to Dropbox, and can synchronize with Dropbox, plus an email function.
Wordbook XL	Reference	a, b, c	Another useful reference tool with audio and lexicological functions, great for general users, language learners, and interpreters at training.
Flip Board	News	a, b,	A quick reference tool with customization function that is helpful in general study and English language enhancement.
Filemaker	Business	a	An outstanding data/project management tool that benefits both general and specialized users. Highly recommended.
Bento	Productivity	a	Like Filemaker, a highly inclusive but much more economical app that helps categorize data for users. Great research and data management tool.
Micro English	Education	a, b	A good tool for language enhancement, and possibly for general knowledge.
To do	Productivity	a	A convenient management tool for everyday tasks or files, like Bento.
My Environment	Reference	a, b,	A good reference tool for contextual knowledge.

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Dragon Dictation	Business	a, b	A good practice tool for both general study purposes and language enhancement, and possibly interpreting study as it helps improve short term memory.
Memo ++	Games: Arcade	b, c	An app that trains one's memory via games, and possibly facilitates one's language enhancement.
Better Brain	Health & Fitness	a, c	An app to exercise one's memory, esp. STM, which could be potentially conducive to interpreting study.

Once the students had coded the apps, it emerged that the students predominantly used apps to help them improve their general study skills. This implies that using iPads would add value to any college student for the purposes of developing generic skills. Nevertheless, it is evident from this study that the interpreting students particularly benefited from apps that could complement the development of their language competence and skills required for interpreting (such as memory). Thus, using the iPad enhanced development of their generic and domain-specific skills, as illustrated by the following student quotes:

I have downloaded another application called... the title is Interpreter's Wizard. It helps us to build up our glossaries.

You Dao Dictionary, you can not only look up the words; you can also use the functions of the encyclopedia, and you can translate the text as well.

I downloaded an application called Shakespeare. This is a free application with all of the complete works by Shakespeare, all the plays, 41 plays, 154 sonnets and 6 poems... So if you are a fan of Shakespeare, it is a good choice. Even [if] you are not, I think it is a good tool for learning.

...there is another one called Wisdom Quotes. It is about inspiring quotes from celebrities, or famous people all over the world such as Einstein, Aristotle... yeah, I think we are supposed to get ourselves more familiar with those quotes, especially by those celebrities all over the world, because it is very common and very possible that we would encounter this kind of sayings... and you can do keywords search on this application. It also provides images and links to the author's profile in Wikipedia. It is very handy.

I found this one, which is from a Chinese company. Its Chinese name is Wei Yingyu, and we can translate it literally as Micro English. It is very powerful, very interesting and very helpful. There are mainly three sections: words, sentences, and articles. In terms of words, you can get news words every day...with the latest, the most popular, most fashionable words. And for the sentence, the sentences section, which has a variation of Chinese texts and English texts... so if you scroll the Chinese text down, and then the English text will scroll down just automatically... yeah, it is very convenient... all kinds of... there are political, business articles, and economic [texts]... And also it is connected to the Chinese twitter so it is so easy to share with your friends if you come across anything.

I downloaded two applications; they are both fairy tales and released by one company, called Noisy Crow. It's very interesting that when you open the applications, and they tell you just stories when you are ready, and you can choose to use different accents, i.e. what do you prefer: do you prefer British accent or do you prefer American accent various kinds of accents. And you can press

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any buttons or any figures, and they are all animation figures, and I think it is quite helpful if some students want to practice fairy tale interpreting... so probably it is useful for beginners... particularly in the 1st semester... some students whose EVS [Ear-Voice-Span, timelag] are too long and they can practice these fairy tales.

Through the action research process, the instructors and students designed learning activities that utilized the apps in the classroom, which included the following:

- Instant research – glossaries, definitions, factual information
- Shadowing exercises
- Summarizing exercises
- Note-taking exercises
- Listening and comprehension exercises
- Memory exercises
- Interpreting practice
- Quizzes

For example, in one activity, students were instructed to take notes from speeches of various lengths, ranging from 3 minutes, up to 10 minutes, using AudioNote. Due to the constraints imposed by the app, which did not allow them to freely leverage their note-taking system with pen and paper, they had to rely on their memory more. With longer speeches (running 8–10 minutes), the students had to pay more attention to the key messages, the intention of the speakers and the structure of the speeches. In so doing, they were unconsciously persuaded into applying strategies such as chunking and summarization.

Thus it was found that using the iPad collaboratively could directly contribute to learning and teaching activities, and enhance the classroom experience. To refer back to Taylor's (2012) directive, we found that the students embraced the iPad technology, used the iPad innovatively to engage in the learning process, and worked collaboratively together to guide and be accountable for their own learning.

