UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Ph.D. Thesis

Evaluating the use of mobile technologies for language learning purposes

Author:

Fernando Rosell Aguilar

Supervisor:

Dra. Ana María Gimeno Sanz

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Abstract

This thesis focuses on three mobile technologies: podcasting, mobile apps, and Twitter, and evaluates their potential for language learning purposes based on a series of studies with a range of users including formal learners, informal learners, and teachers. The overarching aim of the different research studies is to evaluate the three technologies through a process of a) identifying the potential of those technologies, b) investigating how they are used by learners and (where applicable) teachers, and c) analysing whether the way they are used meets the identified potential and is conducive to language learning. The overarching research questions aim to ascertain i) who uses these technologies for language learning purposes, ii) how, and iii) whether the use of the technologies leads to learning.

The introduction presents the background to the research carried out. It starts with a brief history of Computer-Assisted Language Learning (CALL) and definitions and discussion around Mobile-assisted Language Learning (MALL) and Autonomous Language Learning, followed by the types of evaluation of learning resources and environments that can be carried out within these fields. This is followed by the introduction of six concepts that shape our understanding of language learning through these technologies: the concept of teaching strangers, the development of digital capabilities, micro-credentialing, the rise in continuous partial attention, foreign language anxiety, and normalisation.

Chapter two is a compendium of the nine published works that explore the potential of the three technologies and evaluate them. It is separated into three sections with three manuscripts in each of them. Section one deals with the use of podcasting as a language learning tool. The first publication provides a taxonomy of podcast resources, reviews podcasting materials in the light of Second Language Acquisition theories, argues for better design, and outlines directions for future research. This research is presented in publications two and three. Publication two presents the results of the first major survey (1891 responses) of users of one of the most popular iTunes U content providers in terms of downloads. It provides a profile of the iTunes U language learner, their listening habits and their opinion of the resources they download, and comparisons are drawn between language learners and learners of

other subjects. The same study provides the data for publication three, which compares the responses of those participants who use static devices to play the podcasting materials they download with those of users who utilise mobile devices.

Section two of Chapter two concerns the use of mobile apps for language learning and teaching. Publication four reviews current research about the potential of apps for language learning and presents a taxonomy of available apps and their use for language learning. The paper also presents a framework consisting of four categories for evaluating language learning apps (technology, pedagogy, user experience, and language learning) and a set of criteria within the categories. The publication concludes with a proposal for areas for further research, including learner use in formal and informal contexts. These research areas are investigated in publications five and six. Publication five presents the results of a study into how a group of formal language learners use mobile apps for language learning purposes. It also provides the first comparison between app users and app non-users among language students in a formal setting and discusses the implications of these findings for learner training and app development. Publication six focuses on informal learners based on the results of a study into the use of one of the most popular language learning apps in the market: the *busuu* mobile app. Hundreds of active users of the app to were surveyed the data provide a profile of *busuu* app users, their usage patterns, their reasons for using it and what they find most valuable about language learning through apps.

Section three focuses on the third technology: Twitter as a language learning and teaching tool. Publication seven highlights the identified potential of Twitter as a language learning tool and presents an overview of different studies carried out to provide evidence of language learning using Twitter in different contexts. Publication eight shows how a group of language teachers use Twitter as a tool for continuous professional development through a hashtag and evaluates the impact of their Twitter network on their teaching practices. It also assesses whether the hashtag users can be described as a community of practice. Finally, publication nine reports on a large-scale study (n=370) of autonomous language learners who use Twitter. It provides a user profile, their practices and beliefs about how helpful Twitter is as a tool for language learning.

The results from these studies are discussed in chapter three, which also showcases the impact the research has had on the fields of CALL and MALL. Chapter four returns to the main topics and concepts presented in the introduction and provides some considerations based on the results of the research carried out. It then proposes that there may be a need to refocus the MALL research agenda and suggests directions that future developments may take. The chapter concludes with a reflection of the current pandemic and its impact on language learning and teaching through technology.

The research presented in this thesis contributes to the fields of CALL and MALL in a number of ways. First, it provides user profiles of the learners who use the three technologies. Second, it provides evidence of how those users utilise the technologies and evaluates their learning experience. Third, it presents a new taxonomy of MALL resources. Fourth, it outlines a process for evaluating the use of mobile technologies for language learning purposes, including a new evaluation framework with five criteria: technology, user experience, language learning, interaction and pedagogy.

Resumen

Esta tesis se centra en tres tecnologías móviles: *podcasting,* aplicaciones móviles y *Twitter,* y evalúa su potencial para el aprendizaje de idiomas basándose en una serie de estudios con distintos tipos de participantes, incluyendo estudiantes de enseñanza formal, de contextos informales de aprendizaje, y profesores. El objetivo general de los diferentes estudios de investigación es evaluar las tres tecnologías a través de procesos para a) identificar el potencial de esas tecnologías, b) investigar cómo las utilizan los aprendices y (en algunos estudios) los profesores, y c) analizar si la forma de utilizarlas cumple con el potencial identificado y es propicio para el aprendizaje de lenguas extranjeras. Las preguntas formuladas en la investigación persiguen analizar i) quién utiliza la tecnología en cuestión para aprender una lengua extranjera; ii) cómo se usa, y iii) si su uso conduce al aprendizaje.

La introducción presenta los antecedentes de la investigación realizada. Comienza con una breve historia del aprendizaje de idiomas asistido por ordenador (CALL, por sus siglas en inglés), definiciones y enmarca el aprendizaje de idiomas asistido por dispositivos móviles (MALL, por sus siglas en inglés) y el aprendizaje autónomo de idiomas, seguido por los tipos de evaluación de recursos y entornos de aprendizaje que se pueden llevar a cabo dentro de estos campos. A continuación, se presentan seis conceptos que afectan nuestra comprensión del aprendizaje de idiomas a través de estas tecnologías: el concepto de enseñar a personas desconocidas, el desarrollo de capacidades digitales, la micro-credencialización, el aumento de la atención parcial continua, la ansiedad por el idioma extranjero y la normalización.

El capítulo dos es un compendio de los nueve trabajos publicados que exploran el potencial de las tres tecnologías y las evalúan. Se divide en tres secciones con tres manuscritos en cada una de ellas. La primera sección trata sobre el uso de *podcasting* como herramienta de aprendizaje de idiomas. La primera publicación proporciona una taxonomía de recursos de podcasts, revisa los materiales de *podcasting* a la luz de las teorías de adquisición de segundas lenguas, aboga por un mejor diseño y sugiere direcciones para futuras investigaciones. Esta investigación se presenta en las publicaciones dos y tres. La publicación dos presenta los resultados de la primera gran encuesta (1891 respuestas) de usuarios de uno de los proveedores de contenido

de *iTunes U* más populares en términos de descargas. Proporciona un perfil del aprendiz de idiomas de *iTunes U,* sus hábitos de escucha y su opinión sobre los recursos que descarga, y se comparan los resultados de los aprendices de idiomas y los de otras materias. El mismo estudio proporciona los datos para la publicación tres, que compara las respuestas de aquellos participantes que utilizan dispositivos estáticos para reproducir los materiales de *podcasting* que descargan con las de los usuarios que utilizan dispositivos móviles.

La sección dos del capítulo dos se enfoca hacia el uso de aplicaciones móviles para el aprendizaje y la enseñanza de idiomas. La publicación cuatro revisa la investigación actual sobre el potencial para el aprendizaje de idiomas de las aplicaciones y presenta una taxonomía de las aplicaciones disponibles y su uso para ello. El artículo también presenta un marco que consta de cuatro categorías para evaluar aplicaciones de aprendizaje de idiomas (tecnología, pedagogía, experiencia del usuario y aprendizaje de idiomas) y un conjunto de criterios dentro de dichas categorías. La publicación concluye con una propuesta de áreas de investigación adicional, incluido el uso por parte del aprendiz en contextos formales e informales. Estas áreas de investigación se investigan en las publicaciones cinco y seis. La publicación cinco presenta los resultados de un estudio sobre cómo un grupo de estudiantes usa aplicaciones móviles para practicar la lengua extranjera. También proporciona la primera comparación entre los usuarios y los no usuarios de aplicaciones entre los estudiantes de idiomas en un entorno formal y analiza las implicaciones de estos datos para la formación de los alumnos y el desarrollo de aplicaciones. La sexta publicación se centra en estudiantes en contextos de aprendizaje informales basándose en los resultados de un estudio sobre el uso de una de las aplicaciones de aprendizaje de idiomas más populares del mercado: *busuu.* Cientos de usuarios de la aplicación participaron en una encuesta que analiza su perfil, sus patrones de uso, sus razones para usarla y lo que encuentran más valioso sobre el aprendizaje de idiomas a través de las aplicaciones.

La sección tres se centra en la tercera tecnología: *Twitter* como herramienta de enseñanza y aprendizaje de idiomas. La publicación siete destaca el potencial de Twitter como herramienta de aprendizaje de idiomas y presenta una descripción general de los diferentes estudios realizados para proporcionar evidencia de su uso

con este fin. La publicación ocho muestra cómo un grupo de profesores de idiomas utiliza *Twitter* como herramienta para el desarrollo profesional continuo a través de un hashtag y evalúa el impacto de su red de Twitter en sus prácticas docentes. También evalúa si los usuarios del hashtag pueden describirse como una comunidad de práctica. Por último, la publicación nueve presenta un estudio a gran escala (n = 370) de aprendices autónomos de idiomas que utilizan *Twitter.* Proporciona un perfil de usuario, sus prácticas y creencias sobre la utilidad de Twitter como herramienta para el aprendizaje de idiomas.

Los resultados de estos estudios se discuten en el capítulo tres, que también muestra el impacto que la investigación ha tenido en los campos de CALL y MALL. El capítulo cuatro vuelve a los principales temas y conceptos presentados en la introducción y proporciona algunas consideraciones basadas en los resultados de la investigación realizada. A continuación, propone que puede ser necesario reenfocar la agenda de investigación de MALL y sugiere posibles áreas de desarrollo. El capítulo concluye con una reflexión sobre la pandemia actual y su impacto en el aprendizaje y la enseñanza de idiomas a través de la tecnología.

La investigación presentada en esta tesis contribuye a los campos de CALL y MALL de varias maneras. Primero, proporciona perfiles de usuario de los aprendices que utilizan estas tecnologías. En segundo lugar, proporciona evidencia de cómo esos usuarios utilizan las tecnologías y evalúan su experiencia de aprendizaje. En tercer lugar, presenta una nueva taxonomía de recursos MALL. En cuarto lugar, describe un proceso para evaluar el uso de tecnologías móviles para el aprendizaje de idiomas, con un nuevo marco teórico de evaluación basado en cinco criterios: tecnología, experiencia del usuario, aprendizaje de idiomas, interacción y pedagogía.

Resum

Aquesta tesi se centra en tres tecnologies mòbils: *podcasting,* aplicacions mòbils i *Twitter,* i avalua el seu potencial per a l'aprenentatge d'idiomes basant-se en una sèrie d'estudis amb diferents tipus de participants, incloent estudiants d'ensenyament formal, de contextos informals d'aprenentatge, i professors. L'objectiu general dels diferents estudis d'investigació és avaluar les tres tecnologies a través de processos per a) identificar el potencial d'aqueixes tecnologies, b) investigar com les utilitzen els aprenents i (en alguns estudis) els professors, i c) analitzar si la manera d'utilitzar-les compleix amb el potencial identificat i és propici per a l'aprenentatge de llengües estrangeres. Les preguntes formulades en la investigació persegueixen analitzar 1) qui utilitza la tecnologia en qüestió per a aprendre una llengua estrangera; 2) com s'usa, i 3) si el seu ús condueix a l'aprenentatge.

La introducció presenta els antecedents de la investigació realitzada. Comença amb una breu història de l'aprenentatge d'idiomes assistit per ordinador (CALL, per les seues sigles en anglès), definicions i emmarca l'aprenentatge d'idiomes assistit per dispositius mòbils (MALL, per les seues sigles en anglès) i l'aprenentatge autònom d'idiomes, seguit pels tipus d'avaluació de recursos i entorns d'aprenentatge que es poden dur a terme dins d'aquests camps. A continuació, es presenten sis conceptes que afecten la nostra comprensió de l'aprenentatge d'idiomes a través d'aquestes tecnologies: el concepte d'ensenyar a persones desconegudes, el desenvolupament de capacitats digitals, la micro-credencialització, l'augment de l'atenció parcial contínua, l'ansietat per l'idioma estranger i la normalització.

El capítol dos és un compendi dels nou treballs publicats que exploren el potencial de les tres tecnologies i les avaluen. Es divideix en tres seccions amb tres manuscrits en cadascuna d'elles. La primera secció tracta sobre l'ús de *podcasting* com a eina d'aprenentatge d'idiomes. La primera publicació proporciona una taxonomia de recursos de *podcasts,* revisa els materials de *podcasting* a la llum de les teories d'adquisició de segones llengües, advoca per un millor disseny i suggereix direccions per a futures investigacions. Aquesta investigació es presenta en les publicacions dues i tres. La publicació dues presenta els resultats de la primera gran enquesta (1891 respostes) d'usuaris d'un dels proveïdors de contingut d'*iTunes U* més populars

en termes de descàrregues. Proporciona un perfil de l'aprenent d'idiomes d'*iTunes U,* els seus hàbits d'escolta i la seua opinió sobre els recursos que descàrrega, i es comparen els resultats dels aprenents d'idiomes i els d'altres matèries. El mateix estudi proporciona les dades per a la publicació tres, que compara les respostes d'aquells participants que utilitzen dispositius estàtics per a reproduir els materials de *podcasting* que descarreguen amb les dels usuaris que utilitzen dispositius mòbils.

La secció dues del capítol dos s'enfoca cap a l'ús d'aplicacions mòbils per a l'aprenentatge i l'ensenyament d'idiomes. La publicació quatre revisa la investigació actual sobre el potencial per a l'aprenentatge d'idiomes de les aplicacions i presenta una taxonomia de les aplicacions disponibles i el seu ús per a això. L'article també presenta un marc que consta de quatre categories per a avaluar aplicacions d'aprenentatge d'idiomes (tecnologia, pedagogia, experiència de l'usuari i aprenentatge d'idiomes) i un conjunt de criteris dins d'aquestes categories. La publicació conclou amb una proposta d'àrees d'investigació addicional, inclòs l'ús per part de l'aprenent en contextos formals i informals. Aquestes àrees d'investigació s'investiguen en les publicacions cinc i sis. La publicació cinc presenta els resultats d'un estudi sobre com un grup d'estudiants usa aplicacions mòbils per a practicar la llengua estrangera. També proporciona la primera comparació entre els usuaris i els no usuaris d'aplicacions entre els estudiants d'idiomes en un entorn formal i analitza les implicacions d'aquestes dades per a la formació dels alumnes i el desenvolupament d'aplicacions. La sisena publicació se centra en estudiants en contextos d'aprenentatge informals basant-se en els resultats d'un estudi sobre l'ús d'una de les aplicacions d'aprenentatge d'idiomes més populars del mercat: *busuu.* Centenars d'usuaris de l'aplicació van participar en una enquesta que analitza el seu perfil, els seus patrons d'ús, les seues raons per a usar-la i el que troben més valuós sobre l'aprenentatge d'idiomes a través de les aplicacions.

La secció tres se centra en la tercera tecnologia: *Twitter* com a eina d'ensenyament i aprenentatge d'idiomes. La publicació set destaca el potencial de *Twitter* com a eina d'aprenentatge d'idiomes i presenta una descripció general dels diferents estudis realitzats per a proporcionar evidència del seu ús a aquest efecte. La publicació huit mostra com un grup de professors d'idiomes utilitza *Twitter* com a eina per al desenvolupament professional continu a través d'una etiqueta i avalua l'impacte de la

seua xarxa de *Twitter* en les seues pràctiques docents. També avalua si els usuaris de l'etiqueta poden descriure's com una comunitat de pràctica. Finalment, la publicació nou presenta un estudi a gran escala (n = 370) d'aprenents autònoms d'idiomes que utilitzen *Twitter.* Proporciona un perfil d'usuari, les seues pràctiques i creences sobre la utilitat de *Twitter* com a eina per a l'aprenentatge d'idiomes.

Els resultats d'aquests estudis es discuteixen en el capítol tres, que també mostra l'impacte que la investigació ha tingut en els camps de CALL i MALL. El capítol quatre torna als principals temes i conceptes presentats en la introducció i proporciona algunes consideracions basades en els resultats de la investigació realitzada. A continuació, proposa que pot ser necessari reenfocar l'agenda d'investigació de MALL i suggereix possibles àrees de desenvolupament. El capítol conclou amb una reflexió sobre la pandèmia actual i el seu impacte en l'aprenentatge i l'ensenyament d'idiomes a través de la tecnologia.

La investigació presentada en aquesta tesi contribueix als camps de CALL i MALL de diverses maneres. Primer, proporciona perfils d'usuari dels aprenents que utilitzen aquestes tecnologies. En segon lloc, proporciona evidència de com aqueixos usuaris utilitzen les tecnologies i avaluen la seua experiència d'aprenentatge. En tercer lloc, presenta una nova taxonomia de recursos MALL. En quart lloc, descriu un procés per a avaluar l'ús de tecnologies mòbils per a l'aprenentatge d'idiomes, amb un nou marc teòric d'avaluació basat en cinc criteris: tecnologia, experiència de l'usuari, aprenentatge d'idiomes, interacció i pedagogia.

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I would like to dedicate this thesis to my parents. My dad would have been very proud, as I know my mum is.

I would also like to dedicate it to my son, Jamie, whose determination inspires me every day.

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List of abbreviations

ANOVA – Analysis of variance

ASR – Automatic Speech Recognition

CALL – Computer-Assisted Language Learning

CMC – Computer-Mediated Communication

CoP – Community of Practice

CPA – Continuous Partial Attention

CPD – Continuous Professional Development

CT – Complexity Theory

DM – Direct Messaging

HESA – Higher Education Statistics Agency

HSD – Honest Significance Differences

LL – Language Learner

LMS – Learning Management System

MALL – Mobile-Assisted Language Learning

MFL – Modern Foreign Languages

MOOC – Massive Online Open Course

NLL – Non–Language Learners

OER – Open Educational Resource

OS – Operating System

PDA – Personal Digital Assistant

PLE – Personal Learning Environment

RSS – Really Simple Syndication

SCMC – Synchronous Computer–Mediated Communication

SLA – Second Language Acquisition

SNS – Social Networking Site

TAM – Technology Acceptance Model

TELL – Technology-Enhanced Language Learning

TESOL – Teaching English to Speakers of Other Languages

TL – Target Language

TPACK – Technological, Pedagogical and Content Knowledge

TPLC – Technology, Pedagogy, Language and Culture

TULLIP – Technology, User experience, Language Learning, Interaction and Pedagogy

URL – Universal Resource Locator

VLE – Virtual Learning Environment

Chapter 1: Introduction

1 Introduction

"What is the best way to learn a language?"

This question has been asked on many occasions, and the most common answer is usually "*to live in the country where the language is spoken*". What people mean when they provide that answer is that the best way to learn a language is to immerse oneself in the language and culture of the areas where the language is spoken. Unfortunately, not all language learners have the time, resources or opportunities to do that. Many of us, however, carry a smartphone in our pockets which connects us to people and content. These connections to others, and to the materials that can be accessed online or through mobile applications, make the smartphone a rich environment for learning – some would argue that it can be used as a tool to immerse oneself in a language and its culture.

Few technologies have proliferated and become almost ubiquitous in such short time. Its impact and penetration have been wide-ranging, far-reaching and fast, integrating into the life of millions of users worldwide in just over a decade. A user's relationship with their smartphone can be rather unique: they choose the model, whether to customise, where, when and how they use it. As Traxler (2011) puts it, the devices are "both pervasive and ubiquitous, both conspicuous and unobtrusive, both noteworthy and taken-for-granted in the lives of most people" (p. 5).

When the first-generation iPhone was introduced in 2007, few could have predicted the impact it (and the many other smartphone models that followed from a variety of manufacturers) would have on the field of education. The iPhone was a game-changer in terms of the functionalities it provided, but also because it led other competitors to create similar devices (Godwin-Jones, 2011). Since then, there has been an enormous increase in the popularity and ownership of portable devices that can carry out a large variety of educational activities, including the iPad – introduced in 2010 – and similar tablet devices. As soon as they were released, educators began to see the potential for teaching of such devices (e.g. Cabot, 2010), including ubiquitous learning opportunities, ease of use, collaboration, content generation, and productivity

enhancement (Murphy, 2011). Among others, the following features of touch-screen devices such as tablets and smartphones for learning have been identified: touch screen and its responsiveness, portability and minimalist design, interaction through motion, and connectivity (Fernández-López et al, 2013). Others highlighted the positive impressions it can generate: “a beautiful, intuitive, and convincing graphical user interface adds to positive feelings in users” (Huber & Ebner, 2013, p. 327). As smartphones have evolved, new functionalities such as optical text recognition, gesture, voice and facial recognition, and the addition of haptic output (e.g. vibration) to the existing visual and auditory media have created further opportunities for learning (Reinders & Pegrum, 2017).

The potential of smartphone and tablet devices for language learning was identified early on by a number of researchers (Godwin-Jones, 2011; Lafford, 2011; Golonka et al, 2012; Kim & Kwon, 2012; Shinagawa, 2012; Sweeney & Moore, 2012; Kim, 2013; Lys, 2013; Yang & Xie, 2013; Burston, 2014). This potential is afforded by features such as enhanced text-entry, high-quality audio and video playback, picture, video and audio recording and editing, and voice recognition (Godwin-Jones, 2011). The research into the use smartphones and tablets for language learning carried out by Gimeno-Sanz, Morgana & Van der Vyver (2020) found that learners liked the many affordances inherent to the devices including portability, interactive features, ease of use, the ability to personalise the learning experience, speed, and convenience, as well as the access to varied and useful content and apps to enrich the learning experience.

A key factor in the success of the smartphone as a language learning device is the fact that all these tools are available in a single device. Cameras, audio and video recording equipment, portable media players and mobile phones were available before, but mostly as separate devices which most people would not carry with them all the time. In fact, ownership of mobile phones which only allow calls and texts, traditional wristwatches, point-and-shoot cameras and even the previously-omnipresent iPod has fallen sharply in the last decade and many of them have now become rare or even disappeared off the market altogether.

Although the hardware has clearly been the starting point in the change in device ownership and its use as language learning tool, a major factor for this has been the software available to be used with these smart devices. Before 2008, most mobile devices only carried the 'native' software provided with the device, without the possibility of adding any more. This limited the functionality of most smartphones to making and receiving phone calls, messaging, email, a basic camera, and a calendar. When Apple made its app-programming software available and welcomed third-party apps to its app store in July 2008, this allowed a proliferation of apps from all kinds of developers and created a market for app design and consumption, including education apps. As Khaddage and Lattemann (2013) put it, the fast penetration of smart devices in education is "due to open, easy, and direct access to app stores around the world" (p. 120). The success of app stores can be measured by the amount of app downloads they generate: the Apple app store only took one weekend from launch to reach 10 million downloads, and two months later it had reached 100 million (Bonnington, 2013). It took less than a year for the billionth app to be downloaded, and by May 2013, the number of apps downloaded from the iTunes App store alone reached 50 billion (Apple, 2013), In two years this amount had doubled to 100 billion downloads (Fiegerman, 2015). Although the Apple app store was the first to launch, it has now been overtaken by the Google App Store, which is reported to generate three times the number of app downloads (Iqbal, 2020). The market continues to grow, and in 2019 alone, over 200 billion apps were downloaded from app stores worldwide (Clement, 2020). Educational apps represent only a fraction of these downloads, of course, but the figures demonstrate the enormous impact apps have had in the last few years.

The smartphone may be viewed as a self-access facility, or even an immersion tool, used for relatively short periods of time for very specific and targeted language learning activities, or to interact with communities of learners and speakers of the target language, in different locations, at different times (Figure 1).

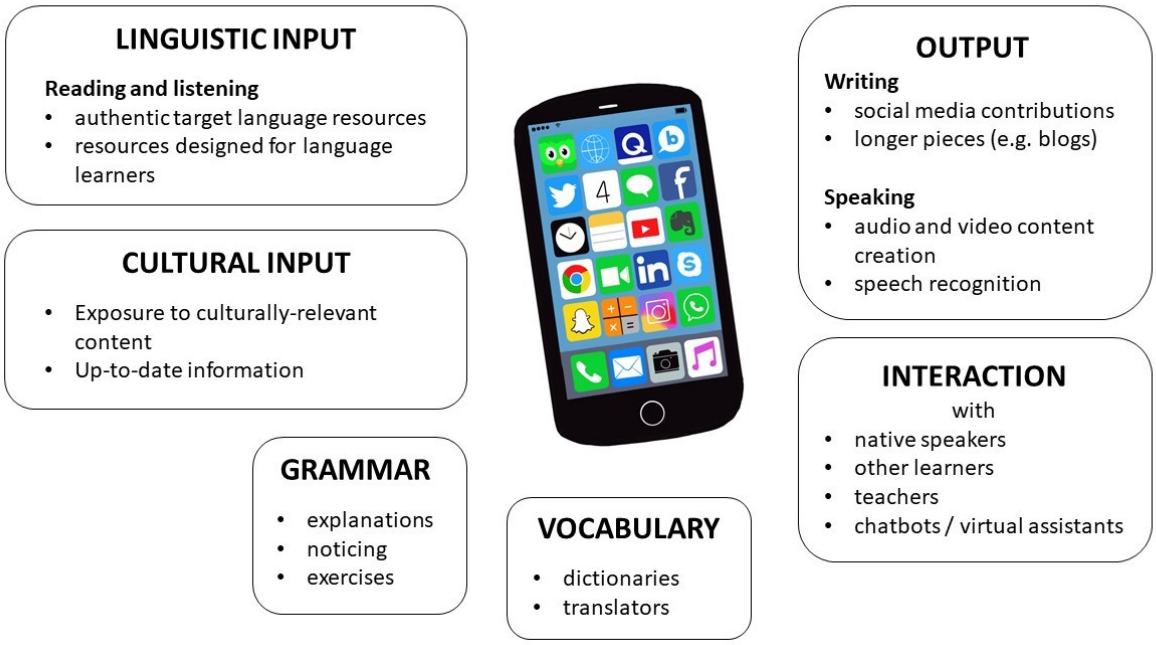

Figure 1: the smartphone as language learning tool.

Language learning aims to develop the ability to communicate, in oral and / or written form, with others. Traditionally, this communication happened through face to face interaction, phone calls, letters, and writing in general. Later, communication began to take place through computers: asynchronously (email, forums) and synchronously (instant messaging, voice over the internet software and its successors). Much of this communication technology has merged in the smartphone, which allows interaction through phone calls, multimedia messaging, email, video chat, and social networking.

But how does the identified potential of the smartphone as a language learning tool become reality? What are the implications of its use for language learning? How are they used for language learning purposes? By whom? Which technologies among all the different apps available have the largest potential for language learning?

1.1 Three technologies for language learning

This thesis presents a number of studies into how three technologies mainly accessed from smartphones enable the user to engage in learning activity conducive to language learning. The three technologies are podcasting, mobile applications, and Twitter. These three technologies cover the main skills that learners should develop in

their language learning process. Podcasting provides opportunities to enhance listening skills as well as speaking skills for learners involved in podcast production; apps designed for language learning provide opportunities to practise grammar and vocabulary, whereas apps that are not designed for language learning but are useful for language learners such as those from news corporations provide access to reading material; Twitter provides a gateway to curated resources in the target language, short texts from a variety of individuals and institutions with a range of registers, and opportunities to write in the target language and interact with other learners and L1 speakers.

I Podcasting

A podcast is a series of regularly-updated media files (audio or video) that can be played on a number of devices (portable or static) and are distributed over the internet. Podcasting technology was created in the 1990s, but started to become commonplace around 2004. The word 'podcast' made the transition from technical term to commonplace use in a very short time. In 2005, it was named "word of the year" by the editors of the Oxford American Dictionary (BBC News, 2005). Since then, podcasting technology has spread, expanded and become easier to use, which has led to its adoption by individuals, businesses, the arts, the media and, of course, education. Podcasting fits with the current movement towards free open-access educational content, as exemplified by Open Educational Resources (OER) and Massive Online Open Courses (MOOCs). These are alternatives to formal study, although they can be combined with it, and bring learning to people who might otherwise not have access to it. Learners do not usually follow a traditional pathway through these, but instead choose what is of interest to them at a personal level.

Podcasts are available in many languages, and therefore they were quickly identified as a rich source of target language material for language learners (Chinnery, 2006; Godwin-Jones, 2005; Kukulska-Hulme, 2006; Stanley, 2006; Thorne & Payne, 2005). Language teachers had been using audio cassettes, CDs and videos for a long time before podcasting came along. Those audiovisual materials, however, had to be purchased or borrowed from a library, and their availability was limited. Their audience

was learners who were interested in learning and made the effort to seek those resources and pay for them. With podcasts, materials became free and easy to find, and also easy to play without the need for language laboratories or multiple devices. Within seconds, a user could have it in their mp3 player, mobile phone or many other devices. Among the main potential benefits of podcasting is the fact that the materials are delivered in a format that is portable, convenient and easy to use (Blaisdell, 2006; Clark & Walsh, 2005) as well as easy to access. The user can control the pace at which the information is delivered to them – using the pause button, for example - (Sloan, 2005). Another benefit is the low cost to the user and to the developer: podcast downloads are free, and their development is faster and cheaper than producing traditional materials (Moody, 2006). Some researchers also mention the potential to allow contact time with students in the classroom to focus on interaction, shifting preparatory work to outside times and locations (Blaisdell, 2006) as well as integrating in-class and out-of-class activities and materials (Thorne & Payne, 2005). In addition, many language educators produce teaching podcasts that can be downloaded by language learners and listened to anytime and anywhere. A third frequent use of podcast technology is the production of content by learners themselves.

Manning (2006) identified some limitations to podcasting. Among these, she included file size, download times, technical ability, and server space (all of which have for the most part become lesser issues as devices and connections have improved). Other challenges, such as the lack of searchability of files and the potential for information overload (Blaisdell, 2005), remain an issue well over a decade after being highlighted.

Language learning podcasts vary enormously in terms of design format: long monologues, bite-sized information, interactive conversations, vocabulary lists, phrase of the day, recipes, interviews, news, showcases of student work… They also vary in terms of quality. This thesis will explore the research questions surrounding the use of podcasting as a language learning tool and present answers based on research into its use.

II Apps

Apps (Mobile applications) are software programs that run on operating systems for mobile devices. A large number of education apps are available in app stores. Users can use them to engage in learning opportunities in a variety of places at any time they find convenient and at a pace that suits them. Educational apps exploit the potential of mobile device features such as a responsive touch screen, high-quality audio and video playback, enhanced text-entry, recording and editing, voice recognition, large storage, and fast connectivity (Godwin-Jones, 2011) as well as their portability and intuitive interfaces.

Among the first to identify the potential of apps as language learning tools was Rosell-Aguilar (2009), who highlighted the use of translation, dictionary and voice recording apps for language practice as well as other apps (whether designed for language learning purposes or not) with potential to increase students' awareness of the culture of areas where the target language is spoken. Other researchers who presented potential benefits of app for language learning purposes included Cabot and Gómez (2010), Godwin-Jones (2011), Burston (2014), Lafford (2011), Kim and Kwon (2012), and Sweeney and Moore (2012). The identified potential advantages included ease of use, productivity enhancement, and the potential for ubiquitous learning opportunities such as collaboration and content generation (Murphy, 2011). Lafford (2011) was among the first to refer to the use of more than one app as part of a single language learning activity, now commonly referred to as appsmashing.

Early criticisms of language learning apps focused on the fact that many apps focused on cognitive processes (recognition, recall and comprehension of vocabulary) and receptive language skills rather than socio-cognitive activities, with little collaborative learning (Kim & Kwon, 2012). Other criticisms included excessive reliance on translation activities, little or no use of sound or pictures, poor navigation and user-interface design, and not taking advantage of the unique properties of smartphones, connectivity with other users in particular (Godwin-Jones, 2011; Sweeney & Moore, 2012). Burston (2014) concluded that language learning activities on mobile apps were mostly a replication of what had been done before with other technologies and limited to basic flashcards, multiple choice, blank filling, drag and drop and vocabulary and grammar drills and games and that, therefore, "pedagogically, nothing new has been done with smartphones that has not already been done with earlier mobile devices"

(Burston, 2014, p. 108). Whilst some providers continue to design language learning apps that do not address these drawbacks, in the last few years many developers have produced new apps that offer a larger variety of activity types, make good use of audiovisual assets, and connect learners with native speakers or other learners.

Apps for language learning include translators and dictionaries, apps specifically designed to learn or practice languages, and apps that have not been designed for language learning purposes but are useful to language learners. This thesis will explore the potential of apps as language learning tools, present a taxonomy of apps based on these different types, and how they are used by language learners.

III Twitter

Twitter is a micro-blogging social media tool where users can post messages (tweets) of up to 280 characters in length as well as photos, videos, polls, and hyperlinks to websites and other resources. Since its launch in 2006, Twitter has become a hugely popular tool with large societal impact on fields including news, entertainment, politics, business, sports and education.

