Mobile-Assisted Language Learning: Designing for Your Students

Agnieszka Palalas*

Abstract

Mobile-assisted language learning (MALL) can augment second language teaching and learning by taking it into the real world. Authentic communicative situations in conjunction with the cultural artefacts and metalinguistic clues offered by the context can promote active learning; however, as respondents of the study presented in this chapter observed, this dynamic process of situated learning has to be supported by access to peers and facilitators, information and linguistic resources, as well as tools for capturing and distributing linguistic information. Moreover, out-of-class language learning has to be guided by a relevant pedagogical task which encompasses language-in-action activities and motivates students to work and communicate with others. When interacting with others in a socio-cultural milieu of the real world, students can rely on mobile technology to provide the necessary cultural artefacts and tools. This chapter reports on a design-based research (DBR) study seeking to enhance English as second language (ESL) students' aural skills with help of mobile devices. Owing to the comprehensive feedback from an interdisciplinary group of students, the design of our MALL solution has evolved from a set of podcasts to a suite of learning tools which enable access to a networked community of practice and other resources required for the completion of language tasks.

Keywords: mobile-assisted language learning (MALL), real-life language tasks, learner-generated content, MALL instructional design, design-based research (DBR).

*George Brown College, Toronto, Canada; Doctoral Candidate, Athabasca University, Canada. e-mail: agaizabella@rogers.com

How to cite this chapter: Palalas, A. (2011). Mobile-assisted language learning: designing for your students. In S. Thouësny & L. Bradley (Eds.), *Second language teaching and learning with technology: views of emergent researchers* (pp. 71-94). Dublin: Research-publishing.net.

1. Introduction

This chapter reports on how the conceptualisation of mobile-assisted language learning design was refined through the enhanced understanding of the needs of students and their specific context. It aims to demonstrate how students' feedback gathered through multiple stages of collaborative inquiry, coupled with the expertise of practitioners and the knowledge derived from research, theory and best practices, engendered a new conceptual approach to the design of mobile second language instruction. Initiated by L2* students' demands for innovative English for special purposes (ESP) instruction, which would allow them to learn English out-of-class in their own time, this investigation into effective MALL solutions has progressed from an exploratory study (Palalas, 2009) to a longitudinal design-based research project. The first two phases of the ongoing DBR study and the resultant findings are the focus of this chapter. The DBR investigation drew on what had been learned in the earlier exploratory research project, a brief synopsis of which is presented below.

The exploratory study commenced at George Brown College (GBC) in Toronto, Canada, in 2007. It sought to augment classroom learning by designing MALL solutions which would promote out-of-class listening practice, thus offering added language learning without increasing classroom time. The resulting mobile learning tasks were then tested as part of a hybrid ESP course. This English for Accounting course aimed to optimise L2 students' academic success at the college and consequently to help them secure jobs commensurate with their qualifications. Its curriculum blended in-class, online and mobile learning to address both the language and socio-cultural competencies required by the Canadian workplace.

Building on the inherent affordances of the iPod Touch, which was the main technology under study**, audio and video podcasts were created in-house for on-the-go access. Other open access ESL podcasts and vodcasts were also available to

* L1: speakers of English as their first language; L2: speakers of English as their second language.

** iPod Touch devices were loaned to students for the period of the exploratory study; one student chose to use her own mobile phone instead.

students for flexible retrieval. These included selected ESLpod, Business English Pod, and TED videos as well as Whaddaya Say audio recordings. Additionally, students were encouraged to use their handheld devices to communicate by blogging and via email, as well as to record their written reflections using the Notes feature. Nonetheless, to curtail the difficulties resulting from typing using small keyboards and the cost of connectivity (Kukulska-Hulme & Shield, 2008), the mobile devices were used primarily for the provision of pre-loaded listening and video content. This MALL approach was tested in a fifteen-week pilot which concluded in August 2009.

During the pilot-course, feedback pertaining to the effectiveness of the MALL activities and student satisfaction was collected from twelve L2 students and four practitioners. Using qualitative and quantitative measures, this exploratory study also examined students' learning and took a closer look at what types of activities students preferred to engage in and why. While participants expressed high levels of satisfaction with the MALL component of the course, it was found that the mobile devices were used primarily as media players. Minimal levels of interaction were observed and the connectivity features of the mobile devices were hardly utilised. Learning was thus limited to non-reciprocal listening and rote memorisation of vocabulary. It became evident that the instruction had to be modified in order to promote effective second language learning, encompassing communication and benefiting from the inherent capabilities of mobile devices. In addition, a number of mobile learning advantages and caveats were identified which provided a better understanding of students' experience with mobile technologies. Consistent with mobile learning literature (Kukulska-Hulme, 2005; Kukulska-Hulme & Pettit, 2009; Kukulska-Hulme & Shield, 2008; Naismith, Lonsdale, Vavoula, & Sharples, 2004; Pachler, 2009; Sharples, 2009), students cited flexibility, portability, access to resources and convenience as the key benefits of mobile learning, whereas cost and limited connectivity were identified as its primary shortcomings. Informed by these findings and the latest mobile learning research, the question of effective MALL design was revisited in a new DBR study which commenced in September 2009. The next section introduces the current study.