4.3. To iPad or Not to iPad?

In assessing the students' level of engagement with the iPad in relation to Bloom's Revised Taxonomy (Anderson et al., 2001), it can be seen that the students engaged with the iPad at all levels of learning behaviors (see Figure 1 above). They used various apps to assist with their memory (remember), their comprehension (understand), they applied their knowledge gleaned from using the apps in their interpreting tasks and also applied use of the apps in actual practice (apply); they analyzed and evaluated their generic and domain-specific skills using apps (analyze, evaluate), and they were directly involved in creating activities using the apps (create). Our study only scratched the surface in terms of apps that could be utilized on the iPad, so we recommend readers to a Web site built by Kathy Schrock (www.schrockguide.net/bloomin-apps.html), which outlines different apps that can be used to support students in developing generic skills and the different learning behaviors outlined in Bloom's Revised Taxonomy. Figure 2 below, a screen-grab from the Web site, provides an example.

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Figure 2: Screen-grab of Bloomin Apps



In conducting an overall evaluation of use of the iPad using the Emerging Technology Evaluation Framework, it was generally perceived by all participants that the iPad could be used as a tool to augment the learning and teaching experience for all college students. A summary of the evaluation of the iPad in terms of application of emerging technology features can be seen in Table 3.

Table 3: Overall evaluation of the iPad

	Highly Satisfied	Satisfied	Unsatisfied	Highly Unsatisfied
Access	X			
Ease-of- use	X			
Reliability	X			
Speed & connectivity		X		
Screen layout	X			

The major reason for slightly less satisfaction in relation to speed and connectivity is that students were provided with iPads that were only WiFi enabled (i.e., did not have 3G sim cards), so they could only access the Internet when on the university campus or at home. Apart from that, from the students' perspective, the iPad was

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deemed as a very useful and helpful study tool, acting as a platform for searching, retrieving, compiling, and transferring information:

Having an iPad is very useful, so we can click on the link, and listen to the videos from the class or something else, or do some research.

It (iPad) is very useful for our study and general language enhancement... and at present this is the most effective method.

The instructors agreed that there were tangible benefits to using the iPad in classroom, as noted by the course coordinator:

I believe that just the fact that each of us has an iPad in our possession is very helpful throughout the whole semester, because I found it very easy. Apart from saving a few trees and I think probably it is easier for you to use the links that I gave to you, particularly in this environment, or on campus as a whole, because it is quite easy for you to have access to all the links.

However, it did take some students a while to get used to the iPad:

I think it can be very useful but that is something we have to train ourselves first to fully utilize the effectiveness, and... I think that defeats the purpose of having an iPad to help us in the first place."

"It took a while before students who had never used an iPad to familiarize themselves with the UI (user interface) and OS (operating system).

And others recommended that although it was useful and beneficial, it was not enough on its own:

Overall, the iPad provides an enjoyable study experience to the students. The app store is full of useful software; the built-in YouTube is a blessing. However, I do not suggest to completely rely on the iPad for educational purposes... The iPad may save some paper money, however, [sometimes] I found it more convenient to use the traditional note-taking method.

From the above comments it can be concluded that despite the overall positive user experience among students, some effort is needed to help students maximize the benefit of using an iPad in their everyday study.

5. Conclusion and Recommendations

In our study, we implemented a participatory action research process to introduce an innovative use of emerging technology into the interpreting classroom, and the students were able to engage in self-directed and collaborative learning—a form of ‘student-centered e-learning’ (Motschnig-Pitrik & Holzinger, 2002). This educational-research approach enabled us to utilize “pedagogy for today’s learners” as outlined by Mark Taylor in this issue of IJIE to:

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- improve student's future orientation;
- identify class goals/link to student goals;
- improve student understanding of class expectations;
- move the content learning out of class;
- create the necessity of preparing for, and attending, class;
- increase classroom activity and engagement; and
- improve assessments and accountability.

The findings reveal that the iPad, the AudioNote app, and many other apps are significant learning tools that enhance the development of both generic and domain-specific skills for Conference Interpreting students and instructors. We believe that the iPad could be used in a similar fashion for interpreting students of any language combination, in spoken and signed language interpreter education programs; and also for any college student to develop their generic and domain-specific skills.

5.1. Recommendations

The outcomes of this project have led us to make several recommendations in relation to educational research and the introduction of iPads in interpreting classrooms.