The language learning potential of Twitter was quickly identified by a number of researchers (Dickens, 2008; Borau, Ullrich, Feng & Shen, 2009; Harmandaglou, 2012; Newgarden, 2009). Among the potential benefits of using Twitter as a language learning tool, Craig (2012) listed linguistic benefits such as noticing vocabulary, expressions, idioms and grammar; cultural benefits such as access to native speakers and insight into their routines, opinions, media and general interests; and social benefits including extending learning outside the classroom, and social presence. Hattem (2014) argued that the ease of access to varied materials in the target language could make Twitter a rich environment for comprehensible input (Krashen, 2003), comprehensible output (Swain, 2005), and meaningful interaction (Long, 1996). For Borau et al (2009), a major benefit of engaging with Twitter was the possibility for learners to express themselves in the target language, whereas Newgarden (2009) and Sinnappan and Zutshi (2011) focused on the potential for engagement with native speakers and forming a community of language learners. Furthermore, Plutino (2017)

highlighted the potential of Twitter as an environment where learners can increase their awareness of popular culture and be used to share experiences of visiting a target language area. It has been stated that online social networks afford more opportunities for authentic and meaningful language use than can be provided in the classroom, and “these learning opportunities are more likely to be interactive, social, and multimodal” (Richards, 2015, p. 6).

Until November 2017 tweets were limited to 140 characters, a fact which was perceived as both an advantage and hindrance by language learning experts. Some though that the limitation was not conducive to natural language and could lead to bad grammar use (Grosseck & Holotescu, 2008), whereas others pointed out that the character limit encouraged more precise thinking, editing and synthesising of language (Dunlap & Lowenthal, 2009; Plutino, 2017).

Although most research into the use of Twitter has focused on experiences of learners taking part in teacher-directed activities in formal learning settings, many language learners engage with Twitter autonomously. In addition, Twitter is also used for a variety of purposes by language teachers. This thesis presents the different uses of Twitter by both language learners and teachers, types of use, beliefs and evidence of learning, and explores the concept of online communities of practice based around a hashtag.

1.2 Potential and evaluation of the three technologies

Knowledge, as it is understood from a constructivist point of view, is constructed through active exploration, observation, processing and interpretation (Cooper, 1993). Accessing language learning resources through technologies such as apps or podcasts is consistent with this learning process, where the user can access resources and activate knowledge. The social dimension of knowledge construction, following the Vygotskian socio-constructivist perspective, which claims that human development is socially situated and knowledge is constructed through interaction with others, can be added through the interaction among peers or between tutors and learners that some learning environments can afford, such as Twitter. The use of these technologies is also consistent with the view of learning as something that happens in

everyday life outside the classroom, whether intentionally or accidentally, as advocated by theories of informal and lifelong learning (Naismith, Lonsdale, Vavoula, & Sharples, 2004). By accessing podcasts and listening to them, using apps for language learning purposes, or engaging with others on social media on Twitter, learners are integrating learning into their lifelong learning processes.

All of these technologies have the potential to provide access to materials that fit with Second Language Acquisition (SLA) theory recommendations, such as those that are authentic (Little, 1997), those that incorporate meaningful and engaging activities (Oxford, 1990), those that offer opportunities to hear modified comprehensible input that allows focus on target features of the second language (Holliday, 1999), and those that are appropriate to the medium used (Furstenberg, 1997).

This chapter presents the background to the research carried out. It starts with a brief history of Computer-Assisted Language Learning (CALL) and definitions and discussion around Mobile-assisted Language Learning (MALL) and Autonomous Language Learning, followed by the types of evaluation of learning resources and environments that can be carried out within these fields. This will be followed by the introduction of six concepts that shape our understanding of language learning through these technologies. Next, a description of aims of my research and the methods used to evaluate the impact of the three technologies as language learning tools will be described. Finally, an outline of the remaining parts of the thesis will be presented.

2 Computer-Assisted Language Learning

Computer-Assisted Language Learning (CALL) involves the use of digital technology for the purposes of language learning. The field was often referred to as TELL (Technology-enhanced language learning) as at the time that it started developing, the term “technology” mostly referred to desktop computers and it was on the use of these that most research focused on. Levy defined CALL as “the search for and study of applications of the computer in language teaching and learning” (1997, p.1). This involves both the development of software and hardware, the use of existing digital

tools for language learning purposes, and the study of how the use of these technologies can lead to language acquisition.

CALL has gone through a number of phases since the 1960s, when computers began to be used for language learning, and these reflect the changes that SLA has gone through as a field of study. Warschauer and Healey (1998) referred to the first three phases of CALL as Behaviouristic, Communicative, and Integrative. Behaviouristic CALL (later referred to as Structural CALL) is the phase that took place around the 1970s, when the methodologies used in the design of language learning software were mostly based on behaviouristic pedagogical approaches. This was mainly centred on the teacher and the computer as providers of knowledge, on which the learner would be tested. Exercise types were very limited (mostly gap filling or multiple choice) and activities were text-based. The phase between the 1980s up to the mid-90s is Communicative CALL, where the emphasis shifted to the communicative approaches that were in fashion at the time. This phase also coincided with the enormous growth in popularity of the home computer. Learners were able to access or purchase CD-ROMs, which brought more varied activities and simulations, but also used other software available on the computer for language learning purposes, such as word-processing, presentation, or audio and video editing software. The third phase became known as Integrative CALL, and it started with the arrival of multimedia content and access to the internet in the mid-1990s. The name is based on the idea of learning activities being integrated into larger tasks, with the computer being not only the medium of delivery of content but also the medium for human-to-human interaction through technology. Activity types included all four skills (reading, writing, listening and speaking), and users became more in control of their learning as well as creators of content.

Other ways of categorising CALL have been proposed both before and after Warschauer and Healey's. Perhaps the most interesting is that of Bax (2003, 2011b) as it introduces the concept of normalisation (which will be explored below) and also is more flexible with the dates of each phase. Bax's categorisation of the trajectory of CALL also refers to three phases: Restrictive CALL, Open CALL, and Integrated CALL. Restrictive CALL is very close to Behaviouristic / Structural CALL. Open CALL (named to contrast the restrictions of the previous phase) refers to the more open

nature of the activities that can be undertaken and the roles of the teacher, learner, and technology. Integrated CALL is the phase in which the use of technology for language learning is normalised, i.e. used in language education without users being consciously aware of its role as a technology. At the time of writing his categorisation, 2003, Bax claimed that we had not reached integrated CALL yet - he reiterated this in 2011.

In 2016, Chun proposed a fourth stage of CALL which she termed Ecological CALL. In her description of this stage, Chun extended the range of technologies to include mobile and wearable devices, the language teaching paradigm to digital literacies and multiliteracies, the view of language from socio-cognitive to symbolic and intercultural competence, the main use of devices as global communication, and the principal objective of CALL as identity as global citizens. She argued that this view of language acquisition goes beyond the classroom walls and that learners, in addition to developing target language grammar, vocabulary and pragmatics, "need to acquire the cultural know-how for dealing with technologized forms of language, either as producers or interpreters of meaning" (p. 106). Also in 2016, Gimeno-Sanz proposed that the current (from 2010) age of CALL (chronologically following Warschauer's Integrative CALL and Bax's Open CALL phases) is Atomised CALL. Atomised CALL moves away from structured 'All-in-one' solutions (such as CD-ROMs which integrated grammar teaching and practice with audiovisual media in a single piece of software) to unstructured meaningful resources (or 'atoms' such as individual apps, podcasts, or websites) which are then utilised alone or in combination with other resources either individually by learners or integrated into the curriculum by teachers, whose job is to scaffold them coherently. The learning is therefore needs-driven rather than technology-driven. The 'atoms' that Gimeno-Sanz (2016) refers to are similar to the more-commonly used concept of learning objects, which Kovalchick and Dawson (2003) describe as "educational materials designed and created in small chunks for the purpose of maximizing the number of learning situations in which the resource can be utilized" (p.1). The distribution of content as learning objects has become commonplace and, in some cases, delivered as OER. Gimeno-Sanz (2016) points out that there has been a circular movement through the CALL ages in which resources were integrated into 'all-in-one' solutions which have now separated into atoms. She argues that given the current rapid pace of technology development, it becomes CALL

developers' and researchers' job to find the best way to exploit these for pedagogical purposes. She adds, however, that the rapid pace of development is also a challenge for the field of CALL, as technology moves forward faster than it can be evaluated, and therefore training instructors to find the best way to integrate these resources into their teaching practice becomes a priority.

Following Levy's definition, CALL is concerned with searching for and studying how the 'computer' (which nowadays is understood to refer to most digital devices) is used to teach and learn languages. Whilst its main focus remains the acquisition of the language areas and skills: grammar, vocabulary, reading, writing, listening, speaking, and culture (Levy, 2009), the field of CALL is much more diverse than it was in its early stages, when similar types of software and hardware were used in similar contexts (e.g. CD-ROMs in computer labs). Technology has evolved, with an increase in the range of technologies available as well as faster connections, cheaper prices, and wider ownership. Learners own sophisticated devices and use them for language learning purposes, and - in some cases - they know the technologies and how to use them far better than their teachers do. This has led to a growing diversity in technologies, environments where they are used, pedagogies utilised, users, and research methods (Stockwell, 2012).

One striking aspect of the development of CALL materials is that it has mostly been initially led by software developers rather than SLA or CALL experts. In many cases, the adoption of new technologies has brought with it a step backwards in terms of the pedagogies used. CALL research had identified a number of principles of good practice in materials design based on the CD-ROM experience. When the use of web-based materials began to overtake the use of CD-ROM, developers seemed to focus on very behaviouristic drilling exercises, and this again became the case with the first language learning apps. Gimeno-Sanz (2016) laments the loss of the high-quality materials that were developed on CD-ROM, and attributes the rudimentary nature of the initial web-based materials to the lack of sophistication in the tools available at the time. Stockwell and Hubbard (2013) discuss how early attempts in the design of CALL focused on transferring tasks that were designed for pen and paper to the computer environment without taking advantage of the potential for interactivity, and how this

has been replicated in the introduction of other technologies, such as mobile learning. Similarly, Burston (2014) pointed out that in many MALL research studies, instructors had chosen a teacher-centred approach and behaviourist frameworks, and although mobile devices were being used to access content and engage in language practice, this remained an individual activity and the communication features to engage with other learners or native speakers were not being exploited.

To help understand the complexities of the CALL field, many researchers have made use of multiple theoretical perspectives (Levy & Stockwell, 2006), mostly from the fields of education and second language acquisition. Based on her previous work (Conole, Dyke, Oliver & Seal, 2004), Conole (2008) mapped technologies to the four main theories of learning (Table 1). This serves as an illustration of how learning with technologies can address different types of learning approaches and beliefs. However, as she pointed out, despite the affordances of technologies for social and situated learning activities, formal education continues to evaluate learning by assessing individual achievement.

Theories	**Main focus**	**Map to technologies**
Behaviourism	• Trial and error learning • Learning through association and reinforcement	• Presentation of content, use of multiple media to convey information • Feedback through e-assessment tools • Peer feedback
Cognitive constructivism	• Focus on the processes by which learners build their own mental structures when interacting with an environment • Task-orientated, favour hands-on, self-directed activities orientated towards design and discovery	• Guided and adaptive instruction through interactive materials • Access to resources and expertise offers the potential to develop more engaging and student-centred, active and authentic learning environments
Social constructivism	• Emphasis on interpersonal relationships involving imitation and modelling and joint construction of knowledge	• Multiple forms of asynchronous and synchronous communication offer the potential for more diverse and richer forms of dialogue and interaction between

		students and tutors and amongst peers • Archive materials and resources provide ample opportunity for vicarious learning • Different online communication tools and learning environments and social fora offer the potential for new forms of communities of practice or facilities to support and enhance existing communities
Situated learning	• Learning as social participation • Shift from a focus on the individual and information-focused learning to an emphasis on social learning and communication/ collaboration	• Networking capabilities of the Web enable more diverse access to different forms of expertise and the potential for the development of different types of communities • Online communication tools and learning environments offer the potential for new forms of communities of practice or can facilitate and enhance existing communities

Table 1: Technology affordances mapped to different learning theories (Conole, 2008)

Although in the field of SLA the role of communication and interaction is more prominent than in other subjects, many CALL practices remain firmly based on behaviouristic principles of learning.

The bare minimum a CALL theory needs to take into consideration is the learning of language and the relationship between the device and the user for this purpose (Stockwell, 2012). The CALL research agenda has been extensively debated (e.g. Chapelle, 1997; Hubbard, 2003; Chun, 2012; Smith & Schulze, 2013; Levy, Hubbard, Stockwell, & Colpaert, 2015) and continues to be so, with foci on both research and practice and how they influence one another. This has included research aims and methodology, evaluation of technologies, content, learners, teachers, media, environments, conditions for learning and acquisition of language, among many others. Section 7 in this chapter outlines the gaps in knowledge, research questions

and methods used in this thesis for the evaluation of the three technologies that are the focus of research.

3 Mobile-Assisted Language Learning

One feature common to all the technologies that this thesis focuses on is mobility. Mobile learning (or m-learning) takes place “when the learner is not at a fixed, predetermined location, or when the learner takes advantage of the learning opportunities offered by mobile technologies” (O’Malley et al. 2003, p. 7). Those learning opportunities continue to evolve as new types of devices and technologies arise. The last 15 years have seen an enormous growth in availability and ownership of devices that can be utilised for mobile learning (personal media players, mobile phones, smartphones, small tablets, wearable technology) and the advances in technology that allow storage of content (larger memory at affordable prices, cloud computing) and connectivity (higher download speeds, lower cost). Some early definitions of mobile learning were device-centric, whereas more recently the term ‘mobility’ refers not only to the devices, but also the learners and the learning experience itself (Pegrum, 2014). As a consequence, a more encompassing definition of mobile learning refers to learning that “mediated by mobile devices, characterised by the mobility of the learners, and/or the mobility or accessibility of the content considered” (Hamm et al, 2014, p.3).

It is important to consider which devices can be described as mobile devices (Reinders & Pegrum, 2017). Despite disagreements over this, the differentiation suggested by Puentedura (2012, in Reinders & Pegrum, 2017) between portable devices (which can be turned on and used in different separate locations) and mobile devices (which are always on and used in different locations and the places in between) is generally accepted. Following this classification, laptops and game consoles would be portable devices and smartphones, tablets and wearable technologies such as smart watches or smart glasses would be classified as mobile devices.

Early attempts at mobile learning were mostly a transfer of e-learning to a mobile device, without consideration for how this transfer necessitated a mobile learning

pedagogy. Even this basic transfer approach, however, brought learning to individuals and communities who may not otherwise have had the access that others had because of geographic location, economic or social circumstances, and psychological or cognitive differences (Traxler, 2011). Furthermore, the bite-size nature of many mobile learning resources has provided additional opportunities for learning in short periods of time and new locations (ibid). Mobile learning achievements include enhancing learning, reaching out to remote learners, theory building, motivation and community building, although not without challenges (Traxler, 2011). Sung, Chan and Liu's (2016) meta-analysis of mobile learning research reports concluded that learners were more engaged when using mobile devices than when using desktop computers. The growth in availability and popularity of mobile devices have made them ubiquitous in many territories, with some arguing that "as mobile devices become even more powerful and versatile, we are likely to see more users make them their primary, perhaps their sole computing devices." (Godwin-Jones, 2011, p.8). Mobile learning "can enhance, extend and enrich the concept and activity of learning itself, beyond earlier conceptions of learning" (Traxler, Bárcena & García Laborda, 2015, p. 1236), including ideas of contingent learning and teaching, enquiry-based, collaborative, situated, authentic, context-aware, personalised and game-based learning, augmented reality, learning and pastoral support, and assessment techniques aligned to the new affordances mobile learning can provide.

Mobile learning has been categorised in a number of ways: Hulme and Traxler (2005) identified two types of mobile learning: didactic and discursive learning. Didactic mobile learning involves "learning from mobile educational material (…) in a way that responds to the potential and the limitations of mobile devices" (Kukulska-Hulme & Traxler, 2005, p. 26), which in the context of this thesis is afforded through podcasts, apps and exposure to content on Twitter. Discursive mobile learning is based on the interaction among mobile learners, which some apps and Twitter afford. Kearney et al. (2012) categorise mobile learning according to what they consider to be its main affordances for learning: personalisation, collaboration and authenticity. Traxler and Kukulska-Hulme (2015) describe how technological advances and the way learning is being reconceived, however, have given way to a 'next generation' in mobile learning which makes use of the devices' awareness of the context they are being used in. This

next generation of mobile learning is characterised by a shift in the context of mobile learning “from the legacy of learning with computers to the ubiquity of social use of mobiles” (Traxler & Kukulska-Hulme, 2015, p. 2).

Mobile-Assisted Language Learning (MALL) is defined as the use of “mobile technologies in language learning, especially in situations where device portability offers specific advantages” (Kukulska-Hulme, 2013, p. 3701). The fact that language learning content is often offered in small portions (e.g. a short video, a grammar drill, a vocabulary exercise) means that it is one of the disciplines to have benefitted most from mobile learning (Kukulska-Holme, 2015). MALL research sits in the intersection of Mobile Learning and CALL research (Stockwell & Hubbard, 2013). Pegrum (2014) classified MALL into 4 types, arranged in order of increasing interactivity: MALL for content, MALL for tutorials, MALL for creation, and MALL for communication. MALL for content refers to access to materials that are useful for language learning, both text-based and multimedia including podcasts and videos. MALL for tutorials covers the provision of web and app-based language courses and exercises, which tend to be behaviourist in approach. MALL for creation includes practices (mostly teacher-led) of generating digital artifacts which can range from simple pictures to more advanced multimedia objects. Finally, MALL for communication involves interaction between learners and fellow learners, teachers, and / or native speakers through social media, gaming or augmented and virtual reality, for example.

Early reports on MALL focused on teacher-led activities (Kukulska-Hulme & Shield, 2008), and these continue to be the most common settings reported in the literature, with most works providing comment or advice on integration in the curriculum and teacher training (e.g. Pegrum, 2014). Some important considerations about the use of mobile devices for teacher-directed activity in and outside the language classroom include device ownership (and the impact that lack of ownership may have on learners) and the factors affecting learner willingness to use their device for language learning, which include cost, connection strength, data storage, use of apps which may access personal data, sharing / publishing, and the differences that the variety of devices being used may bring to the learning activity (Kukulska-Hulme, Norris & Donohue, 2015).

Although initial claims about MALL focused on the devices themselves, the focus shifted to the learner and the tasks that they can engage in using the devices (Comas-Quinn, Mardomingo & Valentine, 2009). Kukulska-Hulme and Shield (2008) stated that MALL provides students with rich, real time, convenient, and contextual learning opportunities both in and outside the classroom, and Burston (2012) referred to the outcomes of the implementation of MALL as "unquestionably positive" (p. 16). MALL affords access to second language learning through the real world (Palalas, 2011) and can provide an informal, interactive, and ubiquitous experience (Kimura et al., 2011; Taj, Sulan, Sipra, & Ahmad, 2016), removing time and place constraints (Miangah & Nezarat, 2012). Ok and Ratliffe (2018) found that among the benefits of using mobile devices for languages learning were academic improvement, improving motivation and engagement, creating student-centred learning environments, increased time on task, and extended learning opportunities. Research has supported these claims: Burston (2015) carried out a meta-analysis of MALL research and found significant results in reading, listening and speaking. However, he also found that in many cases the measures of learning outcomes were not statistically reliable. Another meta-analysis of the use of MALL for vocabulary learning concluded that it can be effective in all aspects, with improvements across both receptive and productive learning (Mahdi, 2018). Indeed, vocabulary learning is the most common MALL activity reported in the literature (Pegrum, 2014). The use of smartphone apps for situated language learning for people who have recently migrated to a country with a language that is new to them has also been explored in projects such as *Minclusion* (Spante, Hashemi, Lundin, & Algers, 2018), *SALSA* (Gaved & Peasgood, 2017), and *MASELTOV* (Kukulska-Hulme, Gaved, Paletta, Scanlon, Jones & Brasher, 2015).

Among the factors that can negatively affect the mobile language learning experience, Reinders and Hubbard (2013) include screen size and "the often distracting environments in which they are used" (p. 366). Stockwell and Hubbard (2013) also mention the novelty effect, which may affect impressions during early attempts to use a technology, and the user's readiness to employ the technology. There is also evidence that learners find it frustrating to identify – and sometimes access – appropriate materials and support (Kukulska-Hulme & de los Arcos, 2011). Stockwell and Hubbard (2013) divided the relevant issues affecting MALL into three domains which stakeholders (learners, teachers, policy makers and employers) need to be

aware of for its successful implementation: physical issues (such as screen size, compatibility, storage or battery life), pedagogical issues (ensuring that learning tasks are appropriate for the devices being used), and psycho-social issues (such as the possible conflict between personal and educational use of mobile devices, and social media identities).

The ubiquitous presence and regular use of smartphones and tablet devices poses the question of whether the fact that the learning experience takes place on a mobile device makes any difference to the learning experience. Most websites are now optimised for mobile access so that users have a comparable experience whether they access it from a desktop computer or a mobile device, and some services are only available through an app rather than a website. Tablet devices are increasingly the only device that some users utilise instead of a personal computer or a laptop, and they may well be used only in an almost-static location (different parts of the user's house, for example) in a way that is more consistent with the definition of a portable rather than mobile device. With few exceptions (such as concordancing), most of what has happened in CALL now happens in MALL.

Since the majority of the literature and research into MALL has focused on teacher-directed mobile language learning activities, or on students in formal education using mobile devices autonomously, the use of MALL by language learners who are not in formal education and use mobile devices for autonomous learning remains under-researched. The next section explores the nature of autonomous learning in general, applied to language learning, and in the fields of CALL/MALL.

4 Autonomous Language Learning

Autonomous learning is "the ability to take charge of one's own learning" (Holec, 1981, p. 3). This involves being responsible for making all the decisions related to learning such as setting objectives, choosing methods and materials, monitoring progress, and evaluating the learning achieved. To manage this, learners need to have "a capacity for detachment, critical reflection, decision making and independent action" (Little,

1991, p. 4) or, as Littlewood (1996) put it, both the ability and the willingness to do so. The ability refers to the knowledge and skills to make the necessary choices, and the willingness to the motivation and confidence that the learner needs to achieve their goal. There have been attempts to classify learner autonomy and different degrees of it, since autonomy in itself "is not an absolute concept" (Nunan, 1997, p. 13). Littlewood (1999) suggested two types: proactive and reactive. Proactive autonomy is closer to the generally-accepted definition, since it involves setting one's own learning agenda, planning, monitoring and accessing learning. Reactive autonomy does not involve setting the agenda, but still includes organising the learning to achieve the set goal. Becoming autonomous is not something that learners achieve quickly or easily. It is "a gradual process that requires transitions from teacher-dependence to self-dependence and from fixed content to variable content" (Healey, 1999).

At this point, it is useful to differentiate between a number of terms that are sometimes used interchangeably. Whereas the term 'formal' conjures up a fairly standard image of a school or Higher Education setting, the term 'autonomous learning' does not work in the same way and this can lead to confusion. There are many terms that are equated with it, including informal, non-formal, independent, self-directed, self-regulated, out-of-class learning, and learning 'in the digital wilds'. A useful metaphor to differentiate formal and informal learning was formulated by Cross (2011), who compared formal learning to riding a bus (there is a pre-established route and passengers just get on to get to the destination) and informal learning to riding a bicycle (where the learner chooses where they are going, which way, and how fast). The European Commission (2001) defined formal, non-formal, and informal learning as follows:

- Formal learning: learning typically provided by an education or training institution, structured (in terms of learning objectives, learning time or learning support) and leading to certification. Formal learning is intentional from the learner's perspective.

- Non-formal learning: learning that is not provided by an education or training institution and typically does not lead to certification. It is, however, structured

(in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's perspective.

- Informal learning: learning resulting from daily life activities related to work, family or leisure. It is not structured (in terms of learning objectives, learning time or learning support) and typically does not lead to certification. Informal learning may be intentional but in most cases it is non-intentional (or 'incidental'/ random). (European Commission, 2001, pp. 32-33)

Other definitions refer to 'independent learning' and 'out of class' as something that learners do outside the classroom, whether this is teacher-directed or following their own initiative. Self-regulated and self-directed learning generally refer to the processes of planning, monitoring and reflecting on one's performance towards a learning goal. In addition, as pedagogical approaches such as 'flipped learning' or the initiatives to recognise informal prior learning blur the boundaries of in-class and out-of-class activity, the terminology becomes more confusing. Alm (2019) proposes the term *intra-formal learning* to describe the interdependent relationship between these. Finally, a more recent term related to autonomous language learning in particular is 'learning in the digital wilds', defined as "informal language learning that takes place in digital spaces, communities, and networks that are independent of formal instructional contexts" (Sauro & Zourou, 2017, p. 186). This type of learning is characterised by originating from the learner and not an instructor, curriculum or policy, and not being governed or developed by an educational institution, but also by the fact that the primary goal of learners who undertake activities in the wild is not language learning (Sauro & Zourou, 2019).

The numerous terms can be classified more simply into two categories depending on whether the learning activity has some degree of teacher involvement (set as homework, practice or assessment) or not. The educational context where learning takes place has an impact in many ways. Many theoretical publications and empirical studies refer to autonomous learning as something that learners who are in formal education do out of class, whether teacher-directed or not. For example, in a special issue of *Language Learning and Technology* on learner autonomy in 2011, only one of the articles (Nielson's, 2011) centred around truly autonomous learning by learners

who were not enrolled in formal education. The rest of the studies centred around activities that formal learners did out of class.

Another factor is whether the learner is in formal education or not. Here, it is useful to consider the terminology referring to the person who is learning. The literature in SLA and CALL has traditionally referred to ‘students’, people (usually under 25 years of age) who are in formal education of some kind: school, high school, or university. With autonomous learning, it is more appropriate to talk about ‘learners’, as this term also encompasses people who may be learning outside formal education.

For the purposes of this thesis, autonomous learning will follow the same definition as that of learning in the digital wilds, but with a key difference: that learners that engage in autonomous learning do so with the primary goal of learning.

An important aspect of autonomy is that it is not an attribute of the learning situation, but of the learners themselves (Benson, 2007). Autonomy is mostly achieved at an individual level, and concepts such as learner preferences, learner’s needs and personalised learning become key factors in the development of autonomy: “for learning to be autonomous, learners must be able to seek out, recognize, and capitalize upon learning opportunities for themselves” (Stockwell, 2012, p. 9). Individual, however, does not mean alone, as there is a social aspect. As Godwin-Jones (2019b) states: “through social participation, individual autonomy is enhanced, language skills are developed, and personal identity is expanded” (p. 19). It has been argued that having control of the learning process and personalised learning may lead to increased motivation and higher cognitive engagement than the traditional classroom (Schwienhorst, 2002; Allcoat & Von Mühlenen, 2018). Among the benefits for out-of-class learners that have been identified, Richards (2015) lists flexibility and convenience, a positive learning experience, the reflection of the learners’ needs and interests, and helping them to realise that they have a role in managing their own learning.

4.1 Learner autonomy and Language learning:

Classroom-based teaching and learning have been the focus of most of the research undertaken into language learning (Nunan & Richards, 2015), but learning activity outside the classroom is equally important (Richards, 2015) given that it can afford opportunities for exposure to language input and maintain motivation in learning (Lai, Hu & Lyu, 2018) and it shifts the focus from the teacher to the learner (Reinders & White, 2016), providing learning experiences that are authentic and opportunities for real communication with peers and speakers of the target language (Nunan & Richards, 2015). These learning experiences can undoubtedly lead to development in language acquisition: “if language learning depends crucially on language use, learners who enjoy a high degree of social autonomy in their learning environment should find it easier than otherwise to master the full range of discourse roles on which effective spontaneous communication depends” (Little, 2003, n.p.). It has been acknowledged that “non-formal and informal education plays a key role for language learning” (European Commission, 2012, p.16). Autonomous learning “has been found to be positively associated with both language learning gains and positive affective outcomes, such as enjoyment of and confidence in language learning, and the construction, experimentation and performance of multiple identities via varied and creative modes of self-expression in diverse online communities” (Lai, Hu & Lyu, 2018, p. 115). A key criterion for autonomous language learning to be successful is “the ability of learners to make the appropriate connections between their existing skills, knowledge and experience, and expected skill, knowledge and behaviors” (Clayton, Iwata & Saravani, 2016, p. 1340).

It is useful at this point to return to the concept of who the autonomous learner is, taking into consideration that what they are trying to learn is a language. There are many reasons to want to learn a language, from simply instrumental reasons such as passing an exam or improving job prospects to more integrative motivations such as wanting to live in an area where the language is spoken or being in a relationship with a speaker of that language. There is generally an assumption that language learners want to achieve fluency in their target language, but are also many different goals that a language learner may wish to achieve, whether it be a recently-arrived migrant needing very functional and quick phrases, learners wanting to grasp a few words for a trip, to greet business partners before moving on to a lingua franca, or exchange pleasantries with partners of family members, for example. In addition, not all learners

wish to focus on the four skills of reading, writing, speaking and listening, or not to the same standard. A learner may want to be able to interact with target language speakers but have no interest in being able to write formally; another may only be interested in reading texts in the target language and have no interest in listening comprehension or oral production. It is also important to consider that language learners may weave in and out of formal instruction, perhaps filling the gaps with autonomous activities, at different stages in their life and career, depending on their needs and circumstances. They may use tools such as their smartphone as a supplement to other learning or practice they undertake or make the tools their sole medium for language development. Cultural contexts of previous education and beliefs about what learning is and how it should be achieved will also play a part. This wide-ranging scope of types of learner makes autonomous language learning very complex to analyse and evaluate.

Language learners “increasingly craft learning experiences through multiple platforms and sites” (Sauro & Zourou, 2019, p. 5), making choices to devise their own environment, tools and resources for language learning. Being aware of and able to change those choices over time as their learning progresses is a necessary part of the autonomous learning process (Godwin-Jones, 2011). Among the many factors that affect autonomous language learning are: “the learner’s linguistic and educational background; the availability and suitability of chosen or found online resources; the learner’s motivation, knowledge, and ability to use and re-use the resources productively; and the degree to which the experience fits the learner’s self-concept in the present and for the future” (Godwin-Jones, 2019b, p. 8).

Understanding how autonomous language learning works has risen as a priority in the CALL agenda in the last few years: “well-rounded communicative proficiency, it seems, depends to a large extent on the learner’s efforts to use and learn the language beyond the walls of the classroom. For this reason alone, settings for language learning beyond the classroom deserve much more attention in research than they have received hitherto” (Benson & Reinders, 2011, p. 2). Benson (2013) called for a theory of second language learning beyond the classroom as a separate field from SLA. The use of mobile devices is clearly a key factor in this:

> Developments in technology—such as mobile devices that afford connection and social interaction anytime and anywhere, social networking offline and online, horizontal patterns of connectivity that allow users to create natural bonds based on shared interests—all offer possibilities for user-driven, self- and group- initiated practices that redraw models of production, distribution, and reuse of knowledge (Sauro & Zourou, 2019, p. 1).

4.2 CALL / MALL and learner autonomy:

Whilst the classroom was traditionally seen as the place for learning, the opportunities for language learning and practice that the advances in technology afforded by the internet have provided have grown enormously, facilitating and enabling autonomous learning outside a formal environment (Tan, 2013). The way autonomy is understood in relation to language learning has shifted from the more abstract concepts of abilities for taking charge of learning to "more specific abilities to navigate different (learning) environments, with technology playing an important facilitative role" (Reinders & White, 2011, p. 2). Whereas learner autonomy and CALL were seen as two separate domains, in the last 15 years they have begun to merge as their respective domains have evolved: technology has seen an increase in locations for learning and a greater range of pedagogies, and autonomy has seen a shift towards reduced formality and more learner control, making the relationship between them more complex but also more promising (Reinders & White, 2016).

Mobile technologies have increased the opportunities to support informal language learning (Hager & Halliday, 2006; Reinders & White, 2011; Godwin-Jones, 2011), and, due to their ubiquity, smartphones have been identified as having a central role in this (Park, 2011; Sharples, 2013; Chen, 2013). A unique characteristic of MALL is that it differs from CALL because of the use of personal, portable devices, and the new ways of learning they enable (Kukulska-Holme & Shield, 2008) and therefore "mobile learning seems to belong more to learners than it does to teachers" (Kukulska-Holme, 2019, p. 162), aligning it with autonomy.

Whilst the use of mobile technologies undoubtedly facilitates access to language learning in an autonomous manner, there are two main factors that are key to success

in achieving this: the quality of the resources available and the aptitude of the learner for autonomous learning. Lai, Hu and Lyu (2018) claim that identifying different types of technological resources to evaluate them can be misleading and suggest that it may be more productive to classify the different types of learner experiences that may be encountered in MALL. Their classification includes instruction-oriented, entertainment- and information-oriented, social-oriented, and creation-oriented experiences. The first three of these were found in interviews they carried out with undergraduate students in Hong-Kong. Instruction-oriented focus on learning grammar and vocabulary was positively perceived overall, although some learners found it boring. These experiences are described as conscious and intentional, easy to find, and recommended by teachers, peers and personal searches. Entertainment- and information-oriented experiences involve access to target-language resources such as films, music, podcasts, news, and social media postings by native speakers (mainly celebrities). The participants in their research reported better understanding of the target language and culture, colloquial language in particular. Social-oriented experiences involve interaction with native speakers through online messaging on social networking sites, forums and mobile applications such as Whatsapp. Only a small number of research participants engaged in this type of experiences and they reported a level of uneasiness using them due to concerns about their own language proficiency, artificial and stilted conversations, and the accuracy of native speakers' language use. An additional technological learning experience identified in their research was described as experiences for assistive purposes. These involve use of online dictionaries or translators to assist with the other activities. Finally, the authors suggest that higher-proficiency learners may also engage in a fourth type of experience, creation-oriented, focusing on the development of multimedia objects, presentations, and online contributions.

Lai, Hu and Lyu (2018) summarise three major findings of the research into autonomous language learning with technology: first, that learners regularly use a variety of technologies, mainly language-learning specific platforms such as online dictionaries, conjugation software, YouTube videos and mobile apps; second, that most of these resources focus on receptive skills; and third, that communication tools are the least used by formal learners out of class. They point out that learners may use the same technology in different ways for different purposes.

Benson (2007) called for a move from theoretical positions on learner autonomy to more empirical studies of the impact of factors such as age, gender, and culture. This call remains open with regards to MALL: as Reinders and White (2016) pointed out, the focus of autonomy research has remained on formal settings, partly because of the lack of understanding and recognition of learning outside formal settings. There is also a concern that learners will not be able to manage their own learning: “we know that most learners will struggle without a teacher’s direction and guidance” (Kukulska-Hulme, 2009, p. 162). There is “a failure to track actual MALL usage” (García Botero, Questier & Zhu, 2019, p. 73) which, as a result, means that “little is known about what users do when they download language software packages intended for self-study” (ibid). The MALL literature acknowledges that beyond learners’ usage patterns, it is important to research learner perceptions and motivation and the perceived usefulness of using the software they are using (García Botero, Questier & Zhu, 2019) as well as how students evaluate the technologies they use (Reinders & White, 2016).

The large number of MALL resources available for language learning purposes (whether designed as language learning tools or not) means that there is no shortage of different approaches to teaching, skills covered, opportunities for interaction, behaviourist drilling etc. Individual learners can make choices based on their preferences and goals. These choices range from which resources to use, to when, where, and how. Green, Facer, Rudd, Dillon and Humphreys (2005) identified four key areas that personalised learning with technologies pedagogy must have: ensuring that learners are capable of making informed educational decisions, recognising different forms of skill and knowledge, creating diverse learning environments, and including learner-focused forms of feedback and assessment.

In recent years, there has been a shift towards using Complexity Theory (CT) as a framework for understanding both SLA (Larsen-Freeman, 2007, 2011, 2013) and CALL, particularly in informal learning (Kusyk, 2017; Godwin-Jones, 2018, 2019a, 2019b). Complexity Theory (also referred to as Dynamic Systems Theory) is “a framework that allows for studying change in systems over time” (Kusyk, 2017, p. 78). All the different elements of a complex system are interconnected to different degrees, with some elements more stable and others more dynamic, and the context where this

complex system occurs is an important part. In second language acquisition, a field with many variables that are difficult to consider as a whole, the use of CT can help view the development of language as a complex system with its own elements, and the learner as a complex system that interacts with language development and complex contexts. Using CT shifts the focus from the evaluation of tools or interventions in given contexts with a particular set of learners that has traditionally been the focus of SLA and CALL research to looking at the whole system and the connections within it. Godwin-Jones (2018) argues that

> there are three characteristics of informal language learning that mesh well with a CT approach, namely the *nonlinear development path* (especially as compared to typical instructed language learning), its *self-organizational character* (L2 users and the Internet combine to create a unique, ever-evolving set of resources), and the *focus on emergent outcomes* (widely variable and unpredictable learning, often incidental in nature) (Godwin-Jones, 2018, p. 16).

Because autonomous language learning with mobile technologies is a complex system with interconnections between learners, content, tools, context, and language, where activities are not undertaken in isolation from the other elements, CT can be a useful theoretical approach to understanding it. This is based on measuring language acquisition over time, and the elements that have played a part in the changes that have occurred in the stage of language development that the learner has gone through, to discover patterns of language development rather than trying to establish the cause (intervention) of an effect (language acquisition). These patterns could then lead to the identification of best practices.

5 Evaluating technology for Language Learning purposes

At its most basic, evaluating technology can be reduced to the two main measures of the Technology Acceptance Model (TAM): ease of use, and usefulness. TAM, developed in the late 1980s (Davis, 1989; Davis, Bagozzi & Warshaw, 1989; Bagozzi, Davis & Warshaw, 1992), became a popular framework for evaluation of adoption of new technologies, mostly in the workplace. Although it attracted a number of criticisms, it remains popular as the basis of evaluation of technologies. Evaluating technology

for learning purposes is an essential part of CALL, given that the use of technology for language learning is far from a panacea for learning:

> At their best, technological innovations can increase learner interest and motivation; provide students with increased access to target language (TL) input, interaction opportunities, and feedback; and provide instructors with an efficient means for organizing course content and interacting with multiple students. At their worst, the use of new technologies can result in inappropriate input, shallow interaction, and inaccurate feedback; student frustration with software and hardware; distraction from the learning task; and a general over-emphasis on delivery modality over learning objectives (Golonka, Bowles, Frank, Richardson & Freynik, 2014, pp. 70-71).

Evaluation of educational technologies has been described as “the gathering of information about any of the variety of elements that constitute educational programs, for a variety of purposes that primarily include understanding, demonstrating, improving, and judging program value” (Norris, 2006, p. 579). Chapelle (2017) states that because evaluating CALL is so integral to the field, it is difficult to define exactly what it should consist of. Hubbard (2006) proposed that the evaluation of CALL should involve three processes: “(a) investigating a piece of CALL software to judge its appropriateness for a given language-learning setting, (b) identifying ways it may be effectively implemented in that setting, and (c) assessing its degree of success and determining whether to continue use or to make adjustments in implementation for future use” (313). Levy and Stockwell (2006) distinguish between evaluation and research, claiming that whilst evaluation focuses on whether the use of a tool has worked in a particular context, research focuses on the reasons why it has or has not worked. Stockwell (2012), adds that evaluation studies have a more practical outcome and are primarily decision-driven.

Chapelle (2017) makes the case for seeing the evaluation process as argument. She differentiates five types of argument put forward to support claims about CALL: comparative, authenticity, corpus linguistic, theory-based, and pedagogy-based. The comparative argument is based on quantitative research that compares learners’ performance in CALL environments with those that do not use any technology. Whilst this type of research has been very popular and the studies have provided many statistically-significant findings, Chapelle rightly points out that the assumption that a

classroom with no technology is the norm is no longer valid in most contexts nowadays. The authenticity argument is based on the claim that language-learning tasks should make use of the ways in which learners communicate and access information and entertainment outside the classroom, mainly on their mobile phones, as these are the tools that they are familiar and comfortable with. Whilst there have been some criticisms of this argument that claim that this should not be the basis for classroom-based instruction, Chapelle points out that it recognises the way language is medicated through technology outside it. The criticisms are perhaps applicable to formal language learning contexts, and it could be argued that they do not really apply in the context of informal learning. The corpus linguistic argument is based on the use of corpora to provide learners with access to linguistic data about the language they are learning, which is an area of CALL that is not relevant to informal language learning and the technologies being evaluated in this thesis. The theory-based argument is based on CALL theories about the ideal conditions for learning through technology and how these are met by the different uses of the different technologies available, with the theory being used to explain the reasons why one is considered better than others in certain conditions. Finally, the pedagogy-based argument is based on whether technologies meet generally-accepted teaching principles usually gained from previous research. Chapelle states that these arguments are not the only ones or mutually exclusive, and argues that perceiving the evaluation process as argument not only maintains the context specificity of different arguments, but also takes into consideration the different types of audience that wish to use the evaluation findings: learners, teachers, researchers, funders and institutions.

A number of frameworks for the evaluation of CALL software have been proposed by a variety of researchers, each with different characteristics and taking different criteria into account. Typically, three approaches are used in CALL software evaluations: checklists, methodological frameworks, and SLA-based approaches (Levy & Stockwell, 2006). Hubbard's 1996 framework for evaluation contained three elements: teacher fit (how well the tool fits the approaches about how language is learnt chosen by instructors), learner fit (design issues including tasks, materials and goals), and operational description (the procedure for the implementation of the goals). McMurry, Williams, Rich and Hartshorn (2016) proposed an evaluation framework which consists of a process of identifying the evaluands and stakeholders, set criteria and

determine the purpose and type of evaluation, which in turn leads to developing the evaluation questions, data collection and reporting of findings and implications. Other frameworks are much more specific. For example, Murray and Barnes (1998) created a checklist which included the provision of meaningful input, context, practice, authenticity, culture, assessment and feedback, activity types, use of media, design, curriculum fit, integration into the classroom, instructions and support. A later evaluation framework by Jamieson, Chapelle and Preiss (2005) contained six criteria: language learning potential, learner fit, meaning focus, authenticity, positive impact, and practicality. A framework that has gained traction lately is TPACK (Technological, Pedagogical and Content Knowledge) (Mishra & Koehler, 2006), based on Shulman's (1987) Pedagogical Content Knowledge framework. TPACK considers context, teacher, resources and professional development levels as key interlocking factors in effective integration of technologies in a formal setting.

In the context of mobile learning, the iPAC framework (as described by Koenraad, 2019), based on the model for mobile learning proposed by Kearney, Schuck, Burden and Aubusson (2012), identifies three 'signature pedagogies' which make learning through mobile devices distinctive: personalisation, authenticity, and collaboration. These pedagogies in turn have seven 'sub-constructs' between them. Personalisation includes the agency and customisation sub-constructs, which allow learners to set goals and make choices to tailor the learning experience to their individual needs. Authenticity includes three sub-constructs: setting, task, and tool. The setting can be physical or virtual and allows situated learning to take place; tasks can be more or less authentic depending on how realistic they are; and tools refers to the devices and software that learners use and how similar they are to those used in the real world. The third signature pedagogy is collaboration, which includes the conversation sub-construct, which allows negotiation of meaning, and data sharing, which affords the production, consumption and exchange of information and resources. The seven sub-constructs are used to evaluate how learners use a mobile technology whilst undertaking a learning activity by measuring where the activity falls within a spectrum of short questions provided by the framework developers (available at MobileLearningToolkit.com).

A framework for the evaluation of the learning design of mobile language learning resources was proposed by Reinders and Pegrum (2017). They identify five categories for evaluation: the affordances that the device offers, general pedagogical approaches (from traditional approaches such as behaviourism to more progressive ones such as socio-constructivism), L2 pedagogical approaches (such as communicative, task-based, or intercultural), SLA principles (e.g. noticing, comprehensible input and output, negotiation of meaning), and affective principles like engagement and motivation.

An additional factor in the evaluation of technologies for learning is going beyond the "wow" factor (Murray & Barnes, 1998), that is, acknowledging that a new way to do something may provoke initial positive reactions that have to do with the novelty rather than the true value of the technology. An awareness of this 'wow' factor should help evaluators to be more objective.

It is important to remember that much of what has been written in terms of evaluation of CALL referred to the evaluation of single packages (e.g. CD-ROMs) to be used as part of a teacher-directed activity, mostly in a language lab, in an extensive manner and over a relatively long period of time. The evaluation of podcasts, apps and Twitter does not fit with the same criteria. These technologies are used mostly autonomously for short periods of time, and are part of an array of tools and resources that language learners have at their disposal mostly through their smartphone. These considerations will be explored in section 7, where the research questions for this thesis are outlined.

6 Six useful concepts

Despite the identified potential of podcasts, apps and Twitter for language learning purposes and their fit with theories knowledge acquisition, SLA, and MALL as described above, a number of factors need to be considered in the evaluation of their effectiveness as tools for both language learners and teachers. My research presents the potential of these tools and looks into their adoption based on a series of studies with a range of users: formal learners, informal learners, and teachers to try to ascertain whether there is sufficient evidence of learning and positive perceptions towards the tools as facilitative of language learning. Six concepts are part of the

factors that affect this research: the concept of teaching strangers, the development of digital capabilities, micro-credentialing, the rise in continuous partial attention, foreign language anxiety, and normalisation.

6.1 Teaching Strangers

A useful concept to frame the design and evaluation of online language learning resources is that of 'teaching strangers', a term coined by Panter (2010) to refer to the issues that school and university librarians face when asked for advice by a student as they do not know the student's familiarity with the subject or their academic ability, for example, which makes it difficult to advise them. Teachers in a traditional education setting usually know their students: whether they fall into the typical demographic for their institution, their socio-economic background, cultural make-up, previous knowledge of the subject, learning preferences etc., and they use or design appropriate resources taking these circumstances into consideration. This becomes more challenging when designing courses for distance learning. Distance learning organisations have dealt with this by using a pedagogical approach to materials design that is as flexible and accessible to a wide audience as possible, but they also have access to data about their students, feedback from student surveys, previous performance, and research into distance learning design that can inform their decisions.

The rise in open practices such as the provision of Open Educational Resources (OER), MOOCs, or podcasts has created opportunities for learning resources to find new audiences. These audiences will hopefully be the people that the learning designers and providers intended to reach, but they may include a range of people that do not fit with the intended audience. These providers are therefore "teaching strangers". When developers create materials for autonomous language learning through podcasting, apps or social media (among others), their resources – despite their level of production values – may not be appropriate for the learner. The materials they designed for an intermediate student may put off a beginner, or be considered too easy for a more advanced learner. The author's pedagogical beliefs about what makes "good" learning materials may vary immensely in a different context.

Related to this is the idea that learners will use technology in the way it was intended: “just because a device can be used for something it doesn’t mean it will be used for that purpose” (Bell, 2008, p. 182). Because “learners will often do things that are not expected (…) and at the same time not do things that are expected” (Stockwell, 2012, p. 3), research into autonomous language learning online needs to take into consideration what learners do but also that the learner is a ‘stranger’, and therefore evaluating this type of autonomous activity requires information about the learner and what they do being collected.

6.2 Digital Capabilities

This links with the second concept underpinning my research: digital capabilities (also referred to as digital competence or digital literacy). The concept of digital literacy has evolved in the last 25 years. It was initially referred to as ‘e-literacy’ (Kaplan, 1995), and referred to “the knowledge and skill required to make marks in electronic age with electronic devices” (p. 11). This included alphabetic literacies, “at least a rudimentary grasp of a computer's interface” and “some specialized knowledge for issuing computer-readable commands to save a document, print it, send it out over a network and the like” (ibid). Going beyond the ability to find and store information, Gilster (1997) and later Reinhardt and Isbell (2002) added a critical aspect. Reinhardt and Isbell (2002) defined what they termed ‘Web Literacy’ as “the technical, critical, and analytical skills users need to effectively locate and evaluate online information according to their personal or academic needs” (p. 3). Much has been written about what digital literacies involve (see Goodfellow, 2011 for a review), but a fairly comprehensive definition is offered by Ferrari, Punie and Redecker (2012), who use use the term ‘digital competence’ to refer to

> the set of knowledge, skills, attitudes, strategies and awareness which are required when ICT and digital media are used to perform tasks, resolve problems, communicate, manage information, collaborate, create and share content, and build knowledge in an effective, efficient and adequate way, in a critical, creative, autonomous, flexible, ethical and a sensible form for work, entertainment, participation, learning, socialization, consumption and empowerment (pp. 2-3).

It is worth mentioning the often-used term ‘digital natives’ here. In 2001, Prensky divided digital users into digital natives (born at a time when digital tools already

existed and therefore exposed to them from an early age) and digital immigrants (people born before then). According to Prensky, digital natives had certain abilities, practices and expectations of digital tools which digital immigrants did not, and digital immigrants were therefore judgmental of the natives' practices and beliefs about the use of technology in education. The term is still widely used, yet this division of digital natives and immigrants is unsuitable for many reasons: first, it assumes a set of abilities based on age. Second, it assumes that being exposed to a technology means that so-called natives know how to use it. Third, it assumes that being able to use a technology means that the user knows how to exploit it for educational purposes. Fourth, it assumes that so-called digital immigrants can neither use nor see the potential of technologies for education. Kirschner and De Bruyckere (2017) provide many examples of scientific evidence that supports that these assumptions are not true, and posit that the differentiation is therefore not helpful. Pegrum' s (2014) classification of learners as either 'tech-comfy' (able to use technology for social and entertainment purposes) or 'tech-savvy' (able to evaluate and use technologies also for professional and academic purposes) is much more helpful than the digital native / immigrant concepts, as it is based on ability.

Digital capabilities remain an area worthy of investigation, and some attempts have been made to categorise and evaluate the different skills required to be an effective digital user. A number of frameworks for evaluation of digital competence have been proposed. The Joint Research Centre at The European Commission developed the European Digital Competence Framework for Citizens (known as DigiComp) in 2013, with a revised version in 2016. The framework has five competencies: information and data literacy, communication and collaboration, digital content creation, safety, and problem solving. Another framework proposed by JISC (2019) consists of six elements: ICT / Digital Proficiency (functional skills); Information, data and media literacies (critical use); Digital creation, problem solving and innovation (creative production); Digital communication, collaboration and partnership (participation); Digital learning and development (development); and Digital identity and wellbeing (self-actualising).

Any research into how learners use technologies to provide, enhance or support their language learning activity needs to take into account their levels of digital capability.

In the case of the three technologies that this thesis investigates, it is generally assumed that users know how to utilise them, but whether they know how to make use of them for language learning purposes is one of the questions that this research aims to answer.

6.3 Micro-credentialing

Micro-credentials (also known as digital badges) are a "digital credential that represents skills, interests and achievements earned by an individual through specific projects, programmes, courses or other activities," (Alliance for Excellent Education and Mozilla Foundation, 2013, p. 2). These are provided in the form of an image which usually displays what the achievement is and the name of the organisation that has awarded it. Many badges have a hyperlink to a site which provides evidence of what criteria were met to obtain the badge. Learners can display their badges online in e-portfolios, websites, or social networking sites such as Facebook or LinkedIn.

Badges first became available in 2011 through Mozilla's open badge infrastructure (https://openbadges.org/). Since then, they have become increasingly popular and are awarded to represent many types of achievement by a wide-ranging variety of organisations. Weller (2020) remarks that badging was enabled by a confluence of several technologies, including social media (developing and sharing identity and achievements), e-portfolios (showcasing digital outputs), gaming (showcasing rewards), and OER and MOOCs (which led to a desire to have informal learning recognised). As well as functioning as indicators of achievement, some researchers claim that micro-credentials can help to motivate learners (Clayton, 2012; Law, 2015) and enhance learner autonomy (Iwata, Wang & Clayton, 2019). An issue that still creates a barrier for the wider use and acceptance of micro-credentialing is credibility (Davis & Singh, 2015): while learners recognise the value of being able to document their informal learning, many employers and educational institutions are still doubtful of their legitimacy. Still, there is a growing number among informal learners who wish to accredit their learning in some form (Law, 2016).

A categorisation of open badges by Hickey (2012), presents four functions of micro-credentialing: recognising, assessing, motivating, and evaluating learning. All four

functions can be achieved through apps. Language learning apps such as Duolingo produce badges that the user can share after completing a number of levels. This can act as a motivation to complete the levels, assesses the learners, allows them to evaluate their degree of learning, and their learning can be recognised externally. Twitter can be a place where badges are shared too.

6.4 Continuous partial attention

An issue that affects engagement with any learning activity that takes place on a mobile device is the constant demands on the user's attention. The mobile environment is one where distractions such as notifications from messaging, social media, email, or apps are constant unless managed. Friedman (2006) referred to a shift from "the age of information" to "the age of distraction" (n.p.), and Kenning (2007) described the mobile learning experience as one that could be "a highly fragmented experience liable to be fraught with distractions" (p. 194).

Continuous Partial Attention (CPA) is the process of paying simultaneous attention to a number of sources of incoming information, but at a superficial level (Stone, 2009). Foehr (2006) defined continuous partial attention as "'media multitasking,' or engaging in more than one media activity at a time" (p. 1). This has led some to categorise CPA as a type of multitasking (Rosen, 2008); Media multitasking is different from continuous partial attention, however. Whereas multitasking refers to engagement with more than one activity, CPA refers to the lack of full engagement. Rose (2006), claims the difference lies in the motivation for these. Whereas multitasking is motivated by the desire to achieve more in less time, CPA arises out of the desire to stay connected. Stone (2009) suggests that the main reason people are in a state of CPA is because they do not want to miss anything.

Some have argued that CPA has "particularly serious implications for online learning" (Rose, 2006, p. 45). Stone (2009) adds that although CPA can be "a very functional behavior", it can also generate stress and "a compromised ability to reflect, to make decisions, and to think creatively" (n.p.). There is not much research into how CPA

affects informal learning from mobile devices – it is a fairly clear case of 'how much' rather than 'if', but there has been some research into the effect of media multitasking on cognitive functioning (Wilmer, Sherman, & Chein, 2017) and academic performance (Fox, Rosen, & Crawford, 2009; Calderwood, Ackerman, & Conklin, 2014; van der Schuur, Baumgartner, Sumter, & Valkenburg, 2020). Rose (2006) proposes that there are two ways to address the issue. One would be to keep upping the ante with flashier, more attention-grabbing designs in the hope to maintain the learner's attention (until something even flashier comes along). The other is the design of materials that make the learner aware of their own attention and how it is dispersed and help them to monitor and regulate it.

6.5 Foreign Language Anxiety

Foreign language anxiety has been defined as "a distinct complex of self-perceptions, beliefs, feelings, and behaviours related to classroom language learning arising from the uniqueness of the language learning process" (Horwitz, Horwitz & Cope, 1986, p. 128), or, more simply, as "the worry and negative emotional reaction when learning or using a second language" (MacIntyre, 1998, p. 27). It is a phenomenon that affects language learners, who often have to produce target language with little or no time to rehearse or think their output through (Horwitz et al., 1986; Price, 1991). Learners may feel apprehensive, uncertain, frustrated or shy (Guiora, 1984) about their performance and knowing their output will be evaluated by a teacher, fellow learner, or native speaker depending on the situation. These feelings are not limited to producing output: fear of being unable to understand what is being said can also trigger anxiety. Young (1994) identified three sources of foreign language anxiety: learners, teachers, and instructional practice. Foreign language anxiety has been linked to proficiency in the target language (MacIntyre & Gardner, 1991), but while it is true that anxiety tends to decrease as the learners' level of proficiency increases, advanced learners can also feel anxiety (Marcos-Llinás & Garau, 2009). As Tóth (2007) pointed out, whilst many have interpreted foreign language anxiety to be the cause of poor achievement in language learning, it can also be interpreted the other way around: that poor achievement can be the cause of anxiety. Because of this, it is probably more useful to think of foreign language anxiety as a cyclical phenomenon where both anxiety and

performance (along with other factors) interplay (Horwitz, 2010). Among the different activities in language learning, reading comprehension has been identified as the least anxiety-provoking (MacIntyre, Noels, & Clément, 1997) whilst speaking has been identified as the most anxiety-provoking (Koch & Terrell, 1991; Young, 1999).

It has been argued that computer-mediated communication can ease the level of foreign language anxiety, as interlocutors can hide behind a screen, an avatar, a username, or simply because they do not know the person they are speaking with (Rosell-Aguilar, 2005; Satar & Özdener, 2008; Keipi, Oksanen & Räsänen, 2015). Studies by Reinders and Wattana (2015) and Melchor-Couto (2016) showed that language learners exhibited lower anxiety when performing oral interaction activities in virtual world contexts such as Second Life and Multiplayer gaming than they did in a traditional classroom context. Despite her previous research showing that learners in Language MOOC environments found computer-mediated interactions less stressful than face-to-face communication (Bárkányi & Melchor-Couto, 2017), Bárkányi (2018) found that anxiety was one of the main reasons why learners who were studying Spanish in an LMOOC did not upload recordings of their output.

With regard to the three technologies that concern this thesis, there is potential in all of them to allow the learner to experience language learning opportunities with decreased anxiety: listening to target language podcasts allows the learner to access input in a safe environment where they can listen as many times as they need and reduce the speed at which the input is played; completing grammar exercises using an app affords the learner a space where they can make mistakes without public exposure; and on Twitter then can access short texts in the target language that they can look up, and take time to compose and check any texts they wish to post.

6.6 Normalisation

Finally, the sixth concept is that of ‘normalisation’ of technologies in education (Bax, 2003, 2011a), that is, the point at which the use of a technology becomes so normal to the learner that it goes almost unnoticed. According to Bax (2011a), the normalisation process typically consists of six steps: early adoption by curious users, ‘try once’ and reject, a ‘fear’ stage, ‘try again’, awe (or the ‘Wow” stage), and

normalisation. This does not mean that all users will follow those stages or indeed that all technologies should or will be normalised by everyone.

The concept of normalisation has been accepted as useful by a number of researchers: “Language teachers are very much working within a complex system of opportunity and constraint. Normalization then becomes a process of understanding the infrastructure, the support networks, and the materials, and working effectively within them” (Levy & Stockwell, 2006, p. 234). In her review of the role of technology in SLA, Chun (2016) suggested that practice in language teaching, learning and research was approaching normalisation of technology. However, before a technology is considered normalised, research must first provide evidence of how the technology is used and whether learning takes place, as Bax stated, “before we can be sure that any technology has become fully normalized in any particular educational setting, we need first to research whether the resource is in fact serving the ends of learning in a fully integrated and therefore seamless, normalized way” (Bax, 2011a, p. 246). Bax (2011b) also argued that an explanation of normalisation that depends on single events or actors should be avoided, and instead it should be considered within a sociocultural environment where learners use technology to scaffold their language learning. Levy and Stockwell (2006) differentiate between normalisation at individual level and institutional level: whereas for the individual it is normally the case that they adopt a technology because they perceive it to be useful to them and can afford it, at institutional level this is much less personalized and the adoption of a technology is seen as something that will benefit all students and the cost at that scale requires careful evaluation before committing to its purchase.

Bax proposed that the concept of normalisation can be helpful in understanding why certain technologies succeed or fail, but in his work he limited the impact of normalisation to formal learning environments and argued for the role of the instructor as someone who can offer interventions that technology cannot. In my work I will use the concept of normalisation to discuss the integration of podcasting, apps and Twitter as language learning tools for the autonomous learner.

7 Aims and Methods

The overarching aim of the different research studies presented in this thesis is to evaluate the three technologies through a process of a) identifying the potential of those technologies, b) investigating how they are used by learners and (where applicable) teachers, and c) analysing whether the way they are used meets the identified potential and is conducive to language learning (Figure 2): “many teachers and researchers in applied linguistics want to learn how students and teachers work with language learning through technology, what they think of particular types of tasks, and what kind of challenges they face when undertaking innovation” (Chapelle, 2017, p. 381). It can be safely assumed that using a technology designed for learning will lead to some development in the learner’s knowledge or skills. How much learning and how individual differences and context affect this development are the key issues, given that the same technology may well provide a very different learning experience to different users: “the primary research question is not whether multimedia instruction is effective, but rather under what conditions and for whom” (Chun & Plass, 1997, p.72). The inclusion of the student voice in the evaluation of teaching and learning has gained momentum worldwide for the last 20 years (Manca, Grion, Armellini & Devecchi, 2017) with calls for more research onto the student experience from a variety of authors (Menezes, 2011; Stockwell, 2012; Bartram, Bradley, & Al-Sabbagh, 2018).

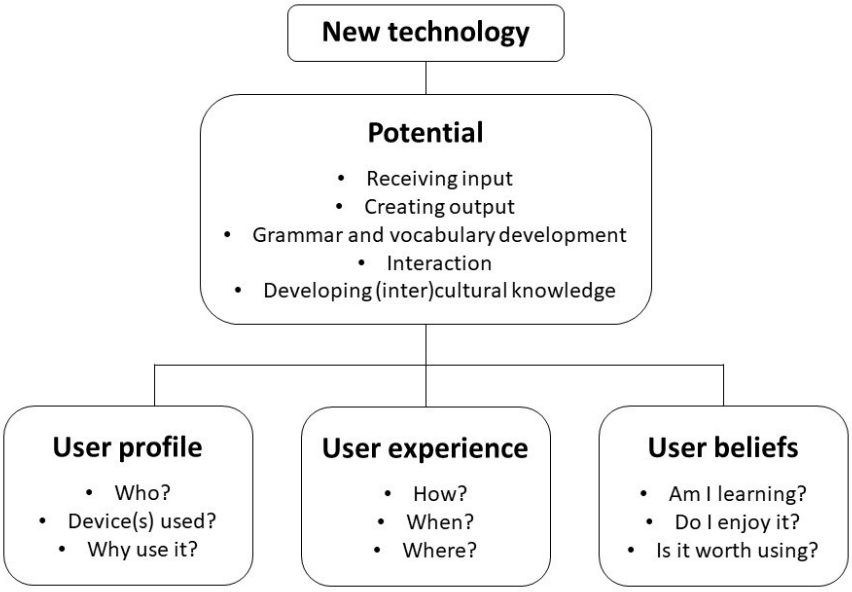

Figure 2: Technology evaluation steps followed in this research

However, most evaluations reported in the research literature have taken place in academic contexts and not focused autonomous learning. The wide ownership and use of smartphones present many opportunities for language learning, but “although ICT can enable new forms of teaching and learning to take place, they cannot ensure that effective and appropriate learning outcomes are achieved” (Kirkwood & Price, 2005, p. 260). Knowing how to use a mobile device for communication, gaming, or information gathering does not imply that the user knows how to use it for learning purposes. As Stockwell and Hubbard (2013) highlight, the primary function of mobile devices is for personal use, and learners “may not perceive their mobile devices as appropriate vehicles for learning” (p. 4) or indeed want to use them for that purpose. The variety of situations in which MALL is used has led to a call to research existing practices in MALL and include the perspectives and attitudes of learners using mobile devices in both formal and informal contexts (Gimeno-Sanz, Morgana & Van de Vyver, 2020). In formal settings, the teacher or instructor would usually monitor student use of a technology to ensure that students are using it in the way they envisaged. In the context of autonomous learning, learners may be using the technologies in ways that their designers did not envisage (Stockwell & Hubbard, 2013)

Another issue concerning the evaluation of technologies for learning that is important to include here is technological determinism. It is easy to be excited and curious about what learning opportunities a technology can afford, but sometimes this leads to technology - rather than pedagogy - driving their introduction to teaching practices (Conole, 2008). In the realm of mobile autonomous learning, however, the lack of a teacher and the fact that the mobile device is the main tool for learning means that learning is technology-driven, and this means that evaluation of technologies is key to evaluating the learning experience. Discussing technologies such as Virtual learning environments and virtual worlds, Bax stated that "…although these technologies offer great potential to teachers and learners in terms of allowing greater access to resources and more dynamic opportunities for interaction and communication, their benefits in terms of genuine learning must not be taken for granted. The potential role of each technology in each setting needs to be researched in detail" (Bax, 2011a, p. 247). That is, before considering whether a technology is normalised, evidence needs to be gathered on how users utilise the technology and whether (and how much) learning happens.

Evaluating the effectiveness of a particular technology, resource or activity for autonomous language learning is complicated by the fact that learners will use it in different ways, for different purposes and in different contexts. This is an issue even in formal education: "the context is an extremely complex combination of factors, including the learners, the mode of instruction, the learning goals, the institutional environment, the experience and policies adopted by the teacher and so forth" (Stockwell, 2012, p. 3). In autonomous mobile language development, the technology will most likely be used in addition to other resources, and how that new technology fits with those other components will depend on the learner's level of development, which Godwin-Jones (2019b) claims is seen as a process of self-regulation "in which successful learners will have the willingness and ability to "reassess, revise, restart, reinvent" (Moyer, 2017, p. 401) when encountering new learning options" (Godwin-Jones, 2019b, p. 11).

Autonomous language learning has been the focus of many theoretical publications, but fewer research studies. Possible reasons for this are that:

- it takes place outside formal tuition and therefore it is something that researchers do not have easy access to,
- it occurs over a long period of time,
- it is not formally documented,
- learners are not enrolled on a course, so it is hard to identify them,
- due to the various and varied sources of learning, it is hard to provide evidence that the use of one tool in particular made a contribution to the learning process.

The methods used in the research reported in this thesis have provided tools to overcome some of these difficulties, as explored below.

7.1 Overarching research questions

As discussed in section 1, the evaluation of technologies for language learning can be undertaken following a number of theoretical frameworks. The different research projects presented in this thesis do not follow a single theoretical framework. Following Chapelle's concept of evaluation as argument, evaluation in this case is based on an overlap of authenticity, theory-based, and pedagogy-based arguments. My research into language learning with technologies has focused on the evaluation of the affordances of tools and how learners use them. In the process, I have researched the development of digital literacies and how learners use online resources for language learning purposes (Rosell-Aguilar, 2003; 2004), the design and use of online synchronous computer-meditated communication using audio and graphic-enhanced conferencing tools (Rosell-Aguilar, 2005; 2006; 2007), the affordances and use of podcasting for language learning purposes (Rosell-Aguilar, 2007; 2009; 2013a; 2013b; 2015a; 2015b), the design, implementation of design and evaluation of mobile apps for language learning (Rosell-Aguilar, 2016; Rosell-Aguilar & Kan, 2016; Rosell-

Aguilar, 2017) and the use of Twitter as a language learning tool (Rosell-Aguilar, 2018a; 2018c; 2018c; 2020).

From the very beginning, a central belief behind all this research is that “before we can evaluate the effectiveness of a tool, we need to know how the tool is used” (Rosell-Aguilar, 2004, p. 213). For this reason, although the research carried out has focused on different technologies, the overarching questions have remained the same throughout all of it and can be summarised as follows:

- Who uses the technology for language learning purposes?
- How do they use it?
- Does the use of the technology lead to learning?

These questions can be found in publications 2, 3, 5, 6, 7, and 9. Publication 8 offers a different angle by focusing not on language learners, but on language teachers and how they use Twitter for their own professional development. This is something that had been identified as a gap in the knowledge of professional development on social media (Veletsianos, 2017).

7.2 Methods

A variety of quantitative and qualitative methods have been utilised for the research studies described in this thesis, which are presented in publications 2, 3, 5, 6, 8 and 9 (as publications 1, 4 and 7 do not report on any new research):

Publications 2 and 3 used the data gathered through the same survey, albeit using different clusters of respondents and different foci of analysis. The large-scale survey was hosted on Surveymonkey and a link to it placed on the iTunes U site. Of the 2129 initial respondents, 455 (24.1%) were language learners and 1436 (75.9%) were

learners of other subjects. The statistical analysis was carried out using SurveyMonkey's own statistical analysis tools and SPSS.

Publication 5 used a mixed methodology approach with quantitative and qualitative methods. The quantitative element was in the form of a paper-based questionnaire with 27 items which was given to 165 students taking a languages degree, of which 85 (51.5%) completed and returned the survey. The questionnaire had been piloted the previous year with a different cohort of students taking the same course, and their responses and comments helped to refine the design of the final survey. The data obtained from the questionnaire was subsequently input into digital form for statistical analysis. The qualitative element consisted of seven face to face interviews with volunteers who had already responded to the survey. The interviews were approximately 15 minutes long, recorded with the students' permission, and transcribed and coded to allow a thematic analysis.

The survey from Publication 5 was then repurposed for use in the research reported in Publication 6. As this was aimed at non-formal learners, some adaptations had to be made to the question set. The revised survey consisted of 30 items including multiple choice and open questions, and was produced in two languages (English and Spanish). To ensure that the respondents were users of the *busuu* app, the call for participants was delivered exclusively as an in-app message from the app itself. The results from the 4095 respondents were analysed using Online Survey's descriptive statistics tools and SPSSv21 for the ANOVA and Honest Significance Differences (HSD) tests. The responses to the open questions were analysed following Braun and Clarke's (2016) thematic analysis process: reading once without coding for general impressions, reading a second time and coding, and reading a third time to check the coding.

Publication 8 used a mixed methods approach: the tools involved in this research were a survey with 22 questions (17 closed questions and 5 open questions), interviews with teachers carried out by direct message on Twitter, and a prototype tool to collect

Twitter data (*Humabird ScriptScrape*). The survey gathered 116 valid responses and 11 teachers were interviewed. Given the exploratory nature of the research, only descriptive statistics were used for the closed questions. The open questions were analysed using the same thematic analysis process as publication 6. In terms of methodology, publication 8 was the most innovative as it featured a new method developed for this piece of research and – to my knowledge – never used before: the Twitter Direct Messaging interview protocol. The process involved in carrying out these interviews and the identified advantages of this method are presented in Figure 3, and it is the ideal tool for research into Twitter use as it is ethnographic in nature, using the medium being researched as the research tool.

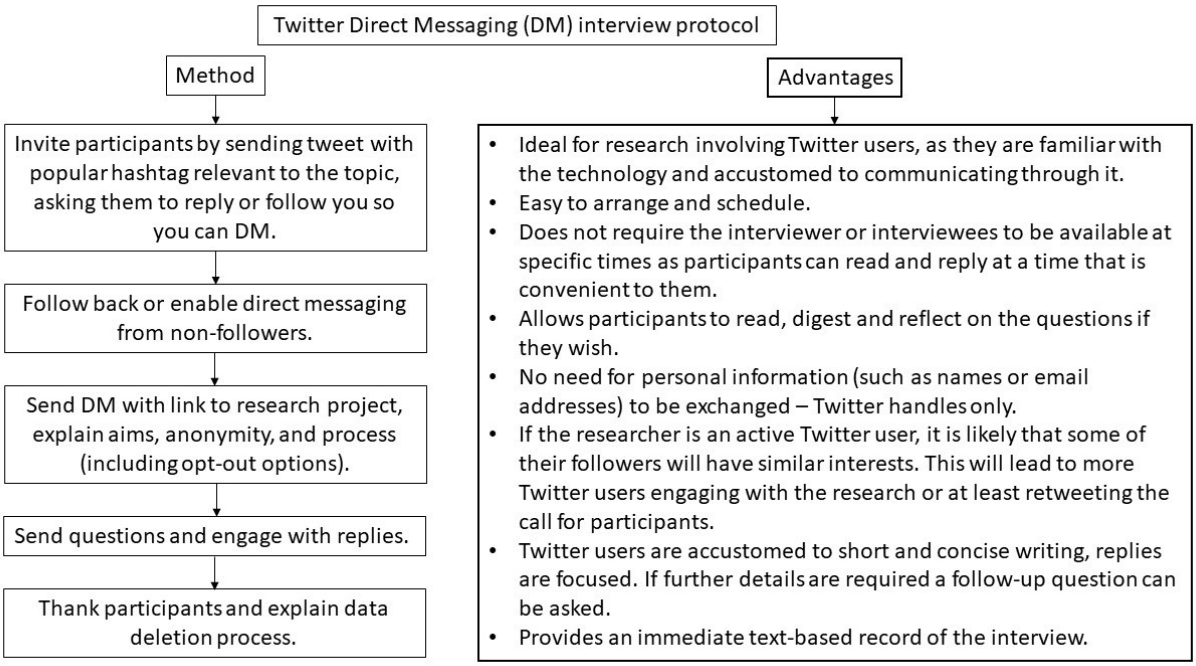

Figure 3: Twitter Direct Messaging Interview Protocol (Rosell-Aguilar, 2018d).

The only data collection method used in the research presented in publication 9 was a 30-item survey with 27 multiple-choice questions and 3 open questions. The first version of the survey was piloted with ten volunteer Twitter users, who provided feedback on the items and how long it took them to complete. Their responses also helped to generate multiple choices for questions that were originally open in the pilot survey, therefore allowing automated statistical analysis. To widen the number of potential respondents, the final survey was produced in English and translated into

Spanish, French and Italian. Links to each survey were tweeted in the corresponding language with relevant hashtags in that language, and some members of my own network of language teachers in areas where those four languages are spoken were asked to retweet or share the link among their own networks. Unsurprisingly, the English language survey received the most responses (289), followed by Spanish (81), French (26) and Italian (5). The survey was hosted on OnlineSurveys.ac.uk, which has servers in the UK and is therefore compliant with recent data protection and storage directives. The data collected were analysed using the survey site descriptive statistics tools and were further analysed with SPSSv21, although this part of the analysis was not included in the final version of the paper due to space limitations.

8 Thesis Outline

Following this introduction, the main body of the research will be presented in chapter two. This chapter consists of three separate sections, with three manuscripts dedicated to each technology. Section one will focus on podcasting, section two on mobile applications, and section three on Twitter. Each manuscript has been previously published in a peer-reviewed journal or book between 2007 and 2020. As a result, some of the early sections may seem dated in terms of the literature review and the affordances of the technology, which may have undergone changes since the chapter's publication. This is addressed further on in chapter 3, in which the contributions to the fields of CALL and MALL from the findings of the research will be presented, together with the impact that the research has had so far. Chapter 4 is the conclusion, which brings together the themes of the different research projects and links them to the concepts presented in this introduction. The conclusion will also present some predictions about the direction of technology-enhanced language teaching and the research into it. Finally, the thesis concludes with a list of the works referenced.

Chapter 1: Introduction

Chapter 2: Published works

Section I: Podcasting as a language learning tool

Publication 1: Top of the Pods - In Search of a Podcasting "Podagogy" for Language Learning. Originally published in 2007 in *Computer Assisted Language Learning*, 20 (5), 471 – 492.

Publication 2: Podcasting for language learning through iTunes U: the learner's view. Originally published in 2013 in *Language Learning & Technology*, 17(3) pp. 74–93.

Publication 3: Podcasting as a mobile learning technology: a study of iTunes U learners. Originally published in 2015 in the *International Journal of Mobile and Blended Learning (IJMBL)*, 7 (1), pp. 41-60.

Section II: Mobile apps for language learning and teaching

Publication 4: State of the App: a taxonomy and framework for evaluating language learning mobile applications. Originally published in 2017 in *The CALICO Journal*, 34 (2), 243-258.

Publication 5: User evaluation of language learning mobile applications: a case study with learners of Spanish. Originally published in 2016 in A. Palalas & M. Ally (Eds), *The International Handbook of Mobile-Assisted Language Learning*, (pp. 545-581), Beijing: China Central Radio & TV University Press.

Publication 6: Autonomous language learning through a mobile application: a user evaluation of the *busuu* app. Originally published in 2018 in *Computer Assisted Language Learning*, 31(8), 1-28.

Section III: Twitter as a language teaching and learning tool

Publication 7: Twitter as a formal and informal language learning tool: potential and evidence. Originally published in 2018 in F. Rosell-Aguilar, F., T. Beaven, & M. Fuertes-Gutierrez (Eds). *Innovative language teaching and learning at university: integrating informal learning into formal language education*, (pp. 99-106).

Publication 8: Twitter: a professional development and community of practice tool for teachers. Originally published in 2018 in *Journal of Interactive Media in Education*, 2018(1).

Publication 9: An evaluation of autonomous learner use of Twitter as a language learning tool. Originally published in 2020 in *International Journal of Computer-Assisted Language Learning and Teaching*.

Chapter 3: Discussion of results: contributions to the field and impact of the research carried out.

Chapter 4: Conclusion

References

Note:

All published works are reproduced here as “author accepted manuscript” versions with permission from the publishers.

Chapter 2: Published works

Section I:

Podcasting as a language learning tool

Publication 1:

Rosell-Aguilar, F. (2007) 'Top of the Pods - In Search of a Podcasting "Podagogy" for Language Learning', *Computer Assisted Language Learning*, 20:5, 471 - 492

Abstract

The popularization of portable media players such as the *iPod*, and the delivery of audio and video content through content management software such as *iTunes* mean that there is a wealth of language learning resources freely available to users who may download them and use them anywhere at any time. These resources vary greatly in quality and follow different approaches to learning. This paper provides a taxonomy of podcast resources, reviews materials in the light of Second Language Acquisition (SLA) theories, argues for better design, and outlines directions for future research.

1 Introduction

A cartoon on the (UK) Times Newspaper on 5/5/2006 shows two drawings: under the heading “University lectures then”, one is of an elderly man, in jacket and bow tie, reading from notes; next to it, under the heading “University lectures now”, a student in a t-shirt and cap is sitting, smiling, listening to his portable media player. Whilst most would agree that the depiction is currently not and may never be an accurate representation of Higher Education teaching, it does show that universities are perceived to be moving on with the times and that podcasting has a place in education.

What is podcasting? The definition on Wikipedia (July 2006) states that a podcast is

> the method of distributing multimedia files, such as audio programs or music videos, over the Internet using either the RSS or Atom syndication formats, for playback on mobile devices and personal computers. The term podcast, like 'radio', can mean both the content and the method of delivery.

The fact that podcasting uses RSS is what differentiates it from simple downloading or streaming. The use of RSS, or Really Simple Syndication, means that the user can subscribe to a podcast that will be downloaded automatically every time there is an update or new content is uploaded. A podcast is also different from a Webcast, which is a live feed normally accessed on the computer. The major difference with traditional internet audio or radio broadcasts is that podcasts can be listened to when and where the user chooses to, and that they are automatically delivered to subscribers (Diem, 2005; Sloan, 2005).

The word podcast is a combination of the words *iPod*, probably the biggest selling portable media player, and *broadcast*; but as Kaplan-Leiserson (2005), Campbell (2005), and Meng (2005) indicate, the use of the stem *pod-* is misleading, since podcasts are usually in mp3 format which can be played by a number of portable media players, computers, and stereo systems and not just the *iPod*. The term *Vodcasting* (the "Vod" stands for "video-on-demand") was used to refer to podcasts with video rather than audio content but this is now generally referred to as *video podcast*. It was hypothesised that video content would be more likely to be played on a computer than a portable media player (Meng, 2005) but with the launch and success of video-enabled portable media players (such as the *iPod* video, Creative Zen video, Archos multimedia players, the Sony Video walkman and the *iPhone*) these are likely to become almost as accessible and popular as audio content.

Podcasts are usually made available online through the providers' own websites or blogs where, as well as the multimedia files, a number of additional content and tools can be found. These podcasts can be easily accessed by subscription from online podcast directories (such as *Odeo*, or *Podcastalley* - a search for "podcast directory" in a search engine will bring up thousands), or by content management software, (also known as aggregators or podcatchers) such as *Juice* (formerly *iPodder*). This ease of access was multiplied by the adoption by Apple of podcasting distribution via their *iTunes* store, where podcasts are arranged by topic or can be searched and can be subscribed to with a single click (see figure 1: *iTunes* podcast directory). Before that, podcast directories were there to be found only by those actively looking for them. By making them accessible within a shop that caters to consumers of audio and video who are looking for content for their media players, Apple have delivered worldwide exposure to public podcasts and created opportunities for casual access to content to become a formal learning opportunity (the concept of "stumble and learn", Kukulska-Hulme & Shield, 2006). Podcasting may appear to be elitist and limited to those that own a portable media player, but many western secondary and HE students have a portable player and / or access to *iTunes* (University of Michigan School of Dentistry reports that 65% of their students own an *iPod*, Blaisdell, 2006) and most podcasts can be played through a PC, a PDA or an mp3-enabled mobile phone.

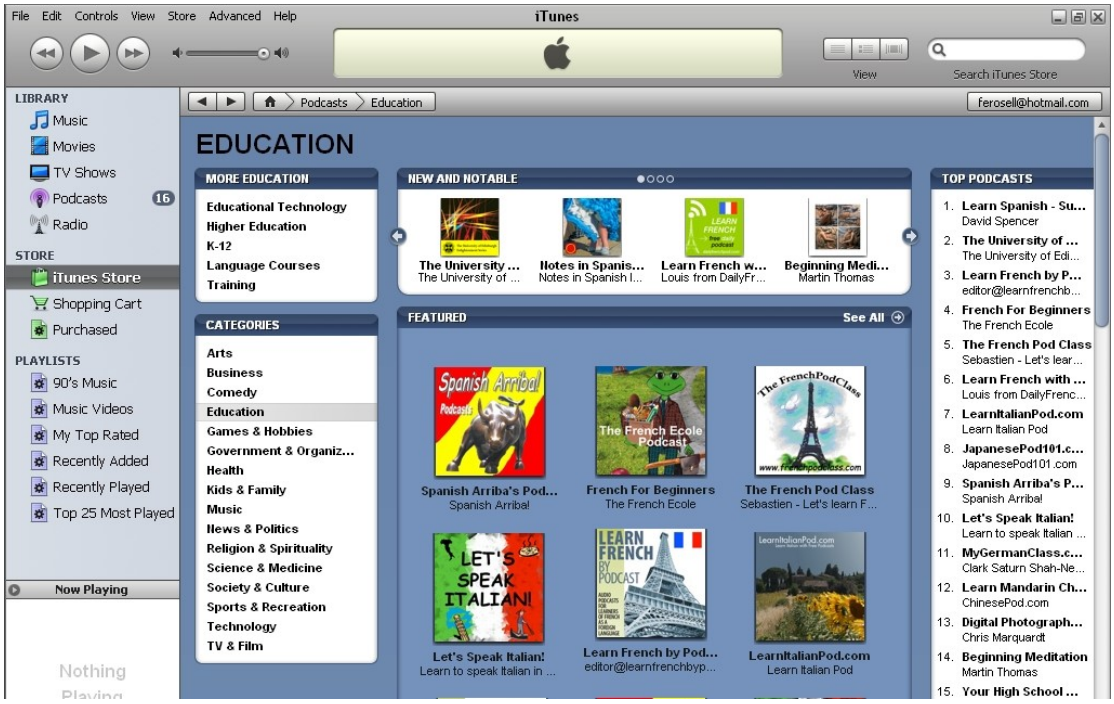

Figure 1: Podcast directory from *iTunes*. Podcasts are classified by categories and can be searched. The education category lists all educational podcasts and includes a section for language courses.

Graham Davies (2005) claims that the single piece of technology that has affected language learning most is the cassette recorder. The typical personal media player is no more than a walkman with digital media files instead of cassettes (in fact, the French words for podcasting, *diffusion pour baladeur* or *baladodiffusion*, originate from the French word for walkman) and the delivery of media content online is not new either: audio and video on demand, either as a download or via streaming, has been popular since the 1990s. The impact of this phenomenon is not in the device itself or in the availability of the content but in podcasting - “what’s new about podcasting is the ease of publication, ease of subscription, and ease of use across multiple environments” (Campbell, 2005, p. 34) - and its popularity. This popularity comes from the aforementioned ease of access, the increase of broadband users, and the proliferation of portable media players.

Developments in podcasting technologies provide two main potential uses: creating podcasts and using the podcast resources available. Most literature on the use of podcasting for language learning (Diem, 2005; McCarty, 2005; Meng, 2005; Bankhofer, 2005; Stanley, 2006) has focused on technical issues of creating and

distributing podcasts, and not on the theoretical underpinning of teaching through the medium or an evaluation of the resources available based on SLA theories. This paper will focus on the latter, evaluating a number of podcast resources available through *iTunes*. Podcasting can provide access to a large amount of authentic input, as well as to teaching materials of varying quality that have different approaches to language learning behind them (depending on the content provider): from behaviourist to cognitive constructivist and communicative approaches, situated learning, and lifelong learning. The impact of podcasting on learning in general and language learning in particular could be similar to the impact of the arrival of the internet in terms of giving access to language learning materials (mostly free of charge). The issues its availability presents are in many ways similar to those that arose in the early days of the internet, when the pioneers were enthusiastic individuals rather than institutions and the quality of the content varied enormously before a pedagogy of learning, task design, interaction and other issues was developed. The following sections will present a review of the potential of podcasting for language learning and current resources available, and discuss what the next steps are to arrive at a “podagogy” for language learning and its research potential.

2 Podcasting and language learning

Language learning has been identified as one of the disciplines likely to benefit from developments in podcasting (Kukulska-Hulme, 2006). In this section the current practices in podcasting are presented along with theories of learning, potential for learning in general and for language learning in particular.

2.1 Current practice in podcasting

Podcasts are available for many different types of content from various providers or podcasters. The main content providers in no particular order are:

- broadcasters who place their radio programmes or especially-recorded content online,
- performers who wish to promote their material,

- film studios who make film trailers available to promote them (both mainstream and independent studios),
- individuals with something they want to say or share,
- educational institutions and teachers who provide learning content on many fields. Initially these were more technologically oriented.

Podcasts have evolved at a rapid pace. Whereas in 2005 podcasting was limited to audio files, in 2007 there is a range of multimedia content available. The main type of content available is still audio, usually in mp3 format files, although they are also available in other formats such as mpeg 4 audio (.mp4 or .m4a extensions) and ogg formats. Some podcasters produce podcasts which include images that display during play. This may be a single image which advertises the podcast provider or, in the case of enhanced podcasts, a number of images to support the audio content. Video podcasts are increasingly available. These usually come in m4v format - which can be played through *iTunes*, *Quicktime*, or some video portable media players - or the more traditional mpeg format. In addition, some podcasters also provide documents in PDF format. These formats and how they are used will be discussed later.

Earlier in this paper, podcasting was divided into two main potential uses: creating podcasts and using the podcast resources available. For those that wish to create podcasts, there are two main types: podcasts created by teachers, and podcasts created by learners. Meng (2005, p. 5) lists the following possible uses of creating podcasts:

- Record and distribute news broadcasts.
- Recorded teacher's notes.
- Recorded lectures distributed directly to student's MP3 players.
- Recorded meeting and conference notes.
- Student projects and project support interviews.
- Oral history archiving and on-demand distribution.

Available language learning podcast resources can be classified into two main groups: the first one is authentic content provided by native speakers of the target language,

primarily to be used by native speakers, such as news feeds or radio programming. Examples of this can be found in the webpages of major television and radio broadcasters or by searching for themes of interest (football, news…) in the various aggregators available. *iTunes* used to feature an international category among its podcasts which allowed users to search by language of the podcast, but that category was removed from later versions.

The second group is language courses or teaching content specifically designed for language learning. This content can be classified (like other online learning materials) into whole stand-alone courses that strive to operate as virtual classrooms or add-on activities to classroom teaching or distance education (following Felix, 2003). Therefore, there are two types of resources: those that aim to provide whole stand-alone courses and those that provide supporting material. The former will be reviewed in section 3.2 with two examples of podcast-led course material provision. The latter are classified into two subgroups: materials designed for an established audience - such as the materials provided by teachers or institutions for their own students - and supporting materials designed for independent learners who are not enrolled on a particular course, delivered as a public broadcast.

Teaching materials for an established audience are materials that are custom made by the instructors for the needs of their own students and support the course syllabus by providing additional material to their classroom-based tuition. Among the first institutions to implement the introduction of portable media devices to learning were Osaka Jogakuin College in Japan, which was the first educational institution to provide *iPod*s for its students (McCarty, 2005), and the initiative at Duke University, in North Carolina (US), to provide all first year students with *iPod*s. Their use of the devices was based on the provision of custom-made materials to their own students. For their provision of Spanish at Duke, the teacher provided audio recordings of texts, oral quizzes, pronunciation samples, oral feedback, audio exercises, songs (with copyright clearance) and “audio flashcards” where she reads out loud key vocabulary items. She also sets “audio diary” assignments on a weekly basis, which consist of students’ recordings on given topics (http://cit.duke.edu/ideas/newprofiles/merschel.do). After the success of the Duke initiative, other institutions began providing podcast content for their students. At the time of writing, Stanford University, the University of Michigan

School of Dentristry, and Berkeley University in the US use *iTunes* U, a content management software almost identical to *iTunes* but which provides content tailored to the students of those institutions and which does not promote the retail side. Another use that teachers make in their institutions is podcasting projects, in which students work individually, together in peer groups or together with their instructor to create content which is then uploaded to a podcast directory. As well as the language learning advantages of this work, its production can be motivating and stimulating (Stanley, 2006), but with some exceptions where the content is actually of use to other learners, it could be argued that this may be more a case of vanity publishing and using podcasting as a distribution method.

Supporting materials for independent learning are materials provided by institutions or individuals who have no particular fixed target audience (at least not in the sense of a particular group of students in the previous category) and are the subject of a fuller overview in section 3, where these initiatives will be examined and some of the current practices reviewed.

This taxonomy of uses of podcasting for language learning can be summarised in the following way:

Figure 2: taxonomy of uses of podcasting for language learning.

Due to the relative newness of podcasting and its adoption as a tool for language learning, academic literature on the subject is scarce, but the next section will present what some education bloggers, software developers, journalists, and enthusiastic individuals have written on the subject. In addition, it will present the advantages and challenges of podcasting for learning in general and for language learning in particular in the light of theories of CALL and second language acquisition (SLA).

2.2 Podcasting and theories of learning

A number of theories of learning can support the use of podcasting for language learning: constructivism; the use of authentic materials for language learning; informal and lifelong learning; theories on the use of learning objects for the provision of learning materials; mobile learning; as well as the practices of chunking and just in time teaching, among others.

Podcasting is consistent with a constructivist view of the learning process, where an individual representation of knowledge is constructed through active exploration, observation, processing and interpretation (Cooper, 1993). Some may argue that podcast materials on their own fall short of one of the “basic tenets” of constructivism (Dalgarno, 2001) in that there is no social context for learning to occur and interaction to take place. However, Ellis (1999) argues that whilst interaction is facilitative, it is not necessary and learners can learn from non-interactional input, which supports the use of podcasting within this framework. In addition, this only applies when the podcasts are accessed on their own. Since most podcasters give access to their material through a blog (which is also linked to from aggregators such as *iTunes*), the benefits of Web 2.0 affordances can create social environments where interaction could take place, as will be discussed later.

As stated above, podcasting provides access to authentic materials which, as well as the potential for learning about aspects such as the history, culture, and politics of the areas where the target language is spoken, provide opportunities to notice vocabulary and grammatical structures. Authentic materials thus also become sources of information about the usage of the language (Ryan, 1997) and have the potential to draw the learner into the communicative world of the target language community

(Little, 1997). Authentic materials bring together language learning and use and can develop confidence in the learners, as they appreciate that learning can take place successfully even if the learner does not achieve total comprehension of the input (although the lack of comprehension can also be a source of frustration).

Theories of Informal and Lifelong Learning suggest that learning can happen all the time and, depending on the learner's intent, be intentional or accidental. This view of learning which "takes it outside the classroom and, by default, embeds learning in everyday life" (Naismith et al, 2005, p. 3) is appropriate to podcasting, as users may come across content more by accident than design but also consciously look for it, and learning (both accidental and intentional) is taken outside the usual learning environment and accessible anytime anywhere.

With regards to the use of podcasts as a source of language learning materials, podcasting can also be viewed as the provision of learning objects. David Wiley defines learning objects as "any digital resource that can be reused to support learning" (Wiley, 2000, p. 7). Another definition states that "the term "learning objects" generally applies to educational materials designed and created in small chunks for the purpose of maximizing the number of learning situations in which the resource can be utilized" (Kovalchick & Dawson, 2003). In fact, podcast directories could be viewed as the next step in the availability of repositories of learning objects adapted to an RSS feed, as advocated by Wiley (see Godwin-Jones, 2004).

Podcasting shares its salient characteristics with the field of mobile learning, which "can be spontaneous, personal, informal, contextual, portable, ubiquitous (available everywhere) and pervasive (so integrated with daily activities that it is hardly noticed)" (Kukulska-Hulme, 2005, p. 2). Mobile learning is defined as "taking place when the learner is not at a fixed, predetermined location, or when the learner 'takes advantage of the learning opportunities offered by mobile technologies'" (Kukulska-Hulme, 2005, p. 1). However, literature in the field has been slow to include portable media players, which until very recently it did not seem to consider part of the expanding range of mobile learning devices. In a major review of mobile learning in 2005, many other devices were included among personal portable learning devices including mobile phones, PDAs, games consoles, tablet PCs and laptops, but not portable media

players (Naismith et al, 2005). This was probably not an oversight: portable media players were irrelevant to mobile learning as available learning content for such devices was non-existent or very limited. What has brought a change is not the players, which have been available for years, but the popularization and availability of the content through podcasting: later literature on mobile learning does include portable media players among mobile learning devices and highlights the fact that, unlike PDAs, mp3 players are widely owned (Kukulska-Hulme & Shield, 2006), and reports that mp3 players are "particularly conducive to creative and social uses that had not been anticipated" (Kukulska-Hulme, 2006, p. 304).

Many of the lessons learnt in the field of mobile learning apply to podcasting for language learning, such as design that takes into consideration screen size, chunking knowledge as independent learning objects to facilitate processing of information (Ally, 2004), and most importantly the distinction made between didactic and discursive learning. Didactic mobile learning is "learning from mobile educational material (…) in a way that responds to the potential and the limitations of mobile devices" (Kukulska-Hulme & Traxler, 2005, p. 26) whereas discursive mobile learning is based on the interaction among mobile learners. This is similar to Felix's distinction between delivering content and creating interactivity and connectivity to achieve best practice in online language teaching (Felix, 2003). Among the podcast resources reviewed for this paper, the practices observed in the materials support didactic learning / delivering content. The opportunities to encourage discursive learning / creating interactivity could be provided through the associated blog environments (for those that offer them), but this is limited to use through devices that provide access to such environments (PDAs, laptops, desktop computers) and not accessible through most personal media players. Furthermore, many of these providers fail to encourage users to interact and the only tool they tend to provide is the comment facility, where many of the contributions are limited to short comments to thank the providers for the files and say how useful they are.

2.3 Potential for learning: advantages and disadvantages

The introduction mentioned how, as research field, the potential of podcasting is only beginning to be explored. The literature on the subject is very limited, but there has

been some discussion on podcasting, its advantages, challenges, and many potential uses (Sloan, 2005; Meng, 2005; Clark & Walsh, 2005; Kaplan-Leiserson, 2005; Menzies, 2005; Thorne and Payne, 2005; Stanley, 2006; Moody, 2006; Scinicariello, 2006).

Advantages

As well as the aforementioned access to authentic and bespoke teaching materials, among the advantages of podcasts for language learning are:

- Portable, convenient and easy to use format (Blaisdell, 2006; Clark & Walsh, 2005): once downloaded, the files can be can be taken away and listened to anywhere, as many times as necessary, at a time when it is convenient. Functionalities such as pause, forward, or skip mean that the user is in control of the pace (Sloan, 2005). This also enhances support for students with particular needs or learning preferences and contributes to reduced dependence on physical materials (Menzies, 2005). In addition, the content can also be played on a computer if the student does not have access to a portable media device.
- Attractive (Stanley, 2006): “in terms of design, marketing and consumer appeal, [*iPod*s] are hard to beat” (Clark & Walsh, 2005, p. 11). The fact that portable media players are widely owned and podcasts can be obtained from a music store may both increase use (attracting a potentially very large audience and also audiences who may not otherwise access learning materials) and make listening to an educational learning object feel less like studying.
- Motivating: students are likely to be attracted to the new format, which could be motivating and help them engage with materials which they might otherwise not use.
- Easy access: content management software such as *iTunes* or *Juice* can be downloaded free of charge and navigation is simple.
- Value for money: downloads of learning materials are free, and developing materials can be done for a fraction of the cost of producing traditional materials and in hours rather than years (Moody, 2006).

- Publicity: public podcasts give visibility to the individuals and institutions that provide them and institution-wide initiatives give those institutions free publicity as well as a good reputation for using the latest technologies.
- For those providers that use podcasting within an institution to provide additional resources for their students, podcasting provides the potential to allow lectures to focus on interaction, shifting preparatory work to outside times and locations (Blaisdell, 2006) as well as integrating in-class and out-of-class activities and materials (Thorne and Payne, 2005).

Challenges

Among the challenges of using podcasting, Sloan (2005), Menzies (2005), and Blaisdell (2005) highlight the increase in teacher workload for those that create the content. Menzies mentions the fact that podcasting may be a barrier for students or teachers who are technically challenged, and also raises other issues such as the lack of searchability of files and the potential for information overload (although sites such as *Podzinger* now allow the user to search text within podcasts and search engines can find transcripts from those podcasters that provide them). Blaisdell lists other challenges including the changes in the relationship between teachers and students - "If the lecture is going to be available for downloading, why bother coming to class?" (Blaisdell, 2005, n.p.) -, the fact that the pedagogical opportunities provided may require rethinking course objectives and learning outcomes, and questions about copyright issues and lack of administrative and technical support. He wonders whether the use of *iPod*s may not be "more of a gimmick than a true pedagogical tool" (Blaisdell, 2005, n.p.).

Perhaps the biggest issue to arise from the use of podcasting for learning is the fact that content has so far been mostly delivered mostly through audio. Clark & Walsh (2006) claim that as a channel for learning, hearing has a number of advantages, which include being instinctual (as opposed to reading which has to be taught), gets round issues such as illiteracy and dyslexia, frees eyes and hands for other purposes, is socially acceptable (as something to do whilst commuting, for example), is aligned with lifestyle (the cool factor of owning a trendy gadget such as an *iPod*) and that

listening and learning go hand in hand. They claim that the mp3 player is “a sit back and listen, reflective device that allows you to relax, think and learn” (Clark & Walsh, 2006, p. 11) enhanced by the fact that having to listen through earphones heightens isolation and concentration. This has obvious implications for learner types: visual (as opposed to aural) learners may not find materials suitable or be able to engage with them. Another factor that is inherent to audio content is that it cannot be skimmed (Jennings, 2004) to check the content and its suitability or appropriateness for purpose, which can be very disappointing and/or time consuming after having downloaded a resource from a repository.

Potential uses

Some reports outline the potential uses of podcasting for learning. Among these uses, Sloan (2005, slide 12) lists:

- For distance learning.
- To facilitate self-paced learning.
- For remediation of slower learners.
- To allow faculty to offer advanced and or highly motivated learners extra content.
- For helping students with reading and/or other learning disabilities
- To provide the ability for educators to feature guest speakers from remote locations.
- To allow guest speakers the ability to present once to many sections and classes.
- To offer a richer learning environment.

Kaplan-Leiserson (2005, n.p.) lists the following ways that podcasting can contribute to the learning process:

- Assist auditory learners.
- Provide another channel for material review.
- Assist non-native speakers (who can listen many times, stop, rewind…).

- Provide feedback to learners.
- Enable instructors to review training or lectures.
- Replace full classroom or online sessions when content simply requires delivery.
- Provide supplementary content or be part of a blended solution.

The lists above are generic, not specifically for language learning, although the uses listed are particularly suited to studies of music and languages, where the audio component is most beneficial.

3 Review of current resources available

Initiatives such as Duke's provide not only content, but also the actual portable media players for their students. However, as stated above, one of the success factors of podcasting is the fact that portable media players are commonplace devices. Many users log on to online music retailers to purchase audio or video content and only then discover the array of materials available free of charge in the form of podcasts. Other users may actively look for those materials in podcast directories. Some of these public podcasts are very successful and report monthly subscriptions of 800 (Diem, 2005) and 1000 users (Moody, 2006). The amount of free content (of varying quality) available in the internet has led many users to expect all learning online content to be free. The number of sites that charge for their language learning content is quite limited, and even those normally provide some free content or free subscription for a short amount of time to sample their product. Among the current providers of independent language learning podcasts, there are two clear distinctions: those that do it to generate profit and those who do not. The podcasters that wish to generate profit are those who either wish to gain publicity for their institution (language schools that want to get their name known or publicise their services by providing some free content, for example) or those that provide content (such as online exercises, feedback and support, transcripts, or flashcards that support the content of their podcasts) as an incentive to subscribe to their premium services. The podcasters that do not appear to be providing content for profit are for the most part enthusiastic

individuals or organisations that wish to share their knowledge and their work or their students' work.

Having audio or video online is not new, but what is innovative is to provide it as stand-alone items for independent learning delivered direct to your computer or portable media player. Like in many cases in the past, with the arrival of new software affordances the pioneers at times appear to be producing content more because they can than because they have a product that fits or has been designed for the new medium. Most content currently available is provided by innovative teachers (rather than language learning institutions), some of whom do not seem to have learnt the lessons from the past (Levy, 1997) to inform the use of new technologies.

Describing the different materials available as podcasts would be like trying to describe all types of language learning materials available as websites, there are many different types with many different approaches and with great differences in quality. In this section examples available from *iTunes* (as it is the most popular provider) will be examined.

One big issue about evaluating any medium or tool for language learning is fitness for purpose. Despite the fact that some materials aim to generate profit and / or publicity for the institutions that provide them, it will be assumed for this review that their main purpose is language teaching, and therefore resources will be evaluated under the light of theories of language learning. The materials available as free teaching podcasts for independent learning will be examined from two overlapping perspectives: design and pedagogy.

3.1 Design:

The design of bespoke language teaching materials depends on the resources and tools available. Podcast content can include audio, video, images, music, and ancillary materials.

Audio: currently, the format most used to deliver tuition through podcasting is audio in a variety of digital formats. Most teaching materials consist of a monologue or "lecture"

on a specific grammar point by a teacher, or a scripted dialogue with a native speaker or a person posing as a learner. Whilst some of the teachers / presenters are very skilled at this and manage to communicate both the content and their passion for the subject in an appealing manner, some have very flat voices or styles which do not help the learning process in an environment where the auditory channel is (unless support material is accessed) the only channel for intake of information. Other materials (with some examples that can be found on *iTunes* in brackets) include: recipes (both in the target language and foreign recipes in English, such as *Cuisine from Spain*), interviews (*BBC Estudio 834*), poetry (*Easy French Poetry*), intercultural knowledge both in English and in target language (*Notes in Spanish* and *Impresiones de España*), showcases of students' work (*French for kids by kids*), or podcasts about language learning resources and strategies (*Trying to learn Spanish*). Audio quality varies between providers. The average length of each the language learning podcasts available varies enormously. They range from a few seconds for those that provide just a useful phrase and its translation, to over 40 minutes of lengthy explanations, repetitions and examples. The issue of how long podcasts should be has been the matter of several online discussions[1], with preferences expressed for nothing over 2 minutes to users who prefer up to 30.

Video: although at present the vast majority of materials are audio only, video podcasts are becoming more popular. Some video materials consist of a teacher talking to camera to explain a grammar point, much like the audio "lectures", but aided by graphics or subtitles (such as the *Rolling R's* podcast). In some cases, these are accompanied by semi-authentic video recordings (*Japaneseclass* podcast). There are also mini-documentaries with a target language track, or even a short soap opera (*Mygermanclass.com*) with video episodes subtitled in German. Some providers take into consideration the medium in which these are going to be displayed (the screen size of a video *iPod* is 3.5") and others do not. Podcasters such as Rolling R's show subtitles with a suitable size that can be read on an *iPod* screen, but also show words on a board behind the instructors that can only be read if the video is displayed on a computer screen. Similarly, *Japaneseclass* displays too many items on screen (kanji

[1] Such as the one at http://www.ericmackonline.com/ica/blogs/emonline.nsf/dx/whats-your-ideal-podcast-length or the discussion at http://www.businessweek.com/the_thread/blogspotting/archives/2006/06/whats_the_best.html

characters, their roman alphabet phonetic transcription, translations, and subtitles, all too small for the small screen) at great speed. The *Frenchpodclass* podcast delivers video files which work like audiovisual flashcards that consist of still pictures with an object and its name in French whilst an audio track comments on the words, meaning, and pronunciation.

Images: the audio tracks can have images associated to the file that display alongside the audio track. Most providers use a single image throughout the track, which is normally the same as the podcast logo they use to advertise their presence on *iTunes*. Unfortunately, many of the language providers opt for images that perpetuate the stereotypes about the cultures of the language they teach rather than trying to educate learners into breaking away from them: a bull with a Spanish flag background, a flamenco dancer, the Eiffel tower, a frog holding a baguette… (see figure 1). Moreover, these images also seem to favour certain countries among all the many areas where the language is spoken: materials for Spanish tend to have images related to Spain and not any of the Spanish-speaking countries in Latin America, for example.

Music: Many podcasts begin and end with a snippet of music which, again, is often very stereotypical (accordion in French, guitar in Spanish…). This can be quite tiresome when doing repeated listenings and when listening to several episodes of the same podcast. Some also keep the music in the background, which is at best distracting, and in some cases impedes comprehension.

Ancillary materials: some content providers include additional materials in PDF format into their podcasts. *Frenchpodclass*, for example, delivers vocabulary sheets with translations, transcripts, and images, exercise sheets with solutions, and bilingual texts. Other providers choose to make these resources and other supplementary materials available to subscribers only.

A newer podcast format is enhanced podcasts, which have more affordances as they can be divided into chapters (which offer the opportunity to skip to the wanted section), can come with lyrics or transcripts, and more than one image can be embedded allowing for photos to be used to illustrate the point being made in the audio track. However, a problem with podcasting is that the more affordances that are provided,

the more restrictions that are placed in terms of the audience that the material will reach and how it can be used. Enhanced or video podcasts, for example, can only be played on personal media players with video capabilities or on a computer with *iTunes*. Similarly, PDF materials do not display on personal media players, therefore limiting mobility, one of the identified advantages of the format.

3.2 Pedagogy:

In section 2 it was argued that podcasting had the potential to support learning as it is understood by constructivist theories, and was consistent with the thinking behind theories such as the use of authentic materials for language learning; informal and lifelong learning; theories on the use of learning objects for the provision of learning materials; mobile learning; as well as the practices of chunking, and just in time teaching, among others. With the current affordances listed in the previous section, materials developed for podcasting fit with SLA theories as they have the potential to

- make use of authentic materials (Little, 1997),
- be meaningful and engaging rather than repetitive or stressful (Oxford, 1990),
- offer opportunities to hear modified comprehensible input that allows for a focus on target features of the second language (Holliday, 1999)
- be appropriate to the medium used (Furstenberg, 1997),

Whilst the potential is there, many of the materials and designs available appear to be mostly consistent with outdated theories of learning, such as a behaviourist view of language learning, where the teacher is the only source of knowledge, materials consist of lengthy grammar explanations, and knowledge is assumed to be acquired individually by a “listen and repeat” approach. Furthermore, students are not encouraged to interact with one another, therefore appearing to be more consistent with the input hypothesis than with an interactionist approach to SLA. Much of the material is not organised in any obvious way in the directories and it is only after downloading that users can check level and content. In most cases there are no available suggestions about how to use the materials, syllabi, or statements of objectives, either in general or for the individual episode. Furthermore, users are

addressed mostly in English regardless of the language level, and some of the materials reinforce cultural stereotypes. The length of some of the resources makes them unmanageable and inconsistent with theories of distance learning or learning objects. Also, the aural-only approach that many providers use is limiting and sometimes frustrating, and in addition, it does not seem to take into consideration visual learners or dyslexic users (for example, when words or URLs are spelt quickly).

However, “hit and miss” pedagogies are commonplace with emerging technologies and the fact that many providers are podcasting materials that are not consistent with current thinking in the field of language learning does not mean that the potential is not there, or that the current materials are not fit for purpose. There are providers who are producing pedagogically sound materials, but a deeper look into how the materials are conceived is necessary: on *iTunes* and other directories, users can try different sources and pick and choose whatever suits their needs and style best, so in most cases the podcast materials they use will most likely not be the only source of learning, but part of a “pick and mix” of resources. It is most likely that those podcasters that provide content that does not require subscription do so with a view of their materials as peripheral to some form of formal tuition. In fact, user feedback in the form of reviews of each podcast reveals that many learners use the materials to “brush up” on languages they studied at school or as revision and additional support to their current tuition.

From that perspective, the materials available can work to support language learners with a variety of learning styles, and listening to grammar explanations, drilling grammar points, repeating useful expressions and vocabulary, and practising listening and pronunciation, as well as learning about the cultures of the target language, are very valid and worthwhile activities to do whilst commuting, or whenever the listener accesses the podcasts on their portable media player. Most distance language teachers would probably agree that despite the efforts to provide activities that engage the learner in communicative social acts, what the students always request is more grammar drilling. User reviews support this point as most of the materials used for this review (including those whose approach may not be considered pedagogically sound in the light of SLA theories) have achieved a star rating of four and above out of a possible five-star rating by listeners.

That is not to say that all content meets the minimum quality standards. Another downside of publishing available to all is the well-meaning content provider who not only knows little about teaching, but also knows little about the subject. A podcast called *Spanish Phrase of the Day* exemplifies that. This podcast, created by a Californian magician, claims to provide “at least one useful and practical Spanish phrase every day from someone who loves the language”. In practice listeners get phrases that are often grammatically incorrect, badly spelt, and of doubtful value to the learner, such “He has committed a crime and now he is in prison”, “He refused to give a speech”, and “In the next four days I will do four magic shows”. The files are of varying audio quality and the explanations by the author include lines such as “I think this means…” The podcast has been online longer than many others but had not received any positive feedback at the time of writing.

Top of the Pods

There are two main examples of best practice in podcasting: Chinese Pod and Japanese101. Their providers follow a podcast-based language tuition model where the podcast materials form the main basis for teaching. Their strategy includes:

- clearly identified levels and content. Japanesepod101 divides materials into survival phrases, beginner or intermediate. Chinese Pod into newbie, elementary, intermediate, upper intermediate and advanced. They also specify the type of content: audio magazine, culture, traditions, news or language points.
- use of a variety of native speakers with different voices, styles and of different ages.
- engaging, charismatic presenters.
- podcasts that last about 15 minutes on average, a length that feels neither too long nor too short.
- where appropriate, slowed down pronunciation, repeated carefully, taking beginners into consideration.
- cultural information that ranges from politics or sport to pop music.

- news programmes.
- clear methodology and outcomes: Chinese Pod's first podcast explains the aims of the materials (to teach spoken Chinese), delivery strategy, levels, and support materials available.
- A vast selection of support materials online (available to subscribers only) which include video content, grammar explanations and exercises, flashcards, transcripts, glossary, a comment tool, and online forums for peer support and opportunities for interaction within a developing community.

Their model is already being adopted by other podcasters such as *Learnfrenchbypodcast.com*. As these are commercial providers, they spend the time, effort and money to provide pedagogically sound materials and support. Therefore, they produce resources that are worth buying as a distance learning course (although the actual audio materials are still free) and which are consistent with current SLA, Mobile learning, and Open and Distance Learning theories and practices as presented in section 2.

4 Conclusion

The previous sections have described and presented an overview of the different types of materials available to language learners. While there is potential for a pedagogically sound approach, many of the resources available do not follow one. This paper has argued that the effectiveness of podcast materials depends on purpose. As a support tool, there are many opportunities to enhance language learning, be it through materials designed for a specific audience, teaching materials made available for a general audience, or authentic materials aimed primarily at native speakers. This paper also described how creating podcasts can be a worthwhile task for learners, motivating and engaging for the students who create them. Finally, good practice in podcasting as a potential main stimulus for language learning was described.

The first obvious conclusion of this review is that the technical know-how does not imply a pedagogic know-how. As in the early days of CALL, many providers have focused on the technological and neglected the pedagogical issues. Other issues

include upcoming technological and content developments and their implications for teachers, students, and language teaching material providers.

Both podcasting and mobile devices capable of playing audio and video content are increasingly popular, and this popularity, together with the expanding capabilities of those devices “will create a flood of multimedia content” (Meng, 2005, p. 10). This language learning content will be accessed by students and become commonplace and there are calls to act upon this: “those of us in higher education owe it to our students to bring podcasting and other rich media into our courses so that they can lift their learning to a whole new level” (Campbell, 2005, p. 44). The drive, however, should come not only from enthusiastic individuals, but also from institutions adopting the technology, accepting the implications of its use in the curriculum, and providing necessary training for all involved in its development and use.

Although a few may appear in a “featured” section and there are podcast download charts, all materials have the same status on podcast directories. They are one of many on a list, and a prospective user has to fully download at least one podcast episode to be able to evaluate it for their individual needs. Studies of online information literacy show that users should be aware of a number of issues regarding online content (who says what, when, why, how); similarly, podcasts should be evaluated in the same way. Students will have to develop a new skill to their online information literacy and use cues such as the descriptions provided, peer reviews, statements of aim and level, and their own skills to identify those materials that are suitable to their learning needs.

Next steps: design and research

Design

Just like writing online is different from writing for print, when writing or designing materials for podcasting, authors should be aware of some rules of task design for distance language learning and CALL with regards to, among others issues, length, content, style, approach, supporting materials and media format.

The development of materials so far seems to have been left to enthusiastic enterprising individuals and, although some academic institutions have adopted podcasting as a medium of delivery for their own students, there are very few professional language learning material developers producing content for independent learners as a viable course. This may not last long: "as the technology grows in popularity so too will the desire and demand to associate revenue with the content" (Meng, 2005:8).

There is more potential to be developed in task design for podcasting material within the scope of current affordances: audio is already being linked to images by some providers, and text is being presented in PDF format, which is very convenient for web delivery and supports visual learners but cannot be displayed on most portable media players (although it can on PDAs). As the *iPod*, for example, is able to display .txt text formats, and synchronise them to audio files, the potential to read whilst listening is enormous: from the use of transcripts for comprehension, shadow reading, or pronunciation work, to comprehension activities related to the audio.

As mentioned above, the more affordances that the formats allow, the more restrictions that are placed in terms of the audience that the materials can reach and the mobility that they allow. By providing materials that limit the mobility aspect of the medium, podcasters compromise the flexibility of the delivery, one of its main perceived benefits. Should providers compromise and sacrifice the excellent opportunity for ancillary materials to provide a service that is universal (mp3 only) or make a choice to alienate some but offer a richer product that affords more? Given that there are millions of users of *iTunes*, which allows the use (for example) of video and enhanced podcasts, would they actually be compromising their product? As far as the benefits of mobile learning are concerned yes, as only those users that have personal media players with video and enhanced podcast capabilities could take full advantage of the materials (and even then only some of the ancillary materials as PDFs, for example, would not display). PDAs or similar devices may provide a solution to this, as most can display the ancillary materials and different formats discussed and allow the user to take notes on the go, for example. But since these are devices that are more expensive and less widely owned than portable media players, they do not

support the main original idea of providing content to the mass audience that use personal media players.

Of course, it could be argued that a possible model for delivery of learning materials with a mobile strategy, where the multimedia materials are presented as mobile learning objects that are part of the mobile strategy and the ancillary support materials what the learners do at their computers. Online exercises related to the audio and video content are already available in some podcasters' sites. Pedagogically, though, the more you integrate the peripheral materials with the main audiovisual material, the better. By opting for a more pedagogically sound approach, the providers run the risk of alienating some of their audience or removing the mobility and flexibility. A compromise that some providers are opting for is to provide both options: *Coffeebreak Spanish*, for example, occasionally offer the same episode of their programme both as standard audio-only and as an enhanced podcast.

This paper has argued that most current podcasting practices support didactic learning, but do not, as yet, fully encourage discursive learning. Although interaction may not be necessary for learning to take place (Ellis, 1999), the medium of learning should provide learners with opportunities for interaction to negotiate meaning and opportunities to produce or write modified comprehensible output (Holliday, 1999). In addition, a wide range of theories in the field of SLA propose that language learning tasks should:

- be collaborative, interesting, rewarding, and challenging (Meskill, 1999),
- provide opportunities to produce target language (Chapelle, 1998),
- be interactive and include reporting back of the communicative outcome (Skehan, 2003).

Some podcasters already incorporate contributions from listeners into their podcast materials, but these are few. Learners could be encouraged to send in or podcast their audio contributions in the target language (introductions, exercises, thoughts on a given topic) and a general feedback recording could address major issues of presentation, style, pronunciation or important grammatical points to be aware of. With

web 2.0 support capabilities, this could also be done through blogs and forums by teachers or peers, as exemplified by Chinese Pod and similar enterprises. This way, learners would have the opportunity both to produce output and monitor their performance.

The adoption of audio and or video conferencing through synchronous communication tools such as Messenger, Netmeeting, Skype or similar software could be the next step in the efforts to encourage production and facilitate interaction with others. This would promote communicative competence and further develop community building.

Within those affordances and with that potential in mind, materials for podcasting should therefore:

- Provide exposure to the language and its characteristics
- Use a range of materials, including authentic materials
- Provide explicit learning outcomes with clear objectives within a defined syllabus
- Provide exposure to the culture of the areas where the target language is spoken
- Be engaging and of adequate length
- Have a clear consideration of the medium: including portability and screen size.

In addition, podcasters should provide environments that generate opportunities to produce output and interact with other learners and are supported by additional resources, such as transcripts, grammar explanations, glossaries, interactive online exercises, and forums for learners to form communities of support and to engage in communicative acts with others.

Research

The field of podcasting for language learning goes beyond the distribution of language learning materials and there are many issues that need to be researched to gain an understanding of the implications of the availability of this content and the best way to

develop and make use of the existing resources before arriving at a sound “podagogy” for language learning. The research agenda for mobile learning includes questioning the differences between face-to-face learning, learning supported by online technologies and learning supported by mobile technologies; the differences between the different technologies and their impact; and the types of learning, learner, subjects and situations that mobile learning can support effectively (Kukulska-Hulme & Traxler, 2005). These apply to learning through podcasting as well. Kukulska-Hulme and Shield (2006) hypothesise that the arrival of new activities through new devices may change the learning experience by possibly widening participation, giving more flexible access, shifting focus to aural learning, stimulating informal learning and making it easier for learners to contribute to, and build on, course content.

Before the impact on the learning experience can be researched, data is needed on the actual use of the resources. Duke University published a report which found that the *iPod*s they distributed were used by faculty to disseminate course content, and by students as a recording tool for the classroom and outside it (although this is not a functionality that comes with the *iPod* – an additional accessory needs to be incorporated), and as a study support tool (listening to the content provided or recorded) (Kaplan-Leiserson, 2005). But the affordances of the tool stretch beyond the initiative at Duke and questions that need to be asked include:

- How many users own a portable media player?
- How many of those have video capabilities?
- How are the resources accessed?
- When are they accessed?
- Are they played through the computer or on mobile devices?
- Do users utilise the resources as support for formal tuition only?
- How do different learner types use the resources available?
- How do students feel about the use of podcast resources? Does it feel like learning? How do they compare it to formal learning opportunities?
- Is there any evidence of effective learning through a podcast-based course based on feedback or assessment?

The answers to these questions would help inform design. Knowing whether learners watch videos mostly at the computer as opposed to their portable media players, for example, would have an impact on designing materials taking a 17” rather than a 3.5” screen size into consideration. So far design has informed usage (if the materials are designed for a bigger screen or come in format unsupported by personal media players such as PDF, there is no choice but to use the computer), but information on usage could turn this around. With the right information about usage, design and pedagogy would be aimed correctly at the different types of user.

An initial criticism of web-based language learning resources was that materials were mostly useful only to develop reading skills, and even that was questionable due to the varying quality of online resources. Similarly, it would be easy to assume that the possibilities of Podcasting are limited to developing listening skills; but it has potential to be much more than that, some of it already realised (and at the rate advancements are happening by the time this paper is published surely even more). With the right supplementary materials and environments, podcasting has the potential to bring us one step closer to fully delivering online language learning that can really take place anytime anywhere.

Publication 2:

Rosell-Aguilar, F. (2013) Podcasting for language learning through iTunes U: the learner's view. *Language Learning & Technology*, 17(3), 74-93.

Abstract

iTunes U has become the main worldwide provider of educational podcasts but, despite its popularity, little is known about the type of user who downloads iTunes U language resources, or how those resources are used. This paper presents the results of the first major survey (1891 responses) of users of one of the most popular iTunes U content providers in terms of downloads. It presents a profile of the iTunes U language learner, their listening habits and their opinion of the resources they download. Comparisons are drawn between language learners and learners of other subjects. The results show that in contrast with profiles of learners in other contexts, such as VLE-delivered podcasts, identified in previous research (mostly carried out with young university students who download podcasts for instrumental reasons) iTunes U language learners are different. Respondents in this study are mostly middle-aged, employed, and download resources for personal interest. Users have a high opinion of the quality of the materials and believe they help them to learn. The results also show that users listen to language podcasts on mobile devices, in sharp contrast with previous research. Finally, the paper discusses implications for further research.

1 Introduction

In a relatively short time, podcasting has revolutionised access to media and educational resources. In the case of education, it has afforded unprecedented access to learning and teaching materials. Teachers have long used Virtual Learning Environments (VLEs) / Learning Management Systems (LMSs) to provide access to (first audio, then audio-visual) media content for their students. The use of digital audio and video files has become widespread and commonplace across most of the world, both in and outside education, helped by the proliferation of resources and the increase in availability and affordability of portable media players.

The main agent in the podcasting revolution has been iTunes, Apple's digital media store and podcast aggregator, launched in 2003. In 2007 Apple released iTunes U as a repository for educational content provided by universities. Some of that content is restricted to the institutions' own students and some is made publicly available. With this initiative, Apple and the universities that agreed to deliver open content changed

access to hitherto exclusive world-class lecturers and materials. iTunes U has now established itself as the main provider of educational podcasts, with over 1 billion downloads between 2007 and 2013 (Apple, 2013). An iTunes U app (software application) was launched in 2012 to provide mobile access and new affordances to the software, such as linking resources (e.g. audio and e-books to form a course).

This paper reports on a major study of 1891 iTunes U users who utilise the resources available there to learn languages. First it will describe the research carried out so far into the use of podcasting as a language teaching and learning tool. Then it will present a number of questions and hypotheses about language learners who use iTunes U and provide details of the study that was conducted to answer those questions, shedding light on the aforementioned hypotheses. The results of the study will be presented and discussed. Finally, it will offer a conclusion based on the findings and identify areas for further research.

2 Literature review

2.1 Podcasting as a teaching and learning tool

A number of factors have contributed to the popularity and growth of podcasting. These include the growth of broadband and wireless connectivity, the shift towards increasingly mobile devices, the success of the portable digital media player and its integration into other devices such as the mobile / cell phone, the ease and relatively low cost to produce podcasts, and the adoption of podcasting by major media broadcasters as a way of delivering catch-up services, among others. This growth has run parallel to the increase in use of podcasting as a teaching and learning tool, both by enthusiastic individuals and at the institutional level.

Podcasting technology soon caught the attention of early adopters among academic practitioners and researchers. The first reports described the potential uses and benefits of the technology (Blaisdell, 2006; Clark & Walsh, 2004; Laing et al, 2006, Manning, 2005; Meng, 2005; Sloan, 2005). These included the convenient, portable and easy to use format, its attractiveness, low cost, capability to personalise learning

and integrate different types of activity. Early papers also highlighted some drawbacks. Many of these were technical limitations that have been overcome as the technology has progressed, but others included pedagogical considerations such as accessibility, increase in teacher workload, digital literacy, learning style issues, and the use of outmoded approaches that do not reflect current theories on teaching and learning.

Research moved on to evaluations of podcasting based on its use by teachers and learners (some early studies include Belanger, 2005; Edirisingha et al, 2007; Lee & Chan, 2007; McCarty, 2005). These studies were mostly based on university campuses, and produced a range of results (see Heilesen, 2010; Hew, 2009; and Rosell-Aguilar, 2009 for overviews of different projects and their outcomes). The general impression was that some of the perceived benefits of podcasting may not be such. For example, despite some evidence of students listening whilst travelling (Manochehri et al, 2012), many studies found little evidence of transfer of resources to mobile devices, putting into question the portability and informality benefits (Bennett, 2008; Copley, 2007; Lee and Chan, 2007; Lee et al, 2009). The perceived attractiveness and novelty factor of using podcast materials appeared to wear off soon too, and podcasting was often perceived in the literature as yet another formal learning opportunity. There were also mixed reports about attainment, ranging from disappointingly poor performance (e.g.: Daniel & Woody, 2010) to significantly increased scores after delivering podcast-based teaching (e.g.: McKinney et al, 2009; Reynolds & Bennett, 2008). Many researchers concluded that podcasting may work best to supplement teaching rather than as the main medium of delivery of teaching materials (Bennett, 2008; Evans, 2008; Daniel & Woody, 2010; Heilesen, 2010; Lee & Chan, 2007; Walls et al, 2010).

2.2 Podcasting for language learning

As a discipline that integrates target language audio recordings into the learning and teaching activity, language learning was quickly identified as a potential beneficiary of the affordances that podcasting provides as a teaching and learning tool (Chinnery, 2006; Godwin-Jones, 2005; Kukulska-Hulme, 2006; Stanley, 2006; Thorne & Payne, 2005). Arguments were put forward to explain how the use of podcasting in language learning is supported by a number of learning theories, including constructivist

approaches, informal and lifelong learning, and mobile learning principles, as well as the practices of providing learning objects, chunking and just-in-time teaching, among others (Rosell-Aguilar, 2007). Podcasting also fits with practices supported by a number of Second Language Acquisition (SLA) theories as conducive to language learning. One obvious use is the access to target language materials as sources of information about the usage of the language (Ryan, 1997) which have the potential to draw the learner into the communicative world of the target language community (Little, 1997). Gromik (2008) highlighted that podcasting technology provides learners "access to resources which are authentic, free, and otherwise not available" (p. 50) to territories where the target language is not spoken. Podcasting offers opportunities for active exploration, observation, processing and interpretation of language (Cooper, 1993). The ability to find many resources on a topic allows for narrow listening (listening to several different input sources on the same topic, Krashen, 1996). Furthermore, podcasting affords a personalised listening experience, as users can choose when and where to listen, what to listen to, pause, and rewind, speed up or slow down a recording, engaging in repeated listening. Podcast resources can provide the basis for meaningful and engaging activities, and offer opportunities to listen to comprehensible input (Krashen, 2003) which allows the listener to focus on specific features of the target language.

The advantages of podcasting go beyond the technical affordances it provides. In the same way that the initial introduction of the World Wide Web into education led to an increase in learning materials online, the popularisation of podcasting has led to the proliferation of a wealth of materials (developed by individuals, institutions, or broadcasters) that are of use to the language learner. This material includes both resources specifically designed to aid language learning and target language materials created for native speakers of those languages - which language learners and teachers can use, much like radio and television programmes have been used in language teaching and learning for decades (for recent reviews of identified uses of podcasting for language learning and ideas for its use in the classroom see Lomicka and Lord (2011), and Shinagawa (2012)).

An important difference between the use of podcasting for teaching and learning languages and its use for other disciplines is that listening in language learning

requires a different kind of listening skills: whereas in other disciplines the focus is on the content and meaning of the audiovisual resources, in the field of language learning the focus also lies - to varying degrees - on form (Doughty & Williams, 1998; Long, 2000; Skehan, 2003).

Some researchers have pointed out that the major limitation of podcasting for language learning is that, although it provides access to audiovisual resources, it does not afford another essential element of language learning: interaction (Stockwell, 2010). Whilst this is true of the podcasts of their own, there are a number of ways in which interaction based on the podcast resources can be encouraged: these range from basic-level engagement with ancillary materials that can be provided with the podcasts (e.g. transcripts or print exercises), to more advanced incorporation of other technologies (e.g. in VLE/LMS contexts, where the resources can be integrated with quizzes, forums etc.). In a review of emerging technologies written around the time when podcasts first emerged, Chinnery (2006) highlighted the potential for learning of cell phones, Personal Digital Assistants (PDAs) and podcasting as three separate technologies. Nowadays, all the features from all three technologies that were considered to have potential to aid language learning converge on devices such as the smartphone.

2.3 Previous research into podcasting as a language learning tool

A number of research studies into the use of podcasting for language learning have been carried out. The initial research focused on student ownership and use of mobile devices (Dias, Pagel, Browne & Menish, 2007). There were early reports of positive impressions of podcasting as a tool for language learning (Anzai, 2007; O'Bryan & Hegelheimer, 2007; Sathe & Waltje, 2008). The Sathe and Waltje study found that 56.7% of their 120 respondents agreed that the iPods they had been lent helped them to learn language better, 77.3% enjoyed doing listening exercises with the iPod, 67.6% felt more motivated to spend time on listening / speaking assignments and 50.9% believed there had been an increase on their knowledge of the target language.

Research moved on to actual language skills acquisition. Lord (2008) carried a small study with 16 students taking an undergraduate Spanish phonetics class in the U.S.

The students' attitudes and abilities were assessed both before and after the project. She found very positive reactions and an improvement in attitudes toward Spanish pronunciation, as well as "at least some degree of improved pronunciation" (p. 374). Lord acknowledged the difficulty to elucidate whether these improvements were the direct result of the podcasting activities or taking the class in general, but she considered the evidence sufficient to warrant further investigation. Ducate and Lomicka (2009) carried out another study into acquisition of pronunciation and, although they did not find significant improvements, their students received the integration of podcast use and production positively.

Abdous, Camarena and Facer (2009) surveyed students from eight language courses and reported that the participants felt using podcasts had had a positive effect on their study habits, the podcasts had been a helpful learning tool, and using the podcasts had led to improvement on language skills (oral and aural skills in particular) and vocabulary. They concluded that "podcasting can be an effective tool which facilitates the completion and evaluation of assignments in foreign language classes" (p. 88). In a more recent report, Abdous, Facer and Yen (2012) presented research carried out on 27 language classes over 3 years. Their findings suggest that the way in which podcast language learning resources are integrated into the teaching has an effect on grades, with students who were taking courses that used podcasting as supplementary revision material faring better than those who were taking courses where podcasting was integrated in the curriculum.

Other dimensions of language learning have been researched. Lee (2009), for example, explored the use of blogs and podcasts to promote intercultural exchanges with positive results.

2.4 iTunes U as a language learning tool

How much of the knowledge previously acquired about learning through podcasting applies to the iTunes U language learner? There is some evidence that whether users listen because they are students of the subject in the institution that provides the podcasts (referred to in this paper as internal learners) or whether they listen as 'interested public' (external learners) may have an effect on their podcast listening

practices (Hürst, Welte & Jung, 2007). This could be related to the differences between intrinsic motivation (driven by personal interest) and extrinsic motivation (driven by the desire to achieve a goal such as passing a course) in language learning (Oxford, 1996) and it may have an effect on teaching delivered through iTunes U. Many of the research projects listed in section 2.3 took place in traditional face-to-face institutions, where the researchers provided podcast resources to their students mostly via VLEs/ LMSs. Participants in those research projects reported lack of transfer to mobile devices and perceiving the activity as academic, which is not surprising given that in most cases students are bound to look at an activity that their teacher has asked them to do as part of their formal studies. In this sense, their motivation for engaging (or not) with the podcasts is extrinsic. iTunes U users, in contrast, may use language learning resources to supplement their formal learning or they could be informal learners with an interest in a language who do not regard listening to iTunes U resources as a formal learning opportunity. In the latter case, their motivation for engaging with the iTunes U resources would be mostly intrinsic. In this sense, the delivery of resources through iTunes U as opposed to other delivery systems has the potential to make a considerable difference in terms of the audience (internal or external and intrinsically or extrinsically motivated) the resources will reach. This study, therefore, looks at iTunes U as a separate delivery medium different from podcasting in general.

3 Research questions and hypotheses

Based on the research literature discussed in section 2, and in the interest of developing a profile of the iTunes U language learner, a survey was developed to gather data to answer four main research questions:

1. Who is the iTunes U language learner?
2. Do they differ from learners of other subjects?
3. How do iTunes U language learners engage with the resources they download?
4. What is the learners' opinion of the resources they download?

The survey was organised in different sections, which included:

- Personal information: age, gender, geographical location, occupation,

- Studies and interest in iTunes U resources: whether users are currently enrolled on a language course, considering taking one, and their reasons for downloading. Whether the resources they download are the main source of learning or supplementary to other learning,
- Use of iTunes U resources: whether users transfer the resources to mobile devices, where they listen, whether listening is the main activity or they listen whilst doing something else,
- Opinion of the iTunes U resources: whether they think listening to the resources is helping them learn the language, rating the overall quality of the materials,
- Taking iTunes U learning further: whether the users would consider paying for content and whether they would be interested in some sort of qualification based on the iTunes U resources.

Due to the lack of available data about iTunes U learners, eight hypotheses were formulated before the survey was launched about the responses that it would elicit. These hypotheses were based partly on the characteristics of participants in previous research studies that were considered applicable to iTunes U learners, as well as (somewhat educated) guesses based on knowledge of language learners and podcast / iTunes U resources listeners. The hypotheses related to:

1. Gender: it's a general perception that men are early adopters of technology, but language learning traditionally attracts more female than male students (HESA, 2012). The hypothesis was that language iTunes U resources would attract more females than males, but the difference in proportion would not be as marked as that of traditional university language students.
2. Age: users were expected to be young in the majority. Podcasting is often associated with a young audience and so is the iTunes store. In addition, previous research on iTunes U has been carried out with typical university-age students. Despite this, the hypothesis was that a proportion of respondents would be older, in a similar way to the results found by Hürst, Welte and Jung (2007)
3. Employment status: it was assumed that students would represent the highest proportion of users of iTunes U resources (most students in developed countries have smartphones and portable media players), but not necessarily

the majority, as part of the iTunes U appeal is that it brings learning to users who would not otherwise have access to it. It was not assumed that those students would be enrolled at the institution where the research took place, but perhaps taking courses in another institution and supplementing their materials with iTunes U resources. It was also though that podcasting might also appeal to users who have retired from their working life, are curious and have more time to engage with iTunes U resources.

4. Use of Mobile Learning features: the hypothesis here was that this would be very different from previous research, given that the delivery medium is iTunes and not a VLE / LMS. So the hypothesis was that transfer to mobile devices and listening 'on the go' would be high.
5. Engagement: despite the previous hypothesis, it was expected that language learners would engage in listening as a main activity, as they would be more likely to focus on form than non-language learners. Since some universities provide transcripts on iTunes U, higher numbers of downloads and use of transcripts might provide evidence of this.
6. Rating: It was assumed that as these are free resources from a well-regarded university, users would rate iTunes U resources highly.
7. Paying for content: it was assumed that the vast majority of users would not be willing to pay for content. As users of iTunes U, they would be aware of the large amount of freely-available materials they can download.
8. Similarly, it was assumed that users would not be interested in a qualification as many would already be formal students of the language, and the rest would be independent learners for whom language learning may be an informal, lifelong process.

4 Context and methods

4.1 Context

A number of institutions have become key players on iTunes U, providing the largest number of resources and generating the most downloads. The research study for this paper was carried out at the UK Open University (OU), one of the top iTunes U providers in terms of number of downloads.

The OU is a distance learning University. It was established in 1969 and is now the university with the largest number of students in the UK, with 208,710 registered in 2012 (HESA, 2012). Its languages department is the largest in the UK and offers modules in Spanish, French, German, Italian, English, Chinese and Welsh. These are taught at a distance through a mixed media of print, audio and video materials, interactive digital materials (online or DVD-ROM based) and a mix of online and face-to-face tutorials.

The OU joined iTunes U in June 2008 after an invitation from Apple. It currently offers a large number of collections on iTunes U, comprising audio and/or video resources, which in most cases include PDF transcripts. Many universities offer recordings of lectures that have been delivered face-to-face at their institution and then uploaded to iTunes U. The type of resources that the OU offers on iTunes U is quite different. For the most part, OU collections consist of a number of shorter (1-15 minutes) recordings which have been designed as distance learning materials, either because they have been repurposed from the university's own course materials, or designed specifically for delivery through the university's media channels, including iTunes U. As of February 2013, 428 collections containing 3,261 tracks (1,484 audio, 1,777 video – as well as PDF transcripts and 423 iBooks) are available for download from iTunes U at the OU (The Open University on iTunes U Impact site, 2013).

The type of language resources that are offered on iTunes U at the OU varies. They represent all the languages taught at the OU and many of the different levels (beginner, intermediate, upper intermediate and advanced). Some collections for beginner or intermediate level include a teaching voice in English combined with recordings in the target language. Other collections are mini documentaries that explore the cultures of the target languages as well as focusing on the language itself.

By February 2013 the OU had generated over 60 million downloads (Open University press release, 2013). Almost 90% of iTunes U at the OU downloads are from outside the UK, where the OU is located and best known. The US is the country where most downloads originate (see Figure 1 below).

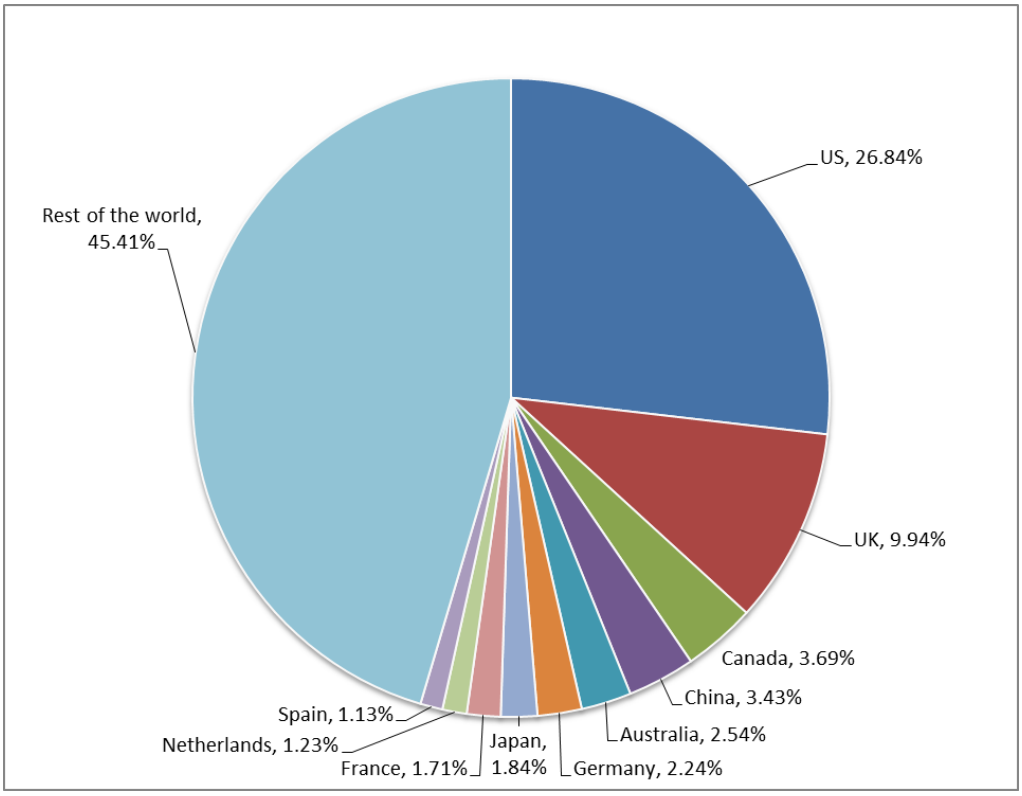

Figure 1: geographical location of iTunes U at the OU downloads

Language collections represent around 10% of the total number of collections the OU offers, but they account for nearly a quarter of all downloads generated, making them the most popular resources on iTunes U at the OU. They are also among the most popular overall: OU language collections often occupy the entire top 10 downloads for language resources on iTunes U in the UK.

4.2 Methods

The user survey was created using Surveymonkey and a link to it was placed on all the individual pages as well as the home page of iTunes U at the OU. The link to the survey was active for 21 months (August 2009 to April 2011). Almost 95% of the responses were collected within the first 12 months. There are several reasons for this: in August 2010 the display of external links on iTunes U changed, and this made the link to the survey less prominent. Also, iTunes U does not display hyperlinks to users who access iTunes U directly from a mobile device. Access to iTunes U from mobile devices grew immensely during the time that the survey was active, another reason for the drop in respondents.

In total, 2129 responses were collected. Participants were asked whether they use the iTunes U resources mostly for learning or mostly for teaching. Respondents who indicated that they use the iTunes U resources mostly for teaching (238) were eliminated from the data (n=1891). Of these, 455 (24.06%) selected language learning as the main category of iTunes U resources they download, whereas the number of non-language learners was 1436 (75.94%). The data were statistically analysed using SPSS 20. Given the exploratory nature of the research questions, the data analysis used descriptive statistics only.

5 Results and discussion

The responses are presented below in five sections: personal information, studies and interest in iTunes U language resources, use of iTunes U resources, opinion of the iTunes U resources, and taking their iTunes U learning further. The results for language learners (LL) will be presented in comparison with those of non-language learners (NLL) where relevant. As they are presented, the results will be discussed in terms of relevance, how they compare to the hypotheses made and previous research and literature on the subject.

5.1 Personal information

The gender split from the survey participants between LL and NLL is presented in table 1. Some percentages do not add up to 100 as some participants (0.9 of total) chose not to reveal their gender. Presented below these are the average gender split in UK Higher Education Institutions for LL and overall (HESA, 2012).

	Male	Female
LL	52.5%	46.6%
NLL	56.4%	42.7%
Average UK HE LL	30%	70%
Average UK HE overall	43.6%	56.4%

Table 1: gender split.

A high proportion of respondents in many previous podcasting research studies was female (e.g. Bolliger et al, 2010; Manochehri et al, 2012; O'Bannon et al, 2011). The male / female ratio for the respondents in this study is not consistent with these past

studies as the results suggest that podcasting in general appeals more to males than females, as had been suggested in hypothesis 1. This could be interpreted as a sign that podcasting is a format that can make languages more attractive to male students. However, as table 2 shows, whilst the gender split by age between LL and NLL confirms that iTunes U resources in general - not for language learning - attract more males than females (NLL males outnumber NLL females in every age bracket except "under 15") this is not the case for language learning iTunes U resources. Language courses in Higher Education are dominated by females (as shown table 1). For the LL respondents of this study the proportion of male/female users is not as marked and the results vary with age: the proportion of females is higher than that of males for the under 18 and the 35-44 age brackets, even in the 19-24 and 25-34 brackets, and lower for respondents older than 45.

Age	**Age LL**	Male LL	Female LL	**Age NLL**	Male NLL	Female NLL
Under 15	**0.9%**	25%	75%	**1.5%**	40.9%	54.5%
15-18	**6.4%**	41.4%	58.6%	**5.8%**	71.1%	26.5%
19-24	**11.4%**	50%	50%	**15.5%**	61.7%	37.8%
25-34	**18.2%**	48.2%	48.2%	**20.2%**	57.2%	42.1%
35-44	**19.3%**	47.7%	52.3%	**21.3%**	54.9%	43.8%
45-54	**18.5%**	64.3%	34.5%	**19%**	57.1%	42.5%
55-64	**18.2%**	54.2%	45.8%	**10.5%**	55%	45%
Over 65	**7.0%**	59%	40.6%	**6.2%**	36%	61.8%

Table 2: age of LL and NLL and gender split between them.

As stated earlier, most studies into podcasting as a teaching and learning tool have been carried out with traditional internal learners (teens to early 20s), with the exception of that of Hürst, Welte and Jung's (2007). The age of the external users who took part in their study ranged from 17 to 53. Overall, despite the hypothesis that iTunes U would appeal to younger learners (hypothesis 2), the highest proportions of respondents are quite evenly spread in the age brackets between 25 and 54 for NLL (all above 19%). Language learners are overall older than NLL (with the exception of a small percentage in the 15-18 bracket) and have a much higher proportion than NLL in the 55-64 age bracket. The reason for this may be that informal language learning appeals more to older generations who did not have the opportunity to learn at a younger age and now have opportunities to travel abroad and use some language, but this is speculative.

Cross-referencing the data for age and gender shows that among language learners, females outnumber males in the under 18 bracket; in the 19-34 bracket they are level, and in the over 35 ranges male users are older than female users. This suggests that the stereotype whereby podcasting technology appeals more to men than women applies to older generations only and the trend is reversed for younger users, although other factors – such as nationality or cultural background – may have an effect.

The download data (figure 1) show that approximately 30% of downloads originate in the USA and Canada, and the UK only accounts for around 10%. The respondent percentages for geographical location are quite different: 34.8% of all respondents live in North America (USA and Canada), 33.4% in the UK, and 17.8% in another European country. Geographical location among respondents is considerably different for LL and NLL (see table 3). Countries such as the UK and Australia/New Zealand feature lower in the list for LL than they do in the NLL list (in the UK the percentage drop is over 10%). This seems to confirm the tendency to give more importance to language learning in non-English-speaking countries and less importance in English-speaking countries other than the USA.

Rank	LL	NLL
1	USA / Canada (35.4%)	UK (36.6%)
2	Europe (except UK) (23.5%)	USA / Canada (34.6%)
3	UK (23.3%)	Europe (except UK) (16.1%)
4	Central / South America (5.5%)	Australia / NZ (4.1%)
5	Asia (inc Japan) (5.5%)	Asia (inc Japan) (3.3%)
6	Australia / NZ (3.7%)	Central / South America (2.6%)
7	Other (2.2%)	Africa / Middle East (1.6%)
8	Africa / Middle East (0.8%)	Other (1.2%)

Table 3: Ranked geographical location of respondents

Hypothesis 3, regarding employment status, was that students would represent the highest proportion of users of iTunes U resources but that there would also be a considerable number of participants who are retired. The data presented on table 4 contradict both these hypotheses. Participants in full or part-time paid employment (including self-employed) account for 58.5% of respondents, whereas students only account for 17.7% of the total. In addition, only 11.9% of participants are retired.

Occupation	LL	NLL
In full-time paid employment	40%	40.3%

Student (full time)	16.6%	15.1%
Self-employed/freelance	11.9%	11.1%
Retired	10.8%	7.9%
In part-time paid employment	6.6%	6.8%
Unemployed	4.6%	5.4%
Other	3.5%	3.3%
Prefer not to say	2%	1.7%
Family responsibilities	1.5%	3.3%
Voluntary work (including charitable work)	1.3%	2%
Student (part time)	1.1%	3%

Table 4: participant occupation.

The differences between LL and NLL are minimal here, except for a slightly higher proportion of retired people using language resources, as the results presented on table 2 had revealed.

5.2 Studies and interest in iTunes U language resources

Participants were asked whether the resources they download from iTunes U at the OU are the main source of learning for their chosen subject. For 89.6% of NLL, the resources are additional to other learning they do, leaving 10.4% for whom the iTunes U resources are their main source of learning. This appears to be consistent with previous research which claimed that most users utilise podcasting resources as supplementary materials. For language learners, the proportion of respondents who consider the iTunes U resources their main source of learning is almost double (19.5%), whereas the remaining 80.5% supplement their studies with the iTunes U resources.

The next question in the survey related to whether participants are currently enrolled on a course in the subject: 29.9% of NLL are, whereas 70.1% are not. Once again language learners are different: 21.5% of respondents are enrolled on a course and 78.5% are not. Of those who are not enrolled on a course in the subject, 52.4% are considering taking one (in the case of NLL the figure is 54.4%).

A possible explanation for these results is that languages are a subject area with a large aural component. It makes sense that language learners are almost twice as likely to use podcasts in order to learn. Languages are also a subject area where many

people undertake autonomous study, which may also be a reason for the higher proportion of independent learners.

Regarding users' interest in podcasts, Hürst, Welte and Jung's research found that their participants' motivation for listening was different depending on whether they were internal (enrolled on a course at the institution that provides the podcasts) or external (interested public) learners. Whereas internal learners took part in their podcasting activities for credit, external learners did it mostly out of personal interest, although education and work featured among their reasons too. The results of this study find similar results (table 5), and the comparison between LL and NLL shows that there are more users who download for personal interest and fewer users who are currently studying the subject for LL than for NLL. This result supports the previous suggestions that language learning is perceived as a subject that can be learnt independently, perhaps for travel or leisure reasons.

Interest in podcasts	LL	NLL
Personal interest	78.9%	69.5%
Relevant to current studies	11.8%	19%
Relevant to profession	9.3%	11.5%

Table 5: interest in podcasts.

5.3 Use of the iTunes U resources

Participants were asked if they download individual files or subscribe to whole iTunes U collections. On the whole, most respondents tend to do both (46.9% LL / 46.4% NLL). Language learners report a slightly higher tendency to subscribe to collections (23.3%) than NLL (19.3%) and consequently a lower tendency to download individual files (29.7% LL / 34.3% NLL), but there is no marked difference in downloading habits.

As discussed in section 2, previous research on actual use of podcasts for internal learners found little evidence of resources being transferred to mobile devices. The results of this study show that this is not the case for the participants in this study (table 6).

Transfer to mobile device	LL	NLL
Always / Most of the time	70.2%	62.2%

Sometimes	14%	17.6%
Rarely / Never	15.8%	20.1%

Table 6: transfer to mobile devices.

At the time the survey was launched, iTunes U content could not be downloaded directly to mobile devices (even though iTunes commercial content could). Instead, it had to be downloaded using a desktop or laptop and then transferred to a portable media player if the user wanted to listen to the content elsewhere. This changed halfway through the survey. The results should not be affected, however, because (as pointed out in section 4) the vast majority of responses (95%) was gathered within the first 12 months of the data collection. The mobile aspect of podcasting through iTunes U is corroborated by the fact that many users listen on portable devices (table 7).

Where do you listen	LL	NLL
Portable device	62.7%	54.9%
laptop or netbook	26.3%	27.3%
Desktop computer	11.1%	17.8%

Table 7: devices used for listening to podcasts

These results fit with hypothesis 4 about transfer to mobile devices presented in section 3. The data presented on tables 6 and 7 suggest that language learners are more likely to transfer to and listen on a portable device than NLL. There is not enough data available to ascertain whether this is due to the differences in the personal profile of language learners (e.g. their geographical location, age or gender).

Another difference between participants in previous research and participants in this study is how the listening activity is perceived. Previous research had found that learners made time to listen to podcasts and considered listening an academic activity. They often took notes too. The results of this study show that, although listening is the main activity for 40.1% of LL and 44.5% of NLL, more respondents listened as part of another activity, such as exercising, doing housework or travelling (table 8).

Is listening	LL	NLL
Main activity?	40.1%	44.5%
Part of another activity?	59.9%	55.5%

Table 8: listening as the main activity or not

Despite the high level of listening on mobile devices, the hypothesis (number 5) was that, because they might be more prone to focusing on form, language learners would be more likely to take notes and use the transcripts provided than NLL. The results, however, show that few users take notes regularly and most say they rarely or never take notes (table 9). This contradicts previous research that suggested that there was a correlation between accessing podcast content and taking notes (McKinney et al, 2009). There were no major differences between LL and NLL. This, and the fact that learners listen while doing other activities, suggest that the language learners who use the iTunes U resources may not be engaging in focused listening.

Do you take notes as you listen?	LL	NLL
Always	3.4%	2.9%
Most of the time	7.8%	8%
Sometimes	32.9%	34.4%
Rarely	31.1%	27.3%
Never	24.9%	27.4%

Table 9: note-taking

The use of transcripts might also be considered evidence of focused listening. Language learners in this study are indeed more likely to download them and read them as they listen than NLL. LL also find the transcripts more useful than NLL (see table 10).

Do you download transcripts?	LL	NLL
Always / Most of the time	38.6%	21.3%
Sometimes	29.3%	27.4%
Rarely / Never	32.1%	51.2%
Do you read the transcripts at the same time as you listen?		
Always / Most of the time	33.2%	20.7%
Most of the time	21.29	14.4%
Rarely / Never	23.9%	42.7%
Do you find the transcripts useful?		
Yes	72.9%	65.9%
No	1%	2.2%
Sometimes	26.1%	31.9%

Table 10: use of transcripts. Replies from respondents who ticked "never" in the first question were excluded from the subsequent two questions.

The data do not allow us to draw conclusions about whether when these language learners engage with the content they are focusing on meaning or form (or – most likely – both to some degree). The transfer to and use on mobile devices, the low use

of transcripts and the fact that many respondents listen as part of another activity suggests that many of the learners are listening to the language materials as a casual activity.

5.4 Opinion of the iTunes U resources

Hypothesis 6, regarding whether respondents think listening to the iTunes U resources is helping them learn the language and their rating of the quality of the materials, was that the responses would be very positive. They are. In response to the question “Do you think that listening to the podcasts is helping you learn?” 97.20% of LL selected “yes” and only 2.80% selected “no”. The responses from NLL were very similar (98.3% positive / 1.70% negative). Research on learning through podcasting has so far produced mixed results: as stated in section 2, most researchers have concluded that podcasting is useful as a revision tool, but have reservations about its use for independent learning. In contrast with this, the results from this study suggest that podcasting through iTunes U can provide a useful source of learning to independent users as well as those supplementing their learning from other sources with iTunes U materials.

Language learning is an activity that lends itself to feeling that you’re learning just by engaging with the materials. Most people understand that exposure to the target language is beneficial and audio and video resources are often used in the language classroom. Therefore, it might be expected that LL would be more positive about the iTunes U resources than NLL. Table 11 shows that there are some differences between LL and NLL when they are asked to rate the quality of the materials they listen to. Language learners rate the materials less positively, with fewer respondents rating them as “very good” and more rating them “OK” (although both positive categories together add up to a very similar percentage). Other ratings (variable quality and negative) received similar responses from both LL and NLL.

Quality of the materials	LL	NLL
Very Good / Good	80.1%	86.3%
OK	17.8%	10.6%
Not so good / Terrible	0.9%	0.6%
Variable quality	1.2%	2.5%

Table 11: rating of the quality of the OU on iTunes U podcasts.

The reasons for these differences between LL and NLL are hard to ascertain. Perhaps the fact that language learning is perceived as something that learners can engage with autonomously leads to higher expectations of the resources available on iTunes U.

5.5 Taking iTunes U learning further

The final section in the survey asked whether users would consider paying for content and whether they would be interested in some sort of qualification based on the iTunes U content. Hypotheses 7 and 8 were that very few people would want to pay for content, and there might be limited interest in a qualification. The results showed the opposite: some 49.7% of LL respondents say they would be willing to pay (at the usual iTunes song price of US$0.99, £0.79 or €0.99), and 68.3% say they would be interested in a qualification (among NLL 43.5% would be willing to pay and 69.3% show interest in a qualification). This unexpected result suggests that podcasting could be a source of revenue for content developers (some language learning providers already offer free podcasts but charge for related transcripts, activities and tuition – cf. Rosell-Aguilar, 2007).

6 Limitations

As most research, this study is affected by a number of limitations. The large drop in participants after the first 12 months that the survey was active (for the reasons explained in section 4.2) suggests that a similar study may not be replicable in terms of quantity of responses. Also, the data collected are self-reported, which makes the responses subjective to some extent. The respondents who took part in the survey represent a self-selected sample, clearly interested in iTunes U resources. From this we can assume they have access to devices that can play the resources and possess a certain degree of digital literacy as well as a positive attitude to learning through iTunes U resources. It is probably safe to assume that these characteristics are common to the majority of iTunes U learners, though. In addition, the hugely positive response to whether users think that the iTunes U resources they listen to are helping

them learn must be tempered by the fact that this perceived learning is self-reported and unquantifiable.

Whilst it would have been very useful to supplement the study with further research, such as interviews with a number of the respondents, it was felt that asking participants to provide contact details might dissuade some from taking part and therefore impact on the number of responses collected. Also, given the wide geographical spread of respondents, it would have been difficult to carry out interviews with participants from different time zones.

7 Further research

Given the limited availability of previous research on external use of iTunes U as a language teaching and learning tool, the scope of study has been exploratory and mainly descriptive. Research into this field needs to progress and go deeper in other areas such as whether the language that is being studied makes a difference in user attitudes and preferences.

Since respondents have chosen to learn through iTunes U resources, it follows that they must have a preference for or at least be comfortable with an auditory learning style. It would be worth researching what effect the delivery through this medium has on learners who have a different learning preference. Following on from this, it would be worth conducting further research into the podcast listening practices of language learners following up the information that this study has revealed: what are the differences between those who listen with transcripts and those who listen without them? Between those that listen as a main activity and those who listen on the move? Do users listen to the entire podcast as a whole or do they pause, rewind or skip? Do they listen to the same podcast once or several times to improve comprehension? Whilst some of these issues have been covered in small studies (e.g. Gromik, 2008), there is a need for larger research projects into them.

So far, research into podcasting as a language learning tool has been mostly quantitative and focused on the learning of pronunciation. More qualitative studies are needed to find out more about this and other areas of language learning: whether this

learning method leads to improved comprehension of the language, improved pronunciation and / or intonation, knowledge and retention of grammar and vocabulary, and an understanding of the cultures of the target language, either as supplementary material or as the main source of learning. In addition, it would be interesting to follow up whether language learners who use the podcasts engage in focused listening or not, as the findings of this study are inconclusive in that respect.

8 Conclusion

This paper has reported on the first major study into language learning resources delivered through iTunes U for learners external to the institution that provides them. It had been argued (Cebeci & Tekdal, 2006; Evans, 2008) that podcasts make materials accessible to a wider diversity of learners, but because most studies carried out had used internal learners as participants, the research carried out so far had not shown major differences between podcasts users and traditional students. The results of this study have provided the first profile of the iTunes U language learner and shown that learners in this context are different from the internal users that were profiled on previous research into podcasting as a teaching and learning tool.

The results show that language learners who use iTunes U resources from the OU are mostly middle-aged and that there are more males than females, although there is a larger proportion of female respondents among the younger users. There are relatively few in full or part-time education and the majority of participants are in full or part-time employment. Most users download resources for personal interest and nearly a fifth use the iTunes resources as their main source of learning. Users have a high opinion of the quality of the materials and believe they help them to learn. The results also show that over 70% users (most of the time or always) transfer language learning iTunes U resources to a mobile device and over 60% listen to them using mobile devices whilst taking part in other activities, in sharp contrast with previous research. This evidence supports considering iTunes U a service that can enable mobile learning and, therefore, providers should take mobile learning design principles into consideration when planning the delivery of resources through iTunes U.

The data obtained have also shown that language learners have some practices in common with non-language learners, but some of these vary. While some of the results confirmed the hypotheses that had been previously outlined, others have provided evidence to the contrary.

The suggestion in section 5.3 that iTunes U language learners listen to the resources in a casual way may appear to counteract the potential benefits of focusing on form. This is not necessarily a negative thing: listening to target language materials in an unfocussed manner rather than focusing on form or meaning is a valid activity as well: in doing so, learners may get used to the rhythm and sounds of the target language and notice intonation patterns, cognates or grammatical structures through incidental learning.

Although the research was carried out on the users of a distance learning institution that provides resources on iTunes U for independent learners, it is likely that the results will largely apply to external learners who use resources from other institutions as well. One significant difference between OU on iTunes U resources and those of other providers' is that the OU materials are designed as relatively small learning chunks (as described in section 4.1). This appears to be something that users like, given the huge popularity of OU on iTunes U resources, and may be particularly useful for language learning resources.

It is undeniable that podcasting generates interest in the institutions providing such resources (as evidenced by the increase in traffic towards their websites from the iTunes U pages), although there is no proof that this interest translates into further action (such as registering for a course). However, the unexpected positive reaction towards paying for content and offering qualifications based on podcasting resources opens up new revenue-generating possibilities and directions for Higher Education institutions, both in the field of language learning and beyond. This, however, would be against the principles of delivering free educational content and removing elitism from education. An alternative to offering qualifications would be to offer online badges for lifelong learning, which – although without validity in many formal contexts – would recognise the effort that learners have made and might encourage further study.

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Abstract

Despite the fact that portability was perceived as one of the major benefits of podcasting as a teaching and learning tool, little evidence has been found of users taking advantage of this feature for academic use. This paper reports on a major study (1886 responses) of iTunes U users. The analysis compares the responses of those participants who use static devices to play the materials they download with those of users who utilise mobile devices. The results show that more users play iTunes U materials from mobile devices than static devices. Users share some similarities in their use of podcasts but some marked differences as well, in contrast with previous research. We argue that different perceptions and practices are based on whether the users are formal or informal learners and discuss the implications for the use of podcasting as a mobile learning technology.

Keywords: Mobile Learning, Podcasting, iTunes U, Lifelong Learning, e-learning, Informal Learning

1 Introduction

When, 10 years ago, podcasting started to become a popular means of producing and delivering audio-visual materials, many academics began to explore its potential as a teaching and learning technology. Researchers identified a number of potential benefits and high among them was portability: the ability to make learning available anytime and anywhere (Blaisdell, 2006; Cebeci & Tekdal, 2006; Clark & Walsh, 2005; Evans 2008). In other words: podcasting was seen as a technology that would enable mobile learning.

A podcast is an audio or video file that is distributed over the internet, normally through a subscription service as part of a collection of files. These media files appear in a variety of formats (most commonly mp3s for audio and mpeg for video, although other formats such as m4a, m4v and mp4 are also used), and can be played on a number of devices (portable and static). Whilst some file formats used to be unique to specific devices, creating a barrier for users to download resources from certain podcast

repositories, most devices are able to play a wide variety of file format nowadays. Although podcast collections sometimes include additional resources such as PDFs, which can be downloaded alongside the audio or video files, these additional resources are not usually considered podcasts as such.

Definitions of mobile learning have evolved with the emergence of different types of devices and the affordances they provide. An early definition of mobile learning stated that it takes place “when the learner is not at a fixed, predetermined location, or when the learner ‘takes advantage of the learning opportunities offered by mobile technologies’” (Kukulska-Hulme, 2005, p. 1). Those learning opportunities have increased vastly in the last few years with the proliferation of devices that can afford mobile learning (mobile phones, personal media players, smartphones, small tablets) and with the advances in technology that allow storage of content (larger memory at affordable prices, cloud computing) and connectivity (higher download speeds, lower cost). Some definitions of mobile learning have been device-centric, whereas others describe mobile learning as “mediated by mobile devices, characterised by the mobility of the learners, and/or the mobility or accessibility of the content considered” (Hamm et al, 2014, p.3). Mobile learning achievements include enhancing learning, reaching out to remote learners, theory building, motivation and community building, although not without challenges (Traxler, 2011). The rapid growth in availability and popularity of mobile devices have made them ubiquitous in many territories, with some arguing that “as mobile devices become even more powerful and versatile, we are likely to see more users make them their primary, perhaps their sole computing devices.” (Godwin-Jones, 2011, p.8). Podcasting is an example of didactic mobile learning, defined as “learning from mobile educational material (…) in a way that responds to the potential and the limitations of mobile devices” (Kukulska-Hulme & Traxler, 2005, p. 26). Although advances in connectivity mean that podcast users can also engage in discursive mobile learning, based on interaction among mobile learners, didactic mobile learning remains the most common way users engage with podcast materials.

Many of the recommendations of mobile learning practice apply to the use of podcasting for learning. These include the provision of resources that can be used autonomously, appropriate length, taking screen size into consideration in the design of resources (which applies to video podcasts) and chunking knowledge as

independent learning objects to facilitate processing of information (Ally, 2004). However, these and all other affordances that podcasting can bring can only be considered mobile learning if users access podcasts from their mobile devices rather than from their desktop or laptop computers. When learners listen to podcasts through their mobile devices, they integrate their learning into their lifelong learning processes, as advocated by theories of informal and lifelong learning, which view learning as something that can happen in everyday life outside the classroom, whether intentionally or accidentally (Naismith, Lonsdale, Vavoula & Sharples, 2005). Podcasting technology also facilitates 'just in time learning' "where learners can often take advantage of unexpected free time since they often have their devices with them" (Evans, 2008, p. 492).

Users of mobile devices such as mobile phones tend to utilise them in short windows of time throughout the day rather than in dedicated sessions. A report by Ofcom (the independent regulator and competition authority for the UK communications industries) claims that 81% of smartphone users keep their device switched on all day. It also reports that

> over half (51 per cent) of adults and two thirds (65 per cent) of teenagers say they have used their smartphone while socialising with others, nearly a quarter (23 per cent) of adults and a third (34 per cent) of teenagers have used them during mealtimes and over a fifth (22 per cent) of adult and nearly half (47 per cent) of teenage smartphone users admitted using or answering their handset in the bathroom or toilet. (Ofcom, 2011, para 9)

The concept of taking the opportunity to learn during short free time periods has implications for mobile learning design, as learners are less likely to engage with resources that require a long time to process or deep concentration. In 2007, Kenning speculated that Mobile learning could be expected to be "a highly fragmented experience liable to be fraught with distractions" (p. 194). Stone's (2009) concept of Continuous Partial Attention (the process of paying simultaneous attention to a number of sources of incoming information, but at a superficial level) is one that applies to engagement with such mobile devices for some users. There is a wide variety of podcasting formats, and some (shorter, more concise) may therefore be more likely to

engage the learner than others. The availability of new affordances in such devices, while having great potential, does not ensure that the potential will be exploited: “just because a device can be used for something it doesn’t mean it will be used for that purpose” (Bell, 2008, p. 182).

The use of podcasting for learning fits better with the principles of mobile learning since smartphones and tablets became available and widely owned, as these devices combine access to podcast aggregators such as iTunes, an internet connection which allows direct download, and the capability to play the files downloaded.

Apple’s iTunes store has become one the most popular podcast aggregators worldwide. In 2007 Apple launched iTunes U, a repository for educational content provided at first by universities only, later by other institutions such as museums or further education colleges. Over one billion iTunes U resources have been downloaded between its launch and February 2013 (Apple press release, 2013). iTunes U is multiplatform, not exclusive to Apple operating systems, and can be used both on desktop computers and mobile devices. Apple referred to iTunes U as ‘the university in your pocket’. This slogan, however, soon appeared not to be true, as research projects involving the use of educational podcasts suggested that these were being used on desktop computers rather than mobile devices.

This paper will review past and current literature on podcasting as a mobile learning technology and present a number of key questions about learners’ use of podcasts. It will then present the data collected from a large study into users of iTunes U resources, discuss them and present conclusions about whether the delivery of media files through such platforms can be considered a mobile technology.

2 Podcasting as a mobile technology for teaching and learning

A mobile technology?

Even though many researchers were quick to identify the affordance of mobile learning as a benefit of podcasting technology, little evidence was available to confirm this at the time. A number of empirical data began to arise from early studies into actual use

of podcasts among learners, some of which addressed the issue of mobile use. Two different projects were carried out in 2004 to provide podcasts and mobile devices to learners, one in Osaka Jogakuin College in Japan (McCarty, 2005), and one in Duke University, in North Carolina, U.S. (Belanger, 2005). Both studies reported very positive first impressions among learners, perhaps due to the novelty factor and excitement that surrounded the initiatives. Among the first projects carried out in Europe was the IMPALA project from the University of Leicester in 2006. Their pilot project reported that only 20% of participants (n=24) loaded podcasts to a mobile device (Edirisingha & Salmon, 2007). A later study (Salmon & Edirisingha, 2008) revealed that only 7% of participants (n=35) transferred files to their mp3 player. Many other studies coincided in this low transfer of podcasts to mobile devices: a report of a research project from Charles Sturt University in Australia (n=39) stated that "an overwhelmingly vast majority preferred to listen to the podcasts *using a desktop/laptop computer* [authors' emphasis]" (Lee & Chan, 2007, p. 210). Copley (2007) reported that 94% of his students (n=84) played podcasts on their PCs, and Malan (2007) found that the percentage of learners using iPods to listen to mp3s was 29% compared to 71% who used computers. Similarly, Evans et al (2008) reported that 20% of the participants in their study of podcasts used a portable device whereas 80% listened using their PCs. A larger study (n=256) by Bennett (2008) also found that the majority of students listened on computers rather than mobile devices.

Later research projects continued to find a similar trend. McKinney et al (2009): reported that only 20% of students listened to podcasts on a mobile device. Carvalho, Aguiar and Maciel (2009) concluded that their students didn't take advantages of mobility either. Walls et al (2010) stated that "most students indicated that they use a computer for playing educational related files" (p. 375) and O'Bannon et al (2011) concluded that participants mostly downloaded podcasts through a VLE, preferred to listen at home and did not transfer to mobile devices. Kazlauskas and Robinson (2012) also challenged the assumption that students listen to podcasts if they are made available to them and presented evidence that many students did not use podcast resources. They consider it imperative not to ignore or neglect the student population who reject podcasts.

Some of the results from these studies were affected by mobile device ownership. In some of the earlier research projects, mp3 players were loaned to students, who were only relatively familiar with them and with podcasting in general. For projects were participants were not given devices, ownership of these was not as widespread as may be assumed nowadays: Dias et al (2007) carried out a study of 1248 Japanese university students and found that only 55% used mp3 players regularly. In a study by Walls et al (2010), 72% of participants reported owning a mobile device that could be used to play mp3 files, meaning that almost a quarter didn't have access to mobile device. Devices have since become cheaper and more popular, and later studies have found a larger proportion of mobile device ownership: 100% of participants in Bradley and Holley's (2011) study owned a mobile phone, of which 80% were smartphones (their participants were mostly under 25). In a US study of undergraduate students in 2012, 67% of students reported using their smartphones for academic purposes, up from 37% in 2011 (Dahlstrom, 2012).

There is a disparity between the low transfer reported and the users' opinions of the mobility potential of podcasts. Whilst many users value the affordance of portability, they do not appear to actually use it (Malan, 2007). Evans (2008) reported that 79% of the students who took part in his study agreed that it was important to be able to listen to podcasts when and where they want. When asked to provide further details, however, only a quarter of respondents actually stated that they listened to podcasts whilst travelling. Bollinger et al (2010) claimed that their students liked the portability that podcasts can afford, but did not provide any data on whether their students actually had listened on a portable device. Although some claim that "the portability of a podcast is an important factor in its getting used by students" (Abdous et al, 2012, p. 44), as Walls et al conclude: "portability, however, like any technological provision, is only convenient if people actually use it" (Walls et al, 2010, p. 372). Not all research findings support this, however. An international study across five different countries and contexts found that "when students are offered appropriate mobile resources then they will make use of them" (Kukulska-Hulme et al, 2011, p. 32).

The low mobile use of podcasts is therefore an issue that has appeared consistently on the research in this field, leading some to state that "students did not take full advantage of this technology as they do not use mobile devices to listen to podcasts"

(Carvalho, Aguiar & Maciel, 2009, p 139). To answer why students did not subscribe to podcasting syndication services, Lee et al (2009) suggested lack of knowledge of the technology, fixed models of interaction with resources, and the type of content or lack of regular updates among others. They proposed further research into the volume and nature, type and use, and authorship of the podcast content. A possible explanation for this lack of use of podcasts using mobile devices is that many of the research projects that report it were carried out in a context where the podcasts were provided by a tutor to their own students for a specific purpose (homework, pre- or post- class activities) through the institution's Virtual Learning Environment (VLE) and not a podcast aggregator. In some cases, students had to complete activities based on the podcasts they had listened to. It makes sense that students would listen to the resources provided through a VLE whilst logged on rather than transfer them to a mobile device for later listening. In addition, it is likely that any follow-up activities would also be VLE-based, making the decontextualisation of the resources from their source detrimental, a powerful reason not to transfer podcasts to a mobile device or listen on the go.

The question of whether podcasts can be considered a mobile learning technology is therefore debatable, and one whose answer affects not only the identified potential of podcasting as a teaching and learning tool, but has an effect on design and use.

An academic activity?

Another issue that many of the studies on podcasting as a teaching and learning tool highlighted was the fact that engaging with podcast resources was perceived as an academic activity. Learners value the flexibility that mobile learning can afford: some 59% of the respondents in Bradley and Holley's (2011) research placed importance in the ability to learn at any time in any place, as had 79% of the participants in Evans' (2008) study. Despite this, practice is different from impressions. Edirisinha and Salmon (2007) found that 47% of their respondents listened to the podcasts they were provided with without doing anything else (i.e. focusing solely on the podcast material and not as part of another activity), and 33% took notes whilst listening. McKinney et al (2009) found that taking notes while listening to the podcasts significantly achieved better grades, and students who did so also tended to listen multiple times. Lee and

Chan (2007) reported that most of their participants set aside time to listen to study podcasts. Respondents in the study by Evans (2008) did not multi-task either, as the majority of students did not listen to podcasts while doing something else. Similarly, in a study of Japanese students' use of mobile phones for language learning, Stockwell (2013) found that only 15.4% of students used their devices whilst in transit. Some research has been carried out on the effect of multitasking on learning (Clarebout et al, 2008; Coens et al, 2011; Doolittle & Mariano, 2008), and the studies found that students in stationary conditions retained information better than those who were walking or jogging, although it is hard to prove that this was a causal correlation.

The lack of transfer to mobile devices and the perception of listening to podcasts as an academic activity appear to contradict the mobile and informal qualities that podcasting was supposed to bring to learning. Bennett (2008) concluded that

the unique properties of a podcast (i.e., a regularly updated series of episodes that can be subscribed to and listened to on a portable mp3 player) that were initially put forward as reasons why podcasting may be an effective way of helping students to learn (Campbell, 2005) actually appear to be relatively unimportant when using a podcast to enhance face-to-face campus-based courses (p.8).

Once again, given the context of podcasts made available to students by their own instructors as part of their home or preparation work, it is hardly surprising that students perceived listening as an academic activity.

Another relevant debate in the literature on podcasting as a teaching and learning tool concerns the view of podcasting as supplementary to formal learning. Many researchers found that students rated podcasts highly as supplementary materials, to catch up on missed lectures, and as revision tools (e.g., Bennett, 2008; Copley, 2007; Daniel & Woody, 2010; Evans, 2008; Fernandez et al, 2009; Lee & Chan, 2007; Malan, 2007; Walls et al, 2010). Some of these researchers therefore questioned the potential use of podcasts as the main source of learning for their subject or as a replacement for formal learning. In most cases this was linked to the fact that the participants in their own research used the podcast resources as supplementary to the main teaching they were enrolled in at those institutions where the research was undertaken.

The question of whether listening to podcasts is an academic activity, with users focused on the content as they would with other learning resources such as books, or a more informal activity closer to infotainment could also have an effect on how podcasts are designed in terms of content and format, and how these resources will be used.

Different learners, different practices

The target learners for mobile learning have been classified into school children and their carers; higher education students; young adults not in education or work; the underserved in development contexts; people in the world of work; communities, friends and families (lifelong learners); and learners with special needs and disabilities (Kukulsa-Hulme, 2013, pp 149-151). Some crucial variables in the research into podcasting as a mobile technology may depend on the type of learner who downloads podcasts, their reasons for doing so, and the method they use to access them. Research by Hürst, Welte and Jung (2007) provided evidence that different types of learners engage with podcasts in a different way. They found that 'internal' learners (enrolled on a course and usually young) used podcasts in a different way to 'external learners' (interested public outside the university), who found the same podcast resources on iTunes U. The age of these 'external' learners ranged from 17 to 53. They also differed in their motivation for listening: 'internal' learners listened for credit as part of the activities in their regular courses. In contrast, 'external' learners listened mainly because of personal interest with some indicating that they listened because of education or work reasons. Hürst et al. concluded that the added value of podcasting is mobility and whereas 'internal' learners tended to access podcasts on traditional devices, 'external' learners took advantage of RSS. Similarly, Heilesen (2010) suggests that there are differences between regular students, who sit in front of the computer and make time to listen, and the interested public, more likely to be multitasking or listening on the move.

The delivery medium of podcasts, hence, may have an effect on the audience they find. It is clear that podcasts delivered through a VLE, usually behind password protection, will only be available for the consumption of students registered at the

institution that hosts the materials (although more and more institutions are offering some of their materials as Open Educational Resources or through MOOCs). When the same materials are made available on platforms such as iTunes U, they find a completely new audience that is unknown to the instructor and the institution, therefore the teachers who provide the materials are 'teaching strangers' (Rosell-Aguilar, 2013a). This new audience, following the findings above, is likely to be part of a different demographic, have different reasons for downloading the podcasts, and engage with them in a completely different way. It is important to put effort into understanding mobile learners, their characteristics and needs (Kukulska-Hulme, 2013).

Research questions

Based on the findings presented above, and the questions they pose, there is a need to know more about who uses podcasts and how. This is related to which platform is used to find and download such resources and the motivations for engaging with them. As stated earlier, most previous literature has focused on podcasts delivered by an instructor to their known audience, but there has been little research into the delivery of such materials through a generic platform such as iTunes U. A major research study into iTunes U users, which this paper is part of, found that they are quite different from those learners that most previous research has focused on, both in terms of their personal profile and their downloading and listening habits. The subjects downloaded also made a difference in the type of audience the podcast resources found (Rosell-Aguilar, 2013a, 2013b).

This paper will focus on the differences between users of iTunes U resources depending on whether they listen to the podcasts they download on a mobile or static device: it will present any differences shown by variables including age, gender, subject, enrolment on a course, reasons for listening, RSS subscription transfer to mobile devices, note-taking, and whether the iTunes U resources are the main source of learning. It will also present similarities in the rating and perception of learning among users of both mobile and static devices.

3 Methods

Context and tools

This study is based on the use of iTunes U resources from the UK Open University (OU). As a distance learning university, the OU has a history of delivering high-quality teaching content online. It is among the institutions which deliver the largest number of iTunes U resources world-wide, with over 65 million downloads between June 2008 and November 2013 (Apple, 2013; Open University, 2013). Despite being best known in the UK, nearly 90% of its iTunes U materials are downloaded from outside the UK.

This study is part of a larger research study into the use of iTunes U. The other two strands of the larger study focused on the profile of the iTunes U learner in general (Rosell-Aguilar, 2013a) and on its use for language learning, as languages is the most downloaded subject from iTunes U at the OU (Rosell-Aguilar, 2013b). The survey contained questions about the users' personal profile, their download habits, how they used the resources they download and their opinion of these materials, among others (for fuller details of the survey and the results arising from the answers to these questions, see Rosell-Aguilar, 2013a). Although there is some overlap, this third strand focuses solely on the results from the point of view of podcasting as a mobile learning technology, which were not included in previous reports.

SurveyMonkey was used to create a survey and gather responses through a link placed on the OU iTunes U homepage and all its collections. The survey ran between August 2009 and April 2011. A total of 2129 responses were collected. The vast majority of responses (95%) was gathered in the first 12 months that the survey ran, as changes to the layout of iTunes U after that time limited both visibility and access to the link to the survey from mobile devices and desktop computers. The data gathered were analysed using SPSS 21.

Participants

Participants were asked whether they used iTunes U resources mostly for learning or teaching. Respondents who responded that they used the iTunes U resources mainly

for teaching (n=79) and those who skipped that question (n=159) were removed from the survey, as this study focused on learners (n=1891). Those respondents who did not own any devices able to play mp3s or video files (n=5) were also removed (n=1886).

Of the 1886 respondents, 1046 (55.5%) were male, 823 (43.6%) were female and 17 (0.9%) chose not to disclose their gender. Distributed by age, 143 (7.6%) were 18 or under, 203 (10.8%) were 19-24, 354 (18.8%) were 25-34, 393 (20.8%) were 35-44, 373 (19.8%) were 45-54, 305 (16.2%) were 55-64 and 114 (6%) were over 65.

The crosstabulation of ages and gender of the respondents is presented in Table 1.

	Male	Female	Prefer not to say
18 and under	54 37.8%	86 60.1%	3 2.1%
19-24	109 53.7%	94 46.3%	0 0.0%
25-34	195 55.1%	155 43.8%	4 1.1%
35-44	209 53.2%	180 45.8%	4 1.0%
45-54	219 58.7%	151 40.5%	3 0.8%
55-64	182 59.7%	122 40.0%	1 0.3%
over 65	78 68.4%	34 29.8%	2 1.8%

Table 1: age and gender crosstabulation.

Respondents were asked where they lived. The US and Canada represented the biggest proportion of respondents (34.8%), closely followed by the UK with 33.5%. The rest were from another European Country other than the UK (17.9%), Australia / New Zealand (4%), Asia (3.8%), South and Central America (3.2%), Africa (0.7%), the Middle East (0.7%) and finally 1.4% lived in other countries.

Table 2 presents the breakdown of occupations. Over half the respondents (58.3%) were employed (either full, part-time or self-employed) and only 18.1% were students (full or part-time).

full-time paid employment	40.2% 756
In part-time paid employment	6.8% 128
Self-employed/freelance	11.3% 213
Voluntary work (including charitable work)	1.8% 34
Family responsibilities	2.9% 54
Unemployed	5.2% 98
Retired	8.6% 162
Student (full time)	15.5% 290
Student (part time)	2.6% 48
Other	3.4% 63
Prefer not to say	1.8% 33
Total	1,879

Table 2: occupation of participants

4 Results

This section will present the overall results with particular focus on any differences between learners who use mobile or static devices. Within this, it will present any differences shown by variables including age, gender, subject, enrolment on a course, and whether the iTunes U resources are the main source of learning.

Participants were asked whether they mostly listen to the iTunes U resources they download on a static device (desktop or laptop computer) or on a portable device (portable media player, mobile phone…). Of the 1733 who responded to this question, 751 (43.3%) listened mostly on a static device and 982 (56.7%) on a mobile device. This variable is used in this section to differentiate static learners from mobile learners, and results will be presented according to this.

The data relating to gender and age of respondents overall were presented in section 3. The gender split among users was identical for users of static devices and mobile devices (45.6% male / 54.4% female).

The breakdown of ages depending on what type of devices they use is presented in Table 3

	Static	Mobile
18 or under	53 41.7%	74 58.3%
19-24	97 53.3%	85 46.7%
25-34	136 41.8%	189 58.2%
35-44	135 37.2%	228 62.8%
45-54	150 44.0%	191 56.0%
55-64	126 43.0%	167 57.0%
over 65	54 52.9%	48 47.1%

Table 3: age of different type of device users

The participants downloaded iTunes U resources representing a large variety of subjects. A number of subjects were downloaded more often than others, with languages, arts and humanities and science in the lead. Figure 1 shows the most popular subjects and the proportion of downloads they represent.

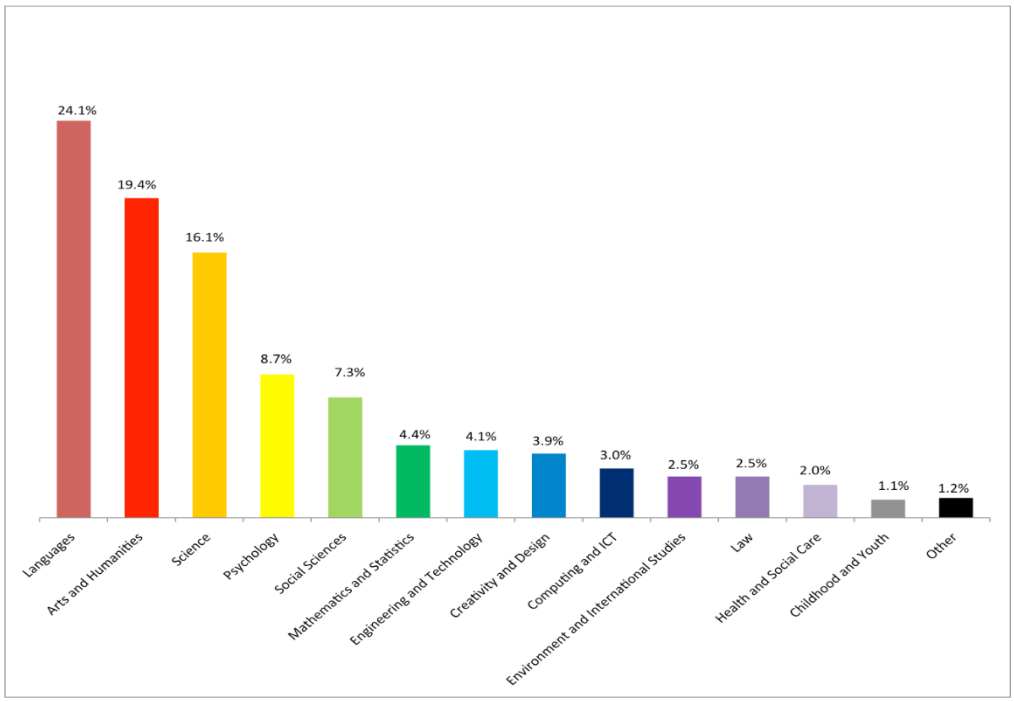

Figure 1: Subjects downloaded

Table 4 presents the breakdown of some of the subjects that participants downloaded from iTunes U and the type of user.

	Static	Mobile
Languages	152 37.4%	254 62.6%
Arts and Humanities	141 41.3%	200 58.7%
Science	145 50.7%	141 49.3%
Psychology	57 37.7%	94 62.3%
Social Sciences	55 43.3%	72 56.7%
Mathematics and Statistics	44 57.1%	33 42.9%
Engineering and Technology	27 40.3%	40 59.7%
Creativity and Design	36 56.3%	28 43.8%
Computing and ICT	27 50.9%	26 49.1%
Law	15 35.7%	27 64.3%
Health and Social Care	12 35.3%	22 64.7%
Other	40 47.1%	45 52.9%

Table 4: subjects and different type of device users

Some 1728 participants responded to a question about whether they were enrolled at a school, college or university on a course in the subject that they downloaded iTunes resources for. A total of 483 (28%) were enrolled whereas 1245 (72%) were not. The difference between users of different types of device was not pronounced: among the users of static devices, 29.6% were not enrolled and 70.4% were. Similarly, 26.7% of mobile device users were not enrolled whereas 73.3% were.

In response to why the participants were interested in the resources they downloaded, 1243 (71.7%) chose ‘personal interest’ as their reason. Some 300 (17.3%) respondents chose ‘relevant to my current studies’ and 190 (11%) chose ‘relevant to my profession’. Table 5 shows the split between users of mobile and static devices.

	Static	Mobile
Personal interest	547 44.0%	696 56.0%
Relevant to my current studies	132 44.0%	168 56.0%
Relevant to my profession	72 37.9%	118 62.1%

Table 5: reasons for downloading and different type of device users

Participants were asked whether they regarded the resources they download as their main source of learning for that subject or whether the resources were supplementary, additional to other learning they do. Of the 1715 participants who responded to this question, 1502 (87.6%) regarded the resources as supplementary and 213 (12.4%) as the main source of learning. Among those who chose supplementary, 44% were users of static devices and 56% users of mobile devices, whereas for those who chose main source of learning, 37.6% were users of static devices and 62.4% users of mobile devices.

A total of 351 (20.3%) users mostly subscribed to the iTunes feed, whereas 573 (33.1%) mostly downloaded individual files. The most common practice for 809 (46.7%) respondents, however, was doing both. Among the remaining 53.4% (923) respondents who expressed a preference for one method over another, 62% (573) mostly download individual tracks and 38% (351) mostly subscribe. Of the 351 respondents who mostly subscribe 35.9% are users of static devices and 64.1% mobile device users, whereas of the 573 who mostly download individual tracks 48.2% are static device users and 51.8% use mobile devices.

Participants were asked if they transferred the resources they downloaded to a mobile device. Some 674 participants (38.9%) responded that they always transferred to a mobile device, 436 (25.2%) that they did so most of the time, 291 (16.8%) did it sometimes, 120 (6.9%) rarely and 212 (12.2%) never transferred the iTunes U resources to their mobile device. The differences between those who use static and those who use mobile devices were very marked, as seen in Table 6.

	Static	Mobile
Yes, always	71 10.5%	603 89.5%

Most of the time	117 26.8%	319 73.2%
Sometimes	242 83.2%	49 16.8%
Rarely	116 96.7%	4 3.3%
Never	205 96.7%	7 3.3%

Table 6: transfer habits and different type of device users

A question on the survey was added to ascertain whether users took notes while they listened. Of the 1651 participants who responded to this question, 49 (3%) always took notes, 130 (7.9%) took notes most of the time, 563 (34.1%) did it sometimes, 465 (28.2%) rarely did so and 444 (26.9%) never took notes. Table 7 shows that, as was the case in the previous question, the differences between static and mobile device users are quite marked.

	Static	Mobile
Always	33 67.3%	16 32.7%
Most of the time	72 55.4%	58 44.6%
Sometimes	252 44.8%	311 55.2%
Rarely	182 39.1%	283 60.9%
Never	171 38.5%	273 61.5%

Table 7: taking notes and different type of device users

Among the respondents who listened to iTunes U resources on a mobile device (n=980), 359 (36.6%) made time to listen and considered listening the main activity they were doing at that time. For 621 (63.4%) listening was part of another activity, such as exercising, doing housework or travelling.

Some 1651 participants responded to a question about whether they thought that listening to the resources they downloaded from iTunes U helped them to learn about the subject. Of these, 1619 (98.1%) answered ‘yes’ and 32 (1.9%) answered ‘no’. The split between static and mobile device users was very much the same as the overall split for those who answered ‘yes’ (42.4% static / 57.6% mobile). In contrast, of the 32

participants who answered ‘no’, 24 (75%) were users of static devices and 8 (25%) were mobile device users.

Of the 1501 participants who responded to a question which asked them to rate the quality of the iTunes U resources they download 609 (40.6%) rated the materials ‘very good’, 665 (44.3%) ‘good’, 184 (12.3%) ‘OK’, 9 (0.6%) ‘not so good’, 1 (0.1%) ‘terrible’ and 33 (2.2%) replied that the quality varies. The differences between device users are presented in table 8.

	Static	Mobile
Very good	273 44.8%	336 55.2%
Good	276 41.5%	389 58.5%
OK	85 46.2%	99 53.8%
Not so good	6 66.7%	3 33.3%
Terrible	1 100.0%	0 0.0%
It varies	20 60.6%	13 39.4%

Table 8: quality ratings and different type of device users

5 Discussion

This section will discuss the results from the survey in the light of previous research, where available. Given the lack of data from any sort of similar survey into iTunes U users for some of the questions, some degree of speculation is used in this discussion. Comparisons are also made with stereotypes about learners and users of technology in general, although these are subjective.

Different learners?

The fact that more participants in this study listened on a mobile device rather than on a static device is the most striking, and one that immediately sets the scene for a picture of a podcast user who is very different from the participants who took part in most previous reports. Participants fitted with some of Kukulska-Hulme’s (2013) target

learners in m-learning (mostly those in the world of work and lifelong learners - also Higher Education students and to some extent young adults not in education or work).

Given that there is often a stereotype that men are more interested in gadgets and technology and more men than women took the survey, one could assume that iTunes U is more appealing to men than to women. Previous results from this project showed that the gender difference among users was linked to age, with women more likely to use iTunes U the younger they are, whereas men represented the highest proportion of users for older students (Rosell-Aguilar, 2013a). Therefore it is interesting to note that the participant profile for the mobile learning strand of this research showed that the split between male and female users of iTunes U was exactly the same for users of mobile devices and users of static devices, indicating that gender and device use are not correlated.

The participants in this study were quite different in terms of age from those who took part in most of the previous studies published, as those were mostly under-25 university students with few exceptions (Hürst et al, 2007; Kukulska-Hulme et al, 2011). There were some age differences between users of static and mobile devices, as shown in table 3. There does not appear to be a consistent pattern, though, as the age range with the most users of mobile devices (62.8%) was 35-44 and users of static devices outnumber users of mobile devices in the 19-24 and the over 65 brackets. Whilst older people are often stereotyped as being less likely to use modern technology and devices, it would seem logical that more users in the over 65 age range might use static devices, as the results show. However, the results contradict the opposite stereotype that younger people are more likely to use new gadgets and technology, given that the 19-24 age bracket was the one with the largest proportion of users of static devices. This, however, may be related to available income rather than preferences.

Not much can be discussed about the preferences for different subjects by users of different types of device, as participants in previous studies took a wide variety of subjects and there was no clear pattern among the participants in this study. In some subjects, the split between users of mobile or static devices was very close (e.g. Science and Computing and ICT both with an almost 50/50 split). Mathematics and

Statistics, and Creativity and Design were the subjects downloaded by a markedly larger proportion of users of static devices. The remaining subjects attracted more users of mobile devices, with Languages, Psychology, Law, and Health and Social Care attracting over 60%. The survey did not ask any further questions that could explain these differences. It may be for reasons of the type of material available for different subjects or perhaps the subjects themselves.

An academic activity?

With regards to enrolment on a formal course on the subject they downloaded iTunes U resources for, the results showed that 72% were not enrolled. This is very different from previous research, which was mostly carried out with students enrolled on courses at the institutions where the research was undertaken. The data here show that only 17.3% of respondents downloaded resources because they were relevant to their studies. It seems therefore that iTunes U attracted more casual or informal learners. Cross-tabulating whether participants were enrolled on a course in the subject they downloaded iTunes U resources for was used as a measure of whether respondents could be considered formal or informal learners. There were no major differences in terms of enrolment between users of mobile or static devices, which suggests no correlation between informal learning and the use of one type of device over another. Interestingly, although the proportion of static device users (44%) and mobile device users (56%) was identical for learners who downloaded for personal interest and for those who do it because the resources are relevant to their current studies, there was a more marked difference among learners who engaged with the resources because they were relevant to their profession (37.9% static / 62.1% mobile). It is worth remembering here that users who downloaded iTunes U resources for teaching purposes were removed from the data analysis, hence this result refers to learners who engaged with the iTunes U content for reasons of professional development. It may be the case that those learners, being mostly employed, have more resources to purchase and use a mobile device, or it could be that the content may be more adequate for practices such as just-in-time learning using a mobile device.

A large proportion (87.6%) of respondents used the iTunes U resources as supplementary to other learning they did. This is consistent with previous research. We can only hypothesise as to why they did so (apart from the case of those 483 respondents who were enrolled on courses on the subject, as they clearly had access to other sources of learning). It may be that these learners were using other podcasts or independent learning resources such as websites or books, given that 71% of respondents used the iTunes U materials for personal use rather than because it was relevant to their professional development or their current studies. Since they were iTunes U users, it makes sense for them not to restrict their own learning opportunities to materials from one single institution. For the 213 (12.4%) respondents who regarded the iTunes U resources as their main source of learning, the proportion of mobile device users was much larger (62.4%) than the proportion of static device users. This also fits with the idea of using iTunes U materials as informal learning that can be accessed from a mobile device on the go or in short convenient instances and is consistent with previous findings which suggested those who study formally do not listen on the move and those who learn informally do.

Previous research on the use of RSS subscription had found very little evidence of subscription. This study found that nearly half of respondents both downloaded individual files and subscribed and of the remaining respondents 38% mostly subscribed. It also found that 64.1% of the respondents who subscribed and 51.8% of those who downloaded individual tracks were mobile device users. There appears therefore to be a preference among mobile device users to subscribe. This is a much higher proportion of subscriptions than previously found and is very surprising. The “subscribe” button is more prominent on the desktop version of iTunes and it might have been assumed that users of mobile devices may want to choose which tracks they download and when they do so to prevent using the limited available storage space on their device and their mobile data for what may perhaps be unnecessary or irrelevant downloads. This, however, is based on the assumption that use of a mobile device signifies the learner is mobile as opposed to a learner preference to use their mobile device regardless of location (e.g. at home).

Mobile use

The question about whether participants transfer the resources they download to a mobile device was worded in such a way because at the time the survey was carried out iTunes offered the possibility of direct downloads to iOS devices, but iTunes U files could not be downloaded in this way. Nowadays this question would ask whether users download files directly to their mobile device or to a static device. Unsurprisingly, mobile device users mostly transferred to a mobile device and static device users in the majority never did. Likewise, static device users were much more likely to take notes.

A sizeable proportion of mobile device users (63.4%) listened whilst they took part in another activity (exercise, commuting, housework). As discussed in section 2, static use has previously been linked to better attainment than mobile use. This study did not look into attainment, but asked respondents to rate the iTunes U resources they downloaded and whether they believed they helped them to learn. The results show that an overwhelming majority believed they were learning, and there were no major differences between mobile and static users among them. Mobile device users were also more positive in their rating of the resources.

These positive ratings and impressions may be related to expectations from learning materials and motivation for learning. Most participants in this study downloaded for personal interest. This made their motivation for learning very different than for those who were enrolled on a course and therefore likely to be assessed. Those students would expect the materials to provide a certain amount of whatever they considered ‘quantifiable’ learning in terms of results. Listening to the resources needed to be worth their study time. It would also make sense for them to want to engage with materials which were closely linked to their curriculum and at the appropriate level for them. In contrast, the informal learners may have been happier with any resource that provided a more general overview of the subject, or which simply satisfied their curiosity about it. Given the large proportion (nearly a quarter) of participants who downloaded languages materials, it may be that they just wanted exposure to the language they were learning. Those learners were probably more likely to perceive listening to podcasts or iTunes U materials as ‘infotainment’, much like people would listen to a radio programme or documentary because it is of interest. Many radio listeners do not make time to engage with a programme or take notes. They are likely to be

multitasking and engaging with other activities or people, yet many would consider they have benefited / gained an awareness of the topic / learnt from what they listened to. It may therefore be the case that motivation and expectations of the resources may be a stronger determinant of which device is used to engage with the materials they download and other related activities such as taking notes. This will warrant further research, as discussed in the next section.

6 Limitations, Further Research and conclusion

Limitations

A number of limitations affected this study. Firstly, the study would be hard to replicate as changes to the layout of iTunes U after the survey ran limits access to links within the iTunes U collections from mobile devices. Secondly, the participants who took the survey were iTunes U users, and not part of the general public. This means that they were likely to have expectations of iTunes U and the potential of resources available on it. Thirdly, there was no way to confirm whether the reported positive impressions of learning through iTunes U matched actual improvement in knowledge of the subject.

In addition, the research was carried out with users of iTunes U materials from one single institution (even though it is a hugely popular institution on iTunes U) and a distance learning institution in particular (although as Diehl, 2013, points out, mobile learning has historically been a feature of distance education). A wider sample from different institutions might have provided a more varied sample. The fact that most participants were not learners from the institution, or even in the same country, levels off any possible imbalance that this could have created, however.

Most of the research studies cited in section 2, as well as the data collection for this study, were carried out before the relatively-new affordance of downloading directly to mobile devices. This could be interpreted as a limitation. However, the fact that the results from this study show that many learners / users were listening on mobile devices and on the go, shows that even before this affordance was available, users were making use of the mobility that podcasts can provide. Furthermore, the question

in the survey which asked participants where they listened served as a control question to ascertain whether respondents used mobile or static devices regardless of how the materials were loaded to devices. The fact that users can now download directly to their device is surely likely to increase the mobile use of podcast resources.

Further research

Even though some might argue that 10 years after its popularisation podcasting is no longer a new tool for teaching and learning, and therefore might not be worthy of further research, there is still scope for it.

Although there is a large amount of research available on the use of podcasting for teaching and learning, studies on the use of iTunes U have been limited so far, and focused on 'internal' learners. Because of this, the scope of research this study reports on has been mainly exploratory and descriptive. After this quantitative approach, it would be useful to further develop knowledge in this area with qualitative research looking into actual attainment, learner expectations, and the cognitive processes involved in listening to iTunes U resources, particularly among informal learners. As mentioned in section 5, the issue of whether podcasts in general and iTunes U resources in particular are perceived as learning or simply as infotainment may be related to motivation for listening and have an effect on how users utilise and evaluate such resources. The manner in which resources are used, and in particular the effect of continuous partial attention, would be a worthy subject for further research too.

In addition, it would be beneficial to carry out further research into 'internal' users of podcasts. A more up-to-date study may find more similarities with the 'external' participants in this study due to the advances in mobile technologies, smartphone ownership and familiarity with the technology.

Finally, mobile learning research and evaluation methods evolve together with developments in mobile learning (Kukulska-Hulme, 2010). It will be therefore necessary to consider which research methods will be most appropriate to research of this type with mobile learners.

Conclusion

We have argued for the need for further information about users of podcasting and their practices to determine whether podcasting can be considered a mobile technology. By presenting the findings of the first large-scale research study into the use of iTunes U for learning and teaching, this paper has presented differences and similarities among mobile and static device users. The users and practices reported differ from previous literature into podcasting and in particular its use with mobile devices. By approaching this research from the starting point of the platform rather than a particular educational context, access has been gained to a wider range of users whose behaviours and motivations had not been investigated before. It is not the intention of this paper to challenge the validity or applicability of previous research, mostly carried out in the context of VLE-delivered resources for 'internal' learners, but to question its generalizability outside the contexts where it was carried out.

We have argued that formal learners have practices different to those of casual or informal learners, more likely to use the mobile potential of podcasts. It is the case that formal learners are being directed to material that's further than from the definition of podcasting (lack of RSS use, distributed through an aggregator) than the materials that casual learners find. Many previous papers arrived at the conclusion that podcasting was supplementary to other learning. This is not surprising since in many of the research projects it was used as supplementary learning.

Researchers have so far focused either in the use of one podcast (in many cases the one provided by the researcher) or the possibility of using podcasting in isolation as the only learning medium. Whilst it may be the case that some learners might do this, this is no more useful that looking at a single book, CD or mobile app as a single learning solution to learning a subject. Podcasting is in many cases part of a suite of tools that a learner will use as part of their lifelong learning activity - if they look at their learning not as passing a course but as something they're committed to. The suite may or may not include other tools, but if learners download podcasts, they may well use a range of podcasts, from different sources and ranging in teaching style, quality and content. These will in most cases be self-selected and whether consciously or subconsciously be selected because of the users' own learning style, and what they

perceive to be the gaps in their knowledge. This is linked to the development of the users' mobile information literacy, and their ability to find and evaluate resources appropriate to their level of learning and how, when and where to use them making use of static or mobile devices.

With the launch of the iTunes U app, the vast collections of teaching and learning resources available on the iTunes U repository is mobile too, giving users the capability to download directly on many smartphones and tablets. But is mobile learning the same as learning from a mobile device? The concept of mobility used to be centred on the issue of location. Later, it focused more on devices. For example, some mobile apps designed specifically for smartphones do not work on or have equivalent software available for desktop computers. The iPad and tablet computers in general bridge the differences between devices and the lines between desktop and portable blurs even more. As VLEs are adapted for mobile devices this is even more the case, and perhaps the differences in delivery medium that have caused such different practices among podcast users will disappear.

Is using a mobile device for learning the same as mobile learning? Some researchers have pondered whether mobile learning needs to move (e.g. Boy & Motteram, 2013). There is an assumption that 'mobile' means 'out and about'. It could be that users utilise mobile devices as their preferred mode to access content, regardless of their location, as seems to be the trend with television catch up services (Williams, 2013). Mobile devices can provide ubiquitous connectivity, and location may not be a meaningful factor.

Is podcasting mobile learning? Following the definition of mobile learning provided in the introduction as learning that takes place when the learner is not on a fixed location or when the learner makes use of a mobile technology (Kukulska-Hulme, 2005), the answer is that it can be, as podcasting technology (including iTunes U) affords both those conditions. Just like radio can be listened to at home or on the go. Just like television is becoming more mobile with the use of catch up services and streaming directly to mobile devices. The key is that the affordance to provide access to learning anywhere anytime is available and a large proportion of learners use it whilst being mobile, not whether it has to be used in such a way.

Acknowledgements: Thank you to Ben Hawkridge and Peter Scott at the Open University Knowledge Media Institute for their help in placing the link to the survey on all iTunes U at the OU pages and for the provision of download data.

Section II:

Mobile apps for language learning and teaching

Publication 4:

Rosell-Aguilar, F. (2017) State of the App: a taxonomy and framework for evaluating language learning mobile applications. *The CALICO Journal*, 34 (2), 243-258.

Abstract

The widespread growth in availability and use of smartphones and tablets has facilitated an unprecedented avalanche of new software applications with language learning and teaching capabilities. However, little has been published in terms of effective design and evaluation of language learning apps. This paper reviews current research about the potential of apps for language learning and presents a taxonomy of available apps and their use for language learning. The paper also presents a framework consisting of four categories for evaluating language learning apps (technology, pedagogy, user experience, and language learning) and a set of criteria within the categories. Finally, the paper proposes areas for further research.

Keywords: Apps; Language Learning; Taxonomy; Evaluation; Framework

1 Introduction

The market penetration of smartphones and tablets has been very fast and widespread. The impact of these devices is due in part to features that at the time of launch were either new or vast improvements on previous mobile phones, including larger screen size, responsive touch screen, enhanced text-entry, high-quality audio and video playback, recording and editing, voice recognition, enlarged storage, and faster connectivity (Godwin-Jones, 2011). Other features include portability and intuitive interfaces.

Before 2007 most mobile phones only carried the software provided with the device, but this changed with smartphones as they included the ability to add additional software applications. These software applications for mobile devices are commonly known as apps (or mobile apps). Apps can be downloaded from app stores for different operating systems, which offer a category of apps named Education, with apps aimed at wide-ranging learning subjects, including languages. Many Apps can be downloaded for free, whereas others need to be paid for, usually at quite a low cost. Some apps offer a free “lite” version of the app so users can try them and decide whether to buy the full version and other apps offer in-app purchases to access further content or remove advertisements.

2 Apps for language learning: a literature review

2.1 Potential, criticisms, previous studies and taxonomies

The availability of apps has provided affordances for educational activity in terms of what can be done, where and when, with a single device. Among the potential advantages first identified for language teaching and learning were the opportunities to teach, practice or enhance a number of language learning skills as well as learners' knowledge of the areas where the target language is spoken (Rosell-Aguilar, 2009). Other authors have further highlighted the potential of smartphone and tablet devices, as well as apps, for language learning (Burston, 2014; Godwin-Jones, 2011; Kim & Kwon, 2012; Kim, 2013; Lys, 2013; Sweeney & Moore, 2012). This potential is based on the theoretical principles and evidence from the field of Mobile-Assisted Language Learning (MALL). Among these are the provision of resources that can be used autonomously, taking screen size into consideration in the design of resources, and chunking knowledge as independent learning objects to facilitate processing of information (Ally, 2005). Other principles that apply to the use of mobile apps for language teaching are from the field of gamification, the use of game design elements in educational contexts (Domínguez et al. 2013).

App design for language learning has come under criticism: Burston (2014) argued that language learning activities on mobile apps are basic and have mostly replicated what was done before with other technologies. Although most practitioners in Computer-Assisted Language Learning (CALL) would agree that design for online language learning and teaching should be pedagogy-driven (Colpaert, 2006), many language learning apps often provide exercises that test the user without providing teaching first, or provide only a few very brief examples of use. In addition, feedback on performance tends to be limited to a tick or a cross to indicate whether an answer is correct or incorrect. They also tend to lack full instructions and their help sections, if at all available, address technical rather than pedagogical issues. Further criticisms related to the design of language learning apps include too much focus on translation, poor navigation and user-interface design, and little use of the unique properties of smartphones - connectivity with other users in particular (Godwin-Jones, 2011; Burston, 2014).

Other researchers agree: in their review of language learning mobile apps, Kim and Kwon (2012) highlighted that most apps focus on cognitive processes (recognition,

recall and comprehension) and receptive language skills. They note the lack of socio-cognitive activities or opportunities for collaborative learning, more consistent with more modern approaches to CALL and MALL. What a CALL practitioner considers good practice, however, may not be what users want. As classroom practice has moved towards more modern approaches, learners may feel the need for more grammatical reinforcement in the form of drilling, given that many learners equate learning a language with learning grammar. Since individualized feedback on performance is something many learners rarely get outside formal tuition, getting answers correct in quizzes, or using apps to memorize verb forms and vocabulary, are rewarding activities and users are afforded the satisfaction of knowing they got something right. Whilst some apps continue to offer drilling with little teaching and lack of meaningful feedback or support, some examples of good practice are now available, particularly among apps that offer a full language-learning experience (e.g. *Duolingo*, *busuu*).

A number of studies into the use of apps for language learning have been carried out. Yildiz (2012) found that using apps with young learners of English as a second language led to positive effects on vocabulary acquisition, phonological awareness and listening comprehension skills. A study with 33 undergraduate students of Spanish by Castañeda and Cho (2016) showed significant improvements in verb conjugation knowledge after using an app. Their participants also reported enjoyment of the gaming features of the app. Lys (2013) carried out a study of 13 university students of German. She found that the devices were suitable for speaking and listening activities at advanced level, and her students both felt comfortable using the devices and had the necessary competency to use them. Kim (2013) found improvements in listening comprehension among a group of Korean students and also reported positive attitudes towards the use of apps for this purpose, as did Khaddage and Lattemann (2013). Steel (2012) carried out a study of 134 language learners. Students reported that the features they liked best about using apps to support their learning outside class were flexibility, convenience, portability, and the ability to personalise their learning as well as using it on-the-go. The language areas that benefitted students most were vocabulary, reading and writing, grammar and translation activities. Steel found that many students used more than one app and valued the opportunities to engage with language learning outside the classroom. In a study with 85 distance learners of

Spanish, Rosell-Aguilar (2016) also found that learners use apps mostly for vocabulary development, translation, and grammar practice. Students used apps often (44% used them at least once a day), mostly informally rather than in planned study sessions, and for relatively short periods of time. They liked the ability to practise specific areas, rapid access to information, ease of use, and gamification elements, but had concerns about usability and interface design, unreliability of content, lack of grammar explanations, software errors, advertising, and poor feedback among others. All users reported that using apps improved their language skills to different degrees. Further studies have focused on specific skills for certain languages, such as learning non-western scripts (Rosell-Aguilar & Kan, 2015) with very positive results.

Although the use of apps can maximize the opportunities to engage in learning, the experience of learning on mobile devices can be highly fragmented and fraught with distractions (Kenning, 2007). One aspect of this fragmentation is the fact that users access their mobile devices for short amounts of time. This may affect learner choice of which app to use, as, for example, an app that requires listening or speaking may discourage use in a public place. Furthermore, Education apps have to fight for users' attention from strong competition from other apps within the device, such as games, and from pop-up notifications from social media, messaging or email, for example.

Most research into the evaluation of education apps has focused on using one particular app within a concrete educational setting. This is no more useful than looking at a book as a single decontextualized learning solution. Apps are in many cases part of a suite of tools that a learner will use as part of their learning. This use of several apps to complement each other for a purpose is normally referred to as appsmashing.

The classification of the apps that can be used for language learning purposes can be approached from different angles. Previous classifications by Sweeney and Moore (2012), Rosenthal Tolisano (2012), and Schrock (2012) have mainly focused on learning skills, but these classifications did not clearly differentiate between those apps that have been developed for language learning purposes and those that have been developed for other purposes and can be of use to the language learner. A new taxonomy is proposed in section 3.

2.2 Evaluating language learning apps

A number of frameworks for the evaluation of education apps have been proposed (Walker, 2011; Schrock, 2011, 2013; Vincent, 2012; Peachey, 2013). Among the factors for the evaluation of effectiveness, a number of criteria are common to most frameworks. These include technical aspects, design, and whether the app is fit for purpose. The most frequently-mentioned criteria are curriculum connections / relevance and authenticity -whether targeted skills are practiced in an authentic format/problem-based learning environment. Other criteria include good navigation, support, accessibility, security, image and sound quality, usability, price, feedback, interaction, appropriateness of content, and instructions.

Typically, three approaches are used to evaluate software for CALL: checklists, methodological frameworks, and Second Language Acquisition (SLA)-based approaches (Levy & Stockwell, 2006). Jamieson, Chapelle and Preiss (2005) presented six criteria for evaluating CALL software which are in many ways still applicable today. They are: language learning potential, learner fit, meaning focus, authenticity, positive impact, and practicality. To these, others have added more detailed criteria (e.g. Hubbard, 2006). Many of these questions and criteria, however, looked at software (e.g. CD-ROMs) in the way it was provided at the time: as a single solution to be used extensively that had to be carefully selected considering price, platform, and necessary peripherals among other factors. In contrast with previous computer-based software, there is an enormous app market, cost is a fraction of what it used to be (which means apps can be downloaded, tested and deleted without huge investment loss), and the apps will be used on mobile devices rather than language labs or at a fixed location at a predetermined time. Most importantly, although some teachers may recommend the use of certain mobile apps or introduce them into their curriculum, it is mostly the users (autonomous learners in particular) who will make these choices independently.

Two frameworks have been proposed for evaluating language learning apps specifically: Sweeney and Moore (2012) listed the following criteria for evaluation: allowing personalization, visible progress indicators, covering relevant language, covering more than one skill, maximizing exposure to target language, appropriateness for the device (content, activity, interface), and encouraging learning behaviours which correspond with what we know about general mobile-enabled behaviour patterns (including social and gamification aspects). Rodríguez-Arancón,

Arús and Calle (2013) presented a framework for evaluation of language learning apps covering the following criteria: cognitive value and pedagogic competence, content quality, capacity to generate learning, interactivity and adaptability, motivation, format and layout, usability, accessibility, visibility, and compatibility. This later framework is very detailed, presented with long descriptors in a rubric, which can be very helpful to the evaluator but adds complexity to the process. The descriptors of some of the criteria (format and layout, usability and accessibility in particular) overlap in ways that make them difficult to differentiate. Their criteria also miss out very relevant categories such as feedback, included in other frameworks.

Some authors (e.g. Walker, 2011) provide a minimum score they consider necessary for an app to be effective. Others suggest that the more criteria an app meets, the better it is (Vincent, 2012). Such statements are highly contentious. Since apps will serve different purposes for different learners depending on a number of circumstances such as the learner's language level or their personal learning preferences, to establish all the criteria as determining factors for the generic evaluation of an app could be misleading. Whilst some criteria are undoubtedly more crucial than others (e.g. some of the technical criteria – if the app does not work there is no possible learning value), one should not dismiss the potential of an app because it does not meet a certain criterion.

Another issue worth mentioning in relation to evaluating apps is that most frameworks so far have been written by and for teachers and educators. It could be argued, however, that most app use will be outside formal learning opportunities and it is mainly autonomous users who need to evaluate the suitability of apps for their learning needs.

3 A taxonomy of mobile apps for language learning

The importance in education of establishing taxonomies is long established, dating back at least as far as what is known as Bloom's Taxonomy (Bloom, Engelheart, Furst, Hill & Krathwohl, 1956). Taxonomies are important and useful. As Krathwohl (2002) stated, Bloom believed that his taxonomy could serve, among other things, to provide a common language of reference, defining educational goals, and provide a panorama of educational possibilities (Krathwohl, 2002).

With the rise of new educational tools, such as apps, it is crucial that attempts are made to provide a similar taxonomy for the same reasons. Classifying apps into different types should help learners, teachers, and researchers to conceptualise and visualise the different varieties of apps available, which in turn can help to evaluate their potential, as this may depend on the type of app, intended audience and use (for formal tuition or autonomous learning, for example).

In Figure 1 a new classification of apps that can be used for language learning is presented, categorized in three groups according to whether they are primarily designed as language learning tools or not, and with a separate category for dictionaries and translators.

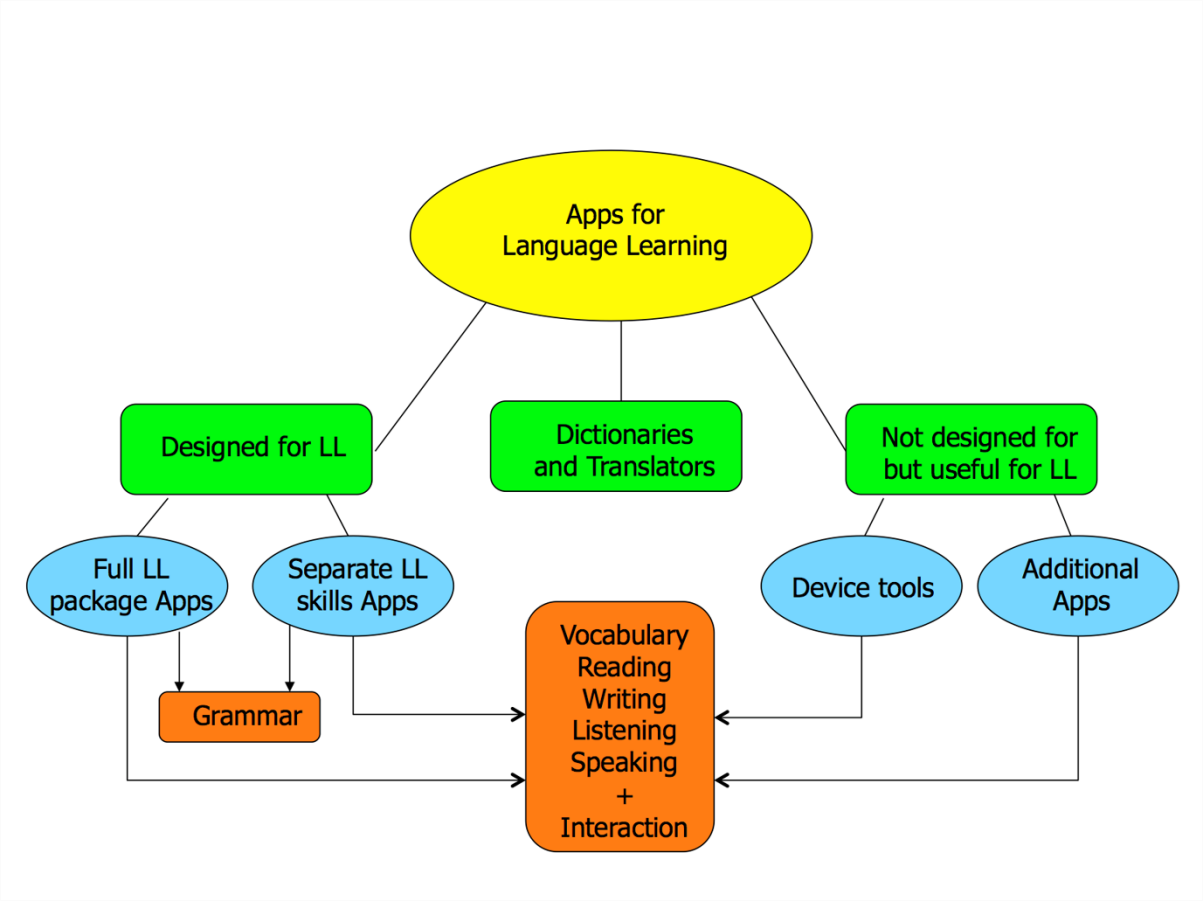

Figure 1: taxonomy of apps for language learning

3.1 Apps designed for language learning: the first group of these are apps that provide whole language learning packages: these apps are designed as full language learning solutions and offer a variety of exercises, grammatical explanations, and interaction with other students and native speakers as well as support from

communities of learners. Some are mobile versions of previously-existing offerings. Most are free to download but many require a subscription to access full content. The most popular are *DuoLingo* and *busuu*. Others include *Rosetta Stone*, *Speakeasy* and *Babbel*. Other apps aim to promote and keep alive lesser-known or endangered languages, such as the *Mixteco* app.

The second main group of apps designed for language learning are those that offer activities to develop different areas of language such as grammar, vocabulary, reading, writing, listening and speaking, as presented in Table 1:

Area of language development	**Description**	**Examples**
Grammar	Grammar drills, some general and some more specific	*French / Spanish grammar and practice* series
		German gender trainer
	Verb conjugations	*Bescherelle, Conjuverb, 501 Spanish Verbs.*
Vocabulary	Vocabulary drilling with images and sounds	*Learn German / French /Italian / Spanish* series
Reading	Literacy (mostly aimed at children)	*Read me stories: learn to read*
	Graded readers	*Lire: French News reading and vocabulary*
Writing	Spelling practice apps	*Learn French Writing*
		Spanish Spelling Tips
	Character writing apps	*Japanese-hiragana, Chinese First Steps*
	Phonics	*Initial Code*
Listening	Texts in several languages with a read-along audio track	*BookBox*
Speaking	Pronunciation	*iPronunciation*

	Phonetics	*MacMillan Sounds*
Interaction	Match language learners with partners or tutors for text, voice and / or video interaction either in real-time or asynchronously	*HelloTalk* *Tandem*

Table 1: taxonomy of apps designed for language learning

3.2 Apps not designed for language learning but useful to language learners. These may be device-native apps provided by default or additional apps that can be installed. The device-native tools that can aid the language learning process include language settings (although not an app per se, these can be changed so that menus and options, as well as apps installed, will be in the target language); web browsers, which offer access to language learning web resources; multilingual text input (dictionary, grammar and auto-correct features can be set to the target language); speech-to-text tools, which can act as tools for testing pronunciation and to check spelling; communication tools such as email / messaging / telephone / video conferencing, which can provide opportunities for synchronous or asynchronous communication among learners, teacher-student, or with native speakers; the photo / video camera, which provide possibilities for creating content which can be the basis of or illustrate communicative exchanges; and even satellite navigators (if the language setting has been changed, directions will be provided in the target language).

Additional apps not native to the device that have uses for language teaching and learning are presented in Table 2:

Area of language development	**Description**	**Examples**
Vocabulary	Flashcard packages: although developed for any subject, learners can create their own sets with vocabulary, translations or conjugations to test their recall.	*Memrise, Quizlet*
Reading	Reading materials in the target language which cater for a variety of interests: e-books, comic books, news and magazine subscription apps.	*Kindle, Comic! Marvel Comics, BBC News, National Geographic*
Writing	Word processors with spell checkers Text sharing:	*Pages*, *Microsoft Word*

	Presentation apps	*PowerPoint*, *Slideshare*
	Multimedia poster	*Phoster*
	Storytelling	*Our Story*
	Journal writing	*Day One*
	Blogging and microblogging	*Blogger*, *Wordpress*, *Twitter*
Listening	Podcast aggregators	*Podcast*, *iTunes U*
	Music streaming services and stores	*Spotify*, *iTunes*, *Soundcloud*
	TV programs and movie streaming and download services	*Netflix, iTunes, Amazon*
	Apps from national radio television broadcasters	*RTVE, France 24, RAI*
	Other video content	*YouTube*, *Vimeo*, *TED*
Speaking	Voice recorders	*QuickVoice*
	Video creation	*Vine*, *iMovie, YouTube*
Interaction	Communication tools in written, audio or video media	*Whatsapp*, *Line*, *Skype*, *FaceTime*
	Social media	*Facebook*, *Twitter*
	Social sharing networks for photographs, bookmarking	*Instagram*, *Flickr*, *Diigo*, *Pinterest*

Table 2: taxonomy of apps not designed for language learning but useful for language learners

In addition, other useful apps for the language learner and teacher include information resources (such as news apps), maps and geography (*Geomaster*) and geolocated information (*Aurasma*, *Wikitude*). Games can also be played in the target language (traditional games such as *Scrabble* or *Hangman*, or more current ones like *Clash of Clans*).

3.3 Dictionaries and translation apps: dictionary apps can be integrated into other apps, such as e-book readers, so that words can be looked up directly within the app. Some dictionary and phrasebook apps also include pronunciation examples.

Translation apps offer machine translations with the option of entering text or speaking, and will pronounce the translation. Some examples are *Google Translate* and *iTranslate*. In this taxonomy they are classified separately as they are designed for both language learners and people who may not speak the language or be interested in learning it at all.

Although opposition to the use of translation apps has been raised by some language teachers, realistically these apps remain the first place where many language learners turn to when composing texts in the target language. The machine translation algorithms have improved vastly in recent years, but translations can be erroneous, especially when words are looked up decontextualized, and learners should be encouraged to evaluate their output for possible errors or editorial needs, as they would with a dictionary.

4 A framework for evaluating language learning apps

Apps can provide a vast array of affordances for language learners and teachers, but aside from highlighting their potential, and given the large number of apps of varying quality available to download, it is essential that learners, teachers and researchers have the tools to evaluate them. The framework for app evaluation proposed here is based on some categories from frameworks presented in section 2 as well as on SLA principles of task design, presented in a simple format for ease of use by both learners and educators.

When designing activities for language learning, cognitive and interactionist SLA principles advocate Task-based Language Teaching based on concepts including noticing, negotiation of meaning, learning by doing, focus on form and collaborative learning (Skehan, 2003; Doughty & Long, 2003). From SLA literature we surmise that language learning tasks should be interactive and include reporting back of the communicative outcome (Skehan 2003), collaborative, interesting, rewarding, and challenging (Meskill, 1999), meaningful and engaging rather than repetitive or stressful (Oxford, 1990), provide opportunities to produce target language (Chapelle, 1998), and make use of authentic materials (Little, 1997). Furthermore, it is known that learners' performance improves if they feel in command of the situation, and if they

are familiar with their environment (Oxford, 1990) so the usability of the design of an app - how easy to learn and use it is - is very important.

The new framework proposed here is divided into four primary categories: technology, user experience, pedagogy and subject specific (in this case language learning), each with a number of criteria. The evaluation framework is presented in Table 3 as a list of questions for use by learners and educators alike to help them decide whether an app meets their learning and teaching needs.

Language learning	**Pedagogy**
▪ **Reading:** does the app provide texts in the target language? ▪ **Listening:** does the app provide audio in the target language? ▪ **Writing:** does the app offer opportunities to write in the target language? ▪ **Speaking:** does the app offer opportunities to speak in the target language? ▪ **Vocabulary:** does the app offer specific activities for vocabulary acquisition? ▪ **Grammar:** does the app offer specific activities for grammar practise? ▪ **Pronunciation and intonation:** does the app offer specific activities for pronunciation and intonation? ▪ **Cultural information:** does the app include information about customs and traditions in the areas where the language is spoken? ▪ **Use of visual content:** are images and videos stereotypical or stock images? Do they represent the	▪ **Description:** does the app store description match what the app does? ▪ **Teaching:** does the app present, explain or model language or does it just test it? ▪ **Progress:** does the app allow the user to track progress or see previous attempts? ▪ **Scaffolding:** do activities in the app progress in difficulty in a way that supports the learner? ▪ **Feedback:** does the app provide feedback? Is it just right/wrong or meaningful explanations? ▪ **Quality of content:** does the content have any errors / omissions? ▪ **Use of media:** does the app make use of sound, images and video in a meaningful way? ▪ **Differentiation:** does the app offer different levels depending on ability? Can these be accessed directly? ▪ **Engagement:** does the app keep the user interested or are activities repetitive?

diversity of the areas where the language is spoken? ▪ **Language varieties:** does the app include different regional or national varieties of the language?	
User experience	**Technology**
▪ **Interaction:** does the app allow users to interact with each other? ▪ **Interactivity:** is engagement with the app content active or passive? ▪ **Sharing:** does the app allow or encourage sharing content? ▪ **Badging:** does the app provide recognition that can be shared on social media? ▪ **Price:** does the user need to pay to download the app? Is there a "lite" version? Does it offer in-app purchases? ▪ **Registration:** does the app require the user to register? ▪ **Advertising:** does the app include pop-up ads? Are these distracting?	▪ **Interface:** is the interface clear and uncluttered? ▪ **Navigation:** is the app intuitive to navigate, with clear menus and options? ▪ **Instructions:** does the app offer instructions on how to use it? ▪ **Stability:** does the app freeze or crash? ▪ **Gamification:** does the app have game-like features to increase engagement? ▪ **Support:** does the app have a help section? ▪ **Offline work:** does the app require an internet connection to work?

Table 3: Framework for Language Learning app evaluation

There is a degree of overlap between the criteria, and some of them apply to more than one of the four main categories. For example, Feedback could apply to technology (in terms of how it is presented), pedagogy (how it relates to teaching), language learning (the quality of the feedback) and user experience (how well the feedback fits in the learning process, where it appears, how it can be accessed). In Figure 2 the framework is presented in visual form, although this is somewhat subjective and limited by visual representation.

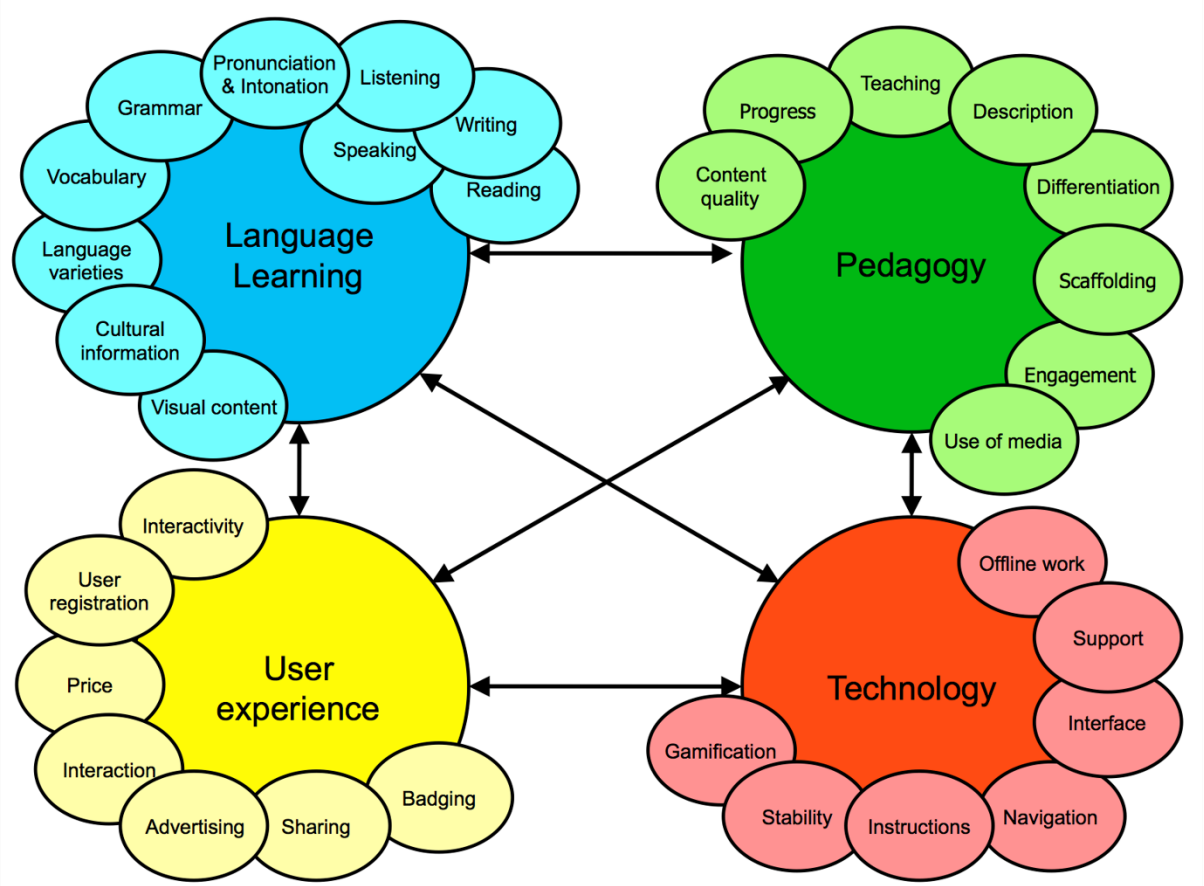

Figure 2: categories and criteria for the evaluation of mobile learning apps

This list of questions does not offer a rubric with detailed descriptions of each criterion for two reasons: to keep the questions clear and uncluttered, and because the aim of the questions is not to award a mark or value to each question, but for the questions to act as a reflection tool for both learners and teachers, as well as app developers and researchers. There is no indication in the framework about how many of the criteria an app needs to meet to be considered apt for language teaching or learning because different learners may find an app useful or not depending among other reasons on their purpose, learning preferences, location and personal circumstances. In addition, some criteria will only apply to an app depending on what it is supposed to do. There would be no gain, for example, in appraising a vocabulary app negatively for not offering speaking practice, although a more comprehensive evaluation, with positive appraisals for a higher number of the criteria, would be expected for apps that claim to offer a full language learning experience.

It is important to stress that this evaluation framework applies to commercially available self-contained apps that can be installed on devices such as smartphones

and tablets, and not to all resources that can be accessed through such devices, such as ebooks or web resources.

An early version of this framework was tested in a workshop in Ireland with a group of 18 language teachers in October 2014. After a presentation of the framework, participants were asked to evaluate the apps they use for language teaching using the criteria in the framework. Participants provided oral feedback in a short focus group activity at the end of the workshop. All participants were positive about the use of the criteria and supported that the criteria helped them shape their own evaluation of language learning apps. It was mentioned that, since most students own smartphones and / or tablets, it would be a worthwhile activity to spend time in class presenting the framework to language learners to enable them to make better-informed decisions about which apps are suitable for them depending on the curriculum as well as their own learning preferences and needs. Suggestions for changes to the framework included revising the descriptions for clarity, and separating some of the categories. The original framework only had two main categories (Pedagogy and Technology) and, upon further reflection after the workshop, the four-category model was created.

In addition, a second workshop with a different group of 26 language teachers took place in Cyprus in November 2015. Following a similar format, the feedback this time focused on the Language Learning category, which some the teachers felt was too abstract. Based on this feedback, that section was rewritten to change criteria that referred to SLA and MALL theories for the current criteria presented, thus making it clearer to use and dispensing with