2. Investigating effective MALL design: design-based research

As mentioned in the introduction, the current DBR study draws on the findings of a two-year investigation of MALL solutions addressing the development of aural skills in adult college students. The main purpose of the study is to distil a set of design principles for effective mobile-assisted listening learning objects (LO). The main question guiding this investigation is:

> What are the characteristics of an effective pedagogically sound LO for students' mobile devices through which adult ESP students in a community college enhance their listening skills while expanding their learning outside of the classroom?

The primary focus of the question rests on what constitutes an effective pedagogically sound MALL resource. The investigation into the vital elements of a successful design involves multiple iterative cycles of the LO design, development, and evaluation. Therefore, supplementary research questions congruent with the various phases of the study have emerged and will continue surfacing in the process to guide the ongoing inquiry. This chapter concentrates on the informed exploration and enactment phases, which are the first two stages of the four-phase study. Throughout the multiple cycles of those two phases, a number of questions were asked of the research participants as they were creating and testing the subsequent versions of MALL listening learning objects. The two key questions pertaining to the effectiveness of mobile learning activities and the affordances of mobile technologies were:

> 1. Based on the MALL resources you tested and other m-learning ESP materials, what are the characteristics of effective listening activities/ resources for mobile devices?
>
> 2. How do you usually use your mobile device for learning, work, and leisure? Which of these uses should be adopted in the design of MALL listening activities/resources?

To distil the vital characteristics and understand their relationships necessitates interdisciplinary feedback from L2 students, designers, programmers, English as second language practitioners and m-learning researchers. Moreover, such feedback has to reflect the specific needs of the George Brown College L2 students and their educational, linguistic and cultural context. That context and more importantly student voices have shaped the design of the preliminary MALL LOs as well as the theoretical framework adopted by the study. The remainder of this chapter discusses the evolving conceptual framework of the DBR study, the findings of the two completed stages and how they have informed future research at GBC.

2.1. Theoretical framework

To ensure pedagogically sound design of mobile listening activities, sociocultural theory (SCT) was initially adopted as the framework for the study. Vygotsky-inspired sociocultural theories share the concept of higher-order cognitive functions being culturally mediated and communicative processes as "inherently cognitive processes […] indivisible from humanistic issues of self-efficacy, agency, and the capacity to lead a satisfying if not fulfilling life" (Thorne, 2005, p. 403). Accordingly, social interaction and the internal cognitive process of thinking are strongly interconnected in "a dialectic unity in which publicly derived speech completes privately initiated thought" (Lantolf, 2000, p. 6). The activity of mind cannot be realised without interaction with others through culturally organised activity. Hence, social relationships and culturally constructed forms of mediation play a central role in human cognition (Lantolf, 2000, 2004). For learning to occur, recurring interaction with the cultural-historical context and other people is sine qua non. All interaction and communication with others and the world is thus mediated by culturally constructed artefacts including language and technology (Lantolf, 2000, 2004; Pachler, 2009). Users see those cultural artefacts as meditational means for "interpersonal (social interaction) and intrapersonal (thinking) purposes" (Lantolf, 2000, p. 6) and tools that serve a specific purpose (Thorne, 2005). Furthermore, as learners develop, they gain increasing control over those tools (Lantolf, 2000) and as a result develop their communicative skills.

As indicated above, SCT integrated the constructivist concepts of mediation, goal-oriented activity, the zone of proximal development (ZPD) (Vygotsky, 1978), and interaction with others in a socio-cultural milieu. In the MALL context, this translates to designing instruction which promotes communication with others in a relevant setting, through goal-oriented activities. It calls for an inclusion of collaborative communicative activities mediated by the mobile technology across time and space to accommodate cognitive and social processes. While learning language in action, learners need access to others as well as to information, feedback, and help systems which can be provided through the appropriate software (Hoven, 1999). For the learner to achieve independent performance, interactivity should be combined with the scaffolding support of facilitators and peers (Vygotsky, 1978) or appropriate forms of computerised context-sensitive help.

Mobile technologies do, indeed, facilitate the support of a networked community of practice and learning situated in the real-life setting. Using handheld devices learners can engage in interaction not only with others, but also with their environment (Sharples, Taylor, & Vavoula, 2007). The context of learning is thus a significant construct which embraces the environment in which learners operate, with all its inherent components and actors.

The two context-related perspectives on mobile learning adopted in the study are: context-independent learning when the learner is using travelling or dead time to learn using mobile devices, and context-aware (contextual) mobile learning when the learning activity relates to the location (physical, geographical or logical) of the actors and the context in which they are moving (David, Yin, & Chalon, 2009). It is the latter perspective that had been identified in the exploratory study at GBC as a critical element of engaging communicative MALL activities. Consequently, the current theoretical framework also integrates the notion of situated learning with its emphasis on the authentic context and social interaction (Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991) as well as "apprenticeship" learning based on "activity in and with the world" (Lave & Wenger, 1991, p. 33). Seen through this conceptual lens, MALL can be defined as language learning enabled by the mobility of the learner and

location, portability of handheld devices (Kukulska-Hulme, 2005; Mwanza-Simwami, 2009; Naismith et al., 2004), human interaction across multiple situations mediated by mobile technology within a networked community of practice (Sharples et al., 2007), embedded in contexts which are relevant and pedagogically sound (Laurillard, 2007) and informed by the real-life context in which the learning takes place.

2.2. Method

It is the intent of this DBR study to produce two key outputs which Plomp (2009) refers to as educational interventions and design principles (intervention theory). The combination of two parallel goals, namely, the design of MALL learning solutions and the development of a corresponding instructional design (ID) framework, makes design-based research a suitable approach for the purpose of this real-world practice study (Brown, 1992; Plomp, 2009). Interventionist and practical in nature, DBR is "a systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories" (Wang & Hannafin, 2005, p. 7).

To ensure "rigorous, research-based cycles within a technology-based instructional design effort" (Bannan, 2009, p. 53), the integrative learning design framework (ILDF) (Bannan, 2009) has been adopted. The ILDF model encompasses four phases of (1) informed exploration, (2) enactment (3) evaluation: local impact, and (4) evaluation: broader impact. These phases and their cycles are, in fact, iterative and they tend to overlap. The first two phases have been completed and they are summarised below.

2.2.1. The informed exploration phase

To better understand the ESP student needs, informed exploration focused on comprehensive investigation of the target audience and practitioners' perceptions. Data collected in the exploratory study were revisited and enriched

with additional comments from both returning and new research participants, all of a diverse cultural and demographic backgrounds. These included twenty-one adult L2 learners, eleven of whom were from the original Accounting pilot-course, six from the School of Design, and four were Programming students from the School of Technology. Practitioner perspective was represented by two Design faculty, two Programming faculty, and three Communications/ESL professors. Qualitative feedback was collected from all participants via three semi-structured focus groups with the three individual groups of students and five faculty meetings supplemented with email communication. In addition, an online survey was conducted with a random sample of 182 L2 George Brown students regarding the type of mobile devices they use, how and when respondents use them, as well as data plans they subscribe to. The data gathered from this interdisciplinary group was then coded, interceded, and analysed for the most frequent themes using the NVivo software. The results highlighted the systemic social, cultural, and organisational influences and constraints on the MALL intervention design. These findings coupled with comprehensive review of relevant literature on second language learning, mobile learning and instructional design, resulted in a theoretical construct of the MALL listening LO, which has served in the subsequent stages as an ideal providing "a vision and a guide as well as a significant component of the measuring stick by which the ideal, as instantiated in actions within a real context, is measured" (Anderson, 2007, slide 48). The prototype of this ideal was produced in the next phase which is discussed below.

2.2.2. The enactment phase

In this highly visible production phase (Anderson, 2007), prototype MALL listening learning objects were designed and developed by the researcher in cooperation with the School of Design and School of Technology students and practitioners. First, twelve post-graduate Design students, including six L2 speakers, completed the design of MALL learning objects as part of their course curriculum. They had access to an ESL instructional designer through ten weekly in-class meetings. Design students' feedback was collected through those meetings, two focus groups, and email correspondence. Their creations

were then handed over to a group of two L1 and two L2 programmers who, through multiple cycles of redesign, development and prototype testing, further enhanced the perspective on the MALL design. Having faced multiple stumbling blocks in terms of the conceptual framework as well as technology, the interdisciplinary team of students and practitioners collaborated on the design through weekly face-to-face meetings, online Elluminate* sessions, as well as email and wiki communication. Design, Programming and ESP students created a strong network through which they have also exchanged their expertise and feedback with the researcher and the faculty. They engaged in the systematic adaptive work of sharing the learning through formal and informal collaborative practices including planning, researching, problem solving as well as individual and collective ID tasks.

While the students documented the design and development process through their assignments and design logs, their feedback was recorded by way of researcher notes and audio recordings from the face-to-face and virtual Elluminate meetings. The data collected from all students and practitioners was once again coded and analysed using NVivo. Its main themes constituted the basis for the refined conceptual model which is presented in the findings and discussion sections.

2.2.3. Findings

The informed exploration and enactment phases of the study produced contextually-grounded knowledge based on the interdisciplinary feedback collected from language learners, student designers and student programmers as well as practitioners. It is primarily the student perspective, however, and the investigation of their "mobile habits" that triggered the re-conceptualisation of the design approach. These findings are presented below using selected verbatim quotes from research participants. They have been arranged to tell the story with students' words and to encapsulate the main themes of the feedback obtained from the L2 learners.

* Elluminate Live! is a web conferencing program; it offers an array of communication and presentation tools. It was used in the study for the purpose of synchronous online meetings with practitioners.

As mentioned before, student participants were asked two key questions; the first one aimed to identify the main characteristics of effective listening activities/ resources for mobile devices. The following responses are representative of all L2 students' opinions pertaining to the first question:

> *All that helps you practice how to understand other students and other people not only at school.*

> *Most important characteristic is that we can listen when we are not busy and we can practice pronunciation and vocabulary.*

> *I like the videos from work that show the culture office behaviours. I think that this is important to learn about what's important at work and also new things to immigrants… and to listen to accounting vocabulary.*

> *I really like the podcasts that I can listen to when I'm on the TTC [Toronto Transit Commission] but sometimes I catch myself that I stop to listen and to concentrate. I also stop when I'm not sure what it means. So it's better if I could ask about the meaning when I listen instead of to wait when I meet my friends… When we meet with the teacher she can help us or other students can help me… maybe we could [get help] over the phone.*

> *When we work with our mobile phones we are isolated, like I am isolated when I am in the Accounting courses because my English is not so good; but when we meet once a week and do team assignments, we feel part of the group… I don't know if that can be done through the phone, but belonging is very important.*

> *Sometimes the mobile learning does not keep me interested because it's like listening to the radio, you can stop if you want to or if you are tired. When we are in the ESL class the teacher forces us to get up and do things. Something like that is needed on the phone.*

The best assignment was when we had to prepare radio interview. First I was very nervous but then we ensured that it was interesting to us and to the class. The recording directions were not clear but we figured it out…the most important characteristics are clear directions, real problems connected to our program, and examples from other students...you are proud when you create your own project, many students are creative, and I enjoyed to listen to their programs.

Some of the tasks should be more demanding… more like real case studies not ESL exercises.

… works for me but I'm not sure about everybody; we all should talk for ourselves.

Students further elaborated on the salient functionalities of handheld devices in their comments to the second question: how do you usually use your mobile device for learning, work, and leisure? Which of these uses should be adopted in the design of MALL listening activities/resources?

I use my phone usually for to text and call my friends. I also check my email and Facebook… I don't have the Internet but it would be good to help with my homework.

Like everybody, I communicate with my friends and classmates, also [colleagues] at work, both for leisure and work; we communicate for fun and to get things done.

Listening to music is for pleasure, but I listen also to radio, some podcasts [the teacher suggested] and other that my classmates found.

People can learn from TED, YouTube and special websites for different topics.

… other students said to me to use YouTube and iTunes but I don't know yet.

You find information from Wikipedia, or answers.com, or use audio Google app.

I have dictionary and apps that you can practice words… flash cards that with audio would be better.

For help with English, I use my dictionary or there are translators for iPhone.

Audio dictionary? I didn't know… then you can check a word when I don't know what people say to me.

Usually, I make photos with my phone to send to my friends, but you can use pictures when don't know the word and you want to explain something, or for you to ask someone later.

When we did interviews for our radio, different students used different recorders. It depends on what you can afford. The teacher put us in groups so we had all tools we need for the assignment.

You can use what you have on your phone, you can listen or type, you can learn or have fun… it's your choice.

I cannot do the same like other students because they have more expensive phones.

To help you learn you can ask teacher for lesson podcasts.

For media, I normally send my favourite pictures and songs, and I listen to songs;… I take photographs and send to show what I like… but maybe we can listen to other people favourite songs and talk about them.

Students identified a number of interconnected components of a potential MALL solution and their properties. Before I propose how to incorporate all of them into a new design framework, the abovementioned results are summarised and their pedagogical implications are discussed.

3. Discussion: implications for the MALL design

Learners' needs have to be integrated in the design of any student-centered instruction. Our L2 students emphasised that it is the key goal of language learning to be able to communicate in any life situation as part of a community. In fact, it is the very purpose of learning to be "prepared to deal with novel contexts that are going to be encountered beyond the classroom" (Larsen-Freeman, 2002, p. 43), and mobile technology affords learning out-of-class and thus engenders situated practice and flexible learning across space, time, and contexts (Sharples, 2009).

Consistent with earlier findings (Palalas, 2009), GBC students valued out-of-class ESP practice and the opportunity to learn in their own time. In their language practice learners wanted to focus on listening comprehension, advanced vocabulary, field-specific terminology, pronunciation, and socio-cultural competencies. A majority of respondents also emphasised a need for activities which would engage and motivate them despite the physical absence of such extrinsic factors as the facilitator or peers. The pilot course students had indicated that the hybrid course sustained their high levels of motivation primarily on account of the weekly face-to-face meetings and the feeling of belonging to the community of practice which they had not experienced in other college courses. Due to what the learners themselves considered as their inadequate language skills, their learning was hindered by affective barriers and the feeling of being emotionally and socially distant from their peers. Subsequently, some respondents elaborated on the notion of community of practice and a need for technology-enabled opportunities in order to socialise. Socialisation with peers indeed promotes language acquisition (Kramsch, 2002). Apart from the emotional and social aspects

of interaction, the significance of learning support available via the network was also accentuated. Hence, to maintain high levels of engagement and to provide both on-demand and delayed help, mobile students have to be able to seamlessly connect to their peers and facilitators. A number of web-based and phone-based digital resources can provide language help; however, the facility to interact with the community of practice is deemed particularly vital to m-learning. Lacking the physical proximity, mobile learners could, in fact, benefit from collaborative activities integrating communication via mobile devices in conjunction with in-person meetings at the participants' convenience. Consequently, collaborative tasks organised around joint goals form the focus of our MALL design.

In terms of other means of just-in-time learning help, dictionaries, glossaries and digital translators are used by L2 students to support communication and repair miscommunication. Additionally, learners resort to visual artefacts, such as photos taken with their phone cameras or images which can be accessed through their mobile devices. Students select these resources based on their needs and the technology available to them. As mature students and experienced language learners, many of our respondents indicated readiness to select from the tools, applications, and resources available on their mobile device. They recommended searching audio and video distribution portals such as YouTube, TED and iTunesU for existing podcasts and mini-ESL lessons. Students also identified audio flashcards and audio podcasts related to their personal interests as useful for language practice. While our learners autonomously explored a variety of MALL resources, they expressed a need for guidance through the vast amount of information, and wished for learning activities and materials to be organised around pedagogical tasks. Accordingly, it is essential to provide learning and technology help options which encompass access to peers and experts, language task-specific help, and a selection of web-based or locally residing language resources for mobile devices. Scaffolding derived from communication with others as well as mobile access to a choice of resources are critical; however, the facilitator should relinquish some of the control and empower the learners to accept more responsibility for learning (King, 1993).

All in all, the ability to access appropriate authentic materials and reference sources, to be guided by well-designed tasks relevant to students' interests, and to actively engage in synchronous and asynchronous communication with "connected" others have been identified as indispensable properties of the MALL design. Leveraged by mobile technology, the flexibility of interaction and expression within a web of learning can be further enhanced using various modalities and tools of choice. As indicated by our respondents, students record their own notes in text and audio, they take photos, they enjoy recording and uploading interviews, and they recommend creating and publishing mini-presentations using their mobile devices. Equipped with audio, video, and text capabilities, mobile devices afford communication through multiple means of representation. This allows for listening competencies to be taught in a more authentic environment integrating all four language skills (Rost, 2002).

Another concept interwoven throughout the learner feedback was that of student-generated materials. Respondents took pride in their creations and were willing to share their artefacts with others. As noted by McGarr (2009), when challenged to create their own materials, students have to engage their critical thinking and comprehend the content thoroughly. McGarr (2009) posits that "student generated content can also facilitate peer learning and contribute to a supportive and constructive [learning] environment" (p. 317). Therefore, drawing on constructionist theories, our MALL activities encourage learners to create tangible meaningful artefacts and thus enhance the learning experience (Ackermann, 2002). Students' engagement in meaning-making while designing relevant projects and sharing them within the community will facilitate their learning (Papert & Harel, 1991).

As mentioned above in the theoretical framework discussion, in order for that learning to occur, communicative activities should be embedded in real-life settings. Context, along with technologies and other cultural artefacts mediate meaning-making. Students reported, for example, informally utilising context to convey meaning when they snapped photographs of items they wanted to communicate about with interlocutors. Apart from capturing images and

symbols, language learners can benefit from a wealth of visual and audio clues surrounding them in an authentic communicative situations. Language in-action is emergent and dynamic (Lafford, 2009; Van Lier, 2000). "Language use is contingent on the communicative needs of the participants in particular speech situations—in particular, times and places (Lafford, 2009, p. 675). Language practice should, indeed, incorporate opportunities for impromptu revision and adjustment of speech when language "emerg[es] from a person's situatedness or participation in a physical and social world" (Kramsch, 2002, p. 11). "The environment provides a 'semiotic budget' […] within which the active learner engages in meaning-making activities together with others who may be more, equally, or less competent in linguistic terms" (Van Lier, 2000, p. 252). Overall, context affords meaningful interaction through an array of supports and cultural artefacts mediating communication. The GBC second language learners are surrounded by authentic language in-action at the College, at their workplace, and in the streets of Toronto. It is, thus, viable and beneficial to these learners to participate in MALL activities involving communication in these real-life contexts.

To sum up the main characteristics of our MALL instructional design, we seek to promote collaborative active learning situated in the real-world environment. MALL activities are built to allow interaction, communication, access to resources and people within the networked community of practice. The LOs are designed with respect to the technologies students have access to and to their preferences. Therefore, our MALL design promotes a collaborative approach which allows learners to combine various facilities and channels of communication that their diverse mobile devices afford.

Examples of MALL tasks based on the findings of our study include, among others, student-generated audio-visual descriptions of Toronto landmarks, an audio repository of English idioms, an audio dictionary, phone blogging, a Toronto scavenger hunt and radio interviews conducted by students. The pedagogical tasks entail listening comprehension practice, following audio instructions, in-situ communication, audio data collection, collaborative inquiry, multimedia artefacts creation and distribution, as

well as peer review of student-generated content. Students work with audio and video recordings simulating real-life communication in an authentic workplace as well as language examples and themes obtained from their college program courses. Moreover, students are required to communicate with their peers and other people either through rehearsed audio recordings or in impromptu speech situations, such as when faced by a scavenger hunt challenge or a phone inquiry. The majority of tasks involve listening comprehension practice, followed by recording of audio files which capture the usage of English in the real world. These steps are completed either individually or collaboratively, depending on the task. Subsequently, the student-generated artefacts are exchanged and peer-evaluated. To provide further opportunities for interaction, students are also encouraged to complete their tasks, and in particular the scavenger hunt and the Toronto landmarks challenges, either in a group or in pairs. Varied degrees of teacher scaffolding and mediation are required and can be provided in person, via email or by telephone. The type and timing of the expert support and coordination will be further investigated in the subsequent stages of the study; so will the balance between the flexibility of individual work vis-à-vis the benefits of collaborative activities.

The above-mentioned mobile learning activities are integrated into a complete MALL LO solution which provides a conceptual model for subsequent designs and their refinement. This MALL learning suite incorporates the following tools and resources, all of which can be downloaded onto the mobile device or be retrieved directly from the web-based mobile site:

- task-specific directions and resources: audio podcasts and related text-based materials;

- a selection of device-specific applications or web-based tools for creation of multi-media artefacts, e.g., audio recorders, ipadio software;

- information pertaining to the use of built-in CMC tools (audio podcasts and scripts);

- information regarding the pedagogical approach and proven language learning strategies, partially student-generated (audio podcasts and scripts);
- help options including communication with the facilitator and peers, FAQ site and a Wordpress class blog;
- proven linguistic references and language resources, including free software and applications deemed by respondents as affordable;
- uploading and publishing tools for student-generated artefacts;
- viewing options for collaboratively created databases and their constituent items;
- repository of students' questions and impromptu reflections;
- summative evaluation of all the constituent parts of the suite (text-based survey).

All the above components are interconnected to form a network of actors, tools, information sources, affordances and student-generated artefacts which enable out-of-class learning embedded in the real-life environment. Students can access information and co-construct knowledge by entering the MALL network through the devices of their choosing at a convenient time. While guided through the pedagogical tasks, the learner has a choice of what tools and resources to select.

Using an ecological metaphor, which has been proposed for the future phases of the study (Hoven & Palalas, in press), it is likely that some elements of our MALL system will not be used by some students, but they have to be available as potential affordances or pointers to affordances. The essential components of the MALL eco-system have been combined into one whole solution, more specifically the MALL suite, which functions through the interconnections of its constituents. The properties of any of the elements

of the whole solution can be investigated and understood only in terms of their interactions with the learner. Thus, our students are the critical link in the web. It is through the observation of their activity and the dynamic process of learning espoused by the MALL solution that the study will seek to determine the optimal instructional design for acquiring ESP aural skills.

4. Conclusion and future research

In this chapter, I have demonstrated how student feedback stimulated collaborative investigation into MALL instruction and the evolution of its design. From an m-learning language solution which relied primarily on audio and video podcasts, our MALL design evolved to offer flexible language learning which has a potential of being interactive, engaging, authentic, contextualised, connected and supported by appropriate feedback and scaffolding.

Owing to the interdisciplinary character of the DBR study and the opportunity to iteratively validate our design with college "language learners as language users in natural environments" (Kramsch, 2002, p. xi), the project has been able to generate a student-centered learning solution. In the resultant model of mobile-assisted language learning, the learner is viewed as a negotiator of contextual meaning and the ways to arrive at that meaning. He/she can select from affordances offered by the context, including mobile technologies and other cultural tools required to mediate the meaning.

As members of the community of practice, students collaboratively construct an ecological environment within which they interact, socialise, help each other and thus learn. Synonymously to the view of language as an open system (Larsen-Freeman, 2002), our MALL suite is seen as a system which can evolve in an "organic" process of learning. Learners generate artefacts and events which in turn inform and thus expand the MALL suite. At the same time, the system has to be flexible enough to be adaptable and transferable from context to context and from learner to learner.

What elements of the system are vital and what are their relationships? The design of those essential components and how they connect and inform each other will be investigated in the ongoing research. Other central questions necessitate further exploration and predominantly those pertaining to (1) how dynamic communication and the use of affordances in the real-life context can be optimised through the MALL design, (2) what degrees of collaboration amongst learners are preferred, and (3) what language expert support is required before, during and after MALL tasks. These questions are a focus for the next stage of research. In September 2010, another iteration of the design-development cycle commenced following the formative evaluation of the MALL prototype conducted during the evaluation within a local context phase. At time of writing, only partial data have been collected. Concurrent with the MALL solution re-design and construction, subsequent versions of design principles will be soon sketched and fed back into the system. Based on the feedback concerning the design, development and evaluation of those educational interventions, a set of interconnected design guidelines will be extracted. These heuristic principles will form a framework which will capture the knowledge about whether, when, how and why the intervention and its unique elements work in the specific context.

The resultant design principles will be formulated to guide ESP practitioners and they will not be "intended as recipes for success, but to help others select and apply the most appropriate substantive and procedural knowledge for specific design and development tasks in their own settings" (McKenney, Nieveen, & Van den Akker, 2006, p. 119).

References

Ackermann, E. (2002). *Piaget's constructivism, Papert's constructionism: what's the difference? Future of Learning Group Publication*. Retrieved from http://goo.gl/XSeGX

Anderson, T. (2007). Design-based research: a new research paradigm for Open and Distance Learning [Slideshare slides]. Retrieved from http://www.slideshare.net/terrya/design-based-research-new-research-paradigm

Bannan, B. (2009). The integrative learning design framework: an illustrated example from the domain of instructional technology. In T. Plomp & N. Nieveen (Eds.), *An introduction to educational design research* (pp. 53-73). SLO: Netherlands Institute for Curriculum Development.

Brown, A. L. (1992). Design experiments: theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences*, *2*(2), 141-178. doi:10.1207/s15327809jls0202_2

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher*, *18*(1), 32-42. Retrieved from http://www.jstor.org/stable/1176008

David, B., Yin, C., & Chalon, R. (2009). *Contextual mobile learning: principles and nutritional human being case study*. Proceedings from IADIS International Conference Mobile Learning 2009, Barcelona, Spain.

Hoven, D. (1999). A model for listening and viewing comprehension in multimedia environments. *Language Learning and Technology*, *3*(1), 88-103. Retrieved from http://llt.msu.edu/vol3num1/hoven/index.html

Hoven, D., & Palalas, A. (in press). (*Re)-conceptualizing design approaches for mobile language learning*. CALICO Special Issue: CALL in Canada.

King, A. (1993). From Sage on the stage to guide on the side. *College Teaching*, *41*(1), 30-35. Retrieved from http://www.jstor.org/stable/27558571

Kramsch, C. (2002). Introduction: how can we tell the dancer from the dance? In C. Kramsch (Ed.), *Language acquisition and language socialization: ecological perspectives* (pp. 1-30). London: Continuum.

Kukulska-Hulme, A. (2005). Introduction. In A. Kukulska-Hulme & J. Traxler (Eds.), *Mobile learning: a handbook for educators and trainers* (pp. 1-6). London: Routledge.

Kukulska-Hulme, A., & Pettit, J. (2009). Practitioners as innovators: emergent practice in personal mobile teaching, learning, work and leisure. In M. Ally (Ed.), *Mobile learning transforming the delivery of education and training* (pp. 135-156). Athabasca University: AU Press.

Kukulska-Hulme, A., & Shield, L. (2008). An overview of mobile assisted language learning: from content delivery to supported collaboration and interaction. *ReCALL*, *20*(3), 271-289. doi:10.1017/S0958344008000335

Lafford, B. A. (2009). Toward an ecological CALL: update to Garrett (1991). *The Modern Language Journal*, 93(s), 673-696. doi:10.1111/j.1540-4781.2009.00966.x

Lantolf, J. P. (2000). Introducing sociocultural theory. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 1-26). Oxford: Oxford University Press.

Lantolf, J. P. (2004). Sociocultural theory and second and foreign language learning: an overview of sociocultural theory. In K. Van Esch & O. S. John (Eds.), *New insights into foreign language learning and teaching* (pp. 13-34). Frankfurt am Main, Germany: Peter Lang Verlag.

Larsen-Freeman, D. (2002). Language acquisition and language use from a chaos/complexity theory perspective. In C. Kramsch (Ed.), *Language acquisition and language socialization: ecological perspectives* (pp. 33-46). London: Continuum.

Laurillard, D. (2007). Pedagogical forms of mobile learning: framing research questions. In N. Pachler (Ed.), *Mobile learning – towards a research agenda* (pp. 153-175). University of London: WLE Centre, Institute of Education.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. New York: Cambridge University Press.

McGarr, O. (2009). A review of podcasting in higher education: its influence on the traditional lecture. *Australasian Journal of Educational Technology*, *25*(3), 309-321. Retrieved from http://www.ascilite.org.au/ajet/ajet25/mcgarr.pdf

McKenney, S., Nieveen, N., & Van den Akker, J. (2006). Design research from a curriculum perspective. In J. Van den Akker, K. Gravemeijer, S. McKenney, & N. Nieveen (Eds.), *Educational design research: the design, development and evaluation of programs, processes and products* (pp. 67-90). New York: Routledge.

Mwanza-Simwami, D. (2009). Using activity-oriented design methods (AODM) to investigate mobile learning. In G. Vavoula, N. Pachler, & A. Kukulska-Hulme (Eds.), *Researching mobile learning: frameworks, tools and research designs* (pp. 97-122). Bern, Switzerland: Peter Lang AG International Academic Publishers.

Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). *Report 11: Literature review in mobile technologies and learning*. Nesta FutureLab Series. Retrieved from http://goo.gl/VQwaK

Pachler, N. (2009). Research methods in mobile and informal learning: some issues. In G. Vavoula, N. Pachler, & A. Kukulska-Hulme (Eds.), *Researching mobile learning: frameworks, tools and research designs* (pp. 1-16). Bern, Switzerland: Peter Lang AG International Academic Publishers.

Palalas, A. (2009). Using mobile devices to extend English language learning outside the classroom. In D. Metcalf, A. Hamilton, & C. Graffeo (Eds.), *mlearn 2009: 8th World Conference on Mobile and Contextual Learning*. Proceedings (pp. 179-183). Florida: University of Central Florida.

Papert, S., & Harel, I. (1991). Situating constructionism. In S. Papert & I. Harel (Eds.), *Constructionism*. Ablex Publishing Corporation.

Plomp, T. (2009). Educational design research: an introduction. In T. Plomp & N. Nieveen (Eds.), *An introduction to educational design research* (pp. 9-36). SLO: Netherlands Institute for Curriculum Development.

Rost, M. (2002). *Teaching and researching: listening*. Harlow, England: Longman.

Sharples, M. (2009). Methods for evaluating mobile learning. In G. Vavoula, N. Pachler, & A. Kukulska-Hulme (Eds.), *Researching mobile learning: frameworks, tools and research designs* (pp. 17-39). Bern, Switzerland: Peter Lang AG International Academic Publishers.

Sharples, M., Taylor, J., & Vavoula, G. (2007). Theory of learning for the mobile age. In R. Andrews & C. Haythornthwaite (Eds.), *The SAGE handbook of e-learning research* (pp. 221-247). London: Sage.

Thorne, S. L. (2005). Epistemology, politics, and ethics in sociocultural theory. *The Modern Language Journal*, *89*(3), 393-409. doi:10.1111/j.1540-4781.2005.00313.x

Van Lier, L. (2000). From input to affordance: social-interactive learning from an ecological perspective. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 245-259). Oxford: Oxford University Press.

Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research & Development*, *53*(4), 5-23. doi:10.1007/BF02504682

Sources cited

Business English Pod (n.d.). [English language learning website]. Retrieved from http://www.businessenglishpod.com

ESLpod (n.d.). English as a Second Language Podcast [English language learning website]. Retrieved from http://www.eslpod.com/website/index_new.html

iTunesU (n.d.). [Web-based distribution system for educational content]. Retrieved from http://www.apple.com/education/itunes-u

TED (Technology, Entertainment, Design) (n.d.). [Web-based distribution system for presentations and talks]. Retrieved from http://www.ted.com

Weinstein, N. (2001). *Whaddaya say?: Guided practice in relaxed spoken English* (2nd ed). Pearson Education USA.

Wordpress [Web-based open source blog publishing application]. Retrieved from http://wordpress.org

Published by Research-publishing.net, not-for-profit association
Dublin, Ireland; Voillans, France, info@research-publishing.net

Second Language Teaching and Learning with Technology: Views of Emergent Researchers
Edited by Sylvie Thouësny and Linda Bradley

Typeset by Research-publishing.net
Cover design by © Raphaël Savina (raphael@savina.net)

ISBN13: 978-1-908416-01-8 (Paperback - Print on demand, black and white)
Print on demand technology is a high-quality, innovative and ecological printing method; with which the book is never 'out of stock' or 'out of print'.

ISBN13: 978-1-908416-00-1 (Ebook, PDF, colour)

British Library Cataloguing-in-Publication Data.
A cataloguing record for this book is available from the British Library.