5.1.1 Educational Research

In the original project plan, the instructors and students were to engage in the action research process for the full academic year (i.e., two semesters). However, due to delays in securing the grant funds and purchasing the iPads, we were only able to collaborate with the students over one semester, which was actually the second semester of study in the Conference Interpreting program. Therefore we believe that the students' reluctance to use the AudioNote for note-taking was partly due to the fact that, skills wise, the students had already established their own note-taking system in the first semester of study. Due to the cognitive load associated with note-taking in consecutive interpreting (see Section 2.3.1), it is not surprising that students would be resistant to trying a new system when they were already halfway through their program. We recommend that future action research studies on innovative utilization of technology take place over at least 1 academic year in order to comprehensively test and evaluate the technology in question. Likewise, we suggest that such a research study occur in tandem with the commencement of a college program, so that students can engage in the action research cycle as soon as they begin their studies.

5.1.2 Introduction of iPads

The introduction of iPads into interpreter education programs should be carefully planned. Feedback from students in our study revealed that some of them needed time to familiarize themselves with the iPad interface and features. For this reason, where possible, crash courses or workshops should be organized for students and instructors together, where everybody can learn how to use the iPad in a more systematic way to boost the efficiency and effectiveness of using the technology to enhance their learning experience.

Furthermore, interpreter educators can use the collaborative process outlined in this article to similarly engage students in self-directed learning in order to identify how to best utilize the iPad for generic and domain-specific study purposes, and to locate suitable apps to be used. In fact, we suggest that educators develop a suite of appropriate apps that cater to the learning and teaching needs of interpreting students in line with the curriculum in question, and recommend these to students at the beginning of their college study, so that the iPad's benefits can be maximized in relation to general study skills, language development, and interpreting skills development.

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Acknowledgments

This project was made possible through a Macquarie University Emerging Technology Grant. We would like to acknowledge Marina Harvey in the Macquarie University Learning & Teaching Centre (LTC) for her idea to apply for the grant for this project, and Maree Gosper (also from LTC) for her suggestions in developing the project proposal. We would particularly like to thank all the Macquarie University Masters of Conference Interpreting students from 2011 for their enthusiastic participation in this project; and finally, we would like to recognize Suzanne Ehrlich for her suggestion regarding websites linking Bloom's Revised Taxonomy to iPad apps.

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Appendix

Evaluation of Emerging Technology Project

Master of Conference Interpreting students & iPads

Software Capability Analysis

To be completed after the trial

1. Rate your overall satisfaction with the iPad and related applications - Highly satisfactory to highly unsatisfactory. Please add comment where appropriate

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	H Sat	Sat	Unsat	HUnsat	Comments
Access					
Ease-of- use					
Reliability					
Speed & connectivity					
Screen layout					

2. Which features of the iPad and applications did you use – rate your level of satisfaction and provide explanatory comments where appropriate (Highly satisfactory – highly unsatisfactory)

	H Sat	Sat	Unsat	H Unsat	Comment
AudioNote					
Other applications					
Email					
YouTube					
Notes					
File sharing					
iTunes					
Other					

3. What difficulties or challenges did you or your students face? How did you resolve these?

4. If used for assessment, please note any issues or difficulties you encountered. How did you resolve these?

Effectiveness in meeting needs

5. Overall was the iPad effective in being able to support the teaching and learning activities you identified?

6. Were there things the iPad couldn't do?

7. Do you have any teaching/studying tips and /or advice you would like to pass on?

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Environmental Impact Analysis

To be completed after the trial

Support and training

1. Please list any particular teaching, learning or technical skills required to use the iPad effectively.

2. Were there any issues that arose in relation to quality assurance and compliance with regulatory frameworks? Comment as necessary.

students with disabilities

information management

confidentiality

Intellectual property

copyright etc.

quality assurance

privacy and confidentiality

other

3. Rate your level of satisfaction with the training and support provided.

	H Sat	Sat	Unsat	H Unsat	Comments
Staff Training / documentation					
Student Training / documentation					

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Support for staff					
Support for students					

4. After the initial set-up period, how would you rate the ongoing workload implications associated with the normal teaching and learning processes: (highly manageable to highly unmanageable)

	HMan	Man	Unman	HUman	Comments
Organising & setting up sessions					
Preparing materials					
Running the sessions					
Post session tasks					
Supporting students					
Other					

5. Were there financial costs associated with using the software for teachers and/or students? Please identify these and comment on whether you consider them sustainable

6. What were the risks associated with using the iPad and related applications and how did you manage those risks?

7. Overall, satisfaction with and sustainability of the iPad and related applications:

- Would you use the software again for similar purposes?

- Are there more effective and efficient ways of undertaking the activities, etc., and achieving the same outcomes?

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8. What other uses can you see for the software in all areas of your study/teaching?

9. Would you recommend the software to your colleagues/fellow students - and what conditions would you place on its use?

10. If this type of software was not available to you and your colleagues in the future, what do you see as the possible implications?

11. Are there other issues or comments you would like to make about the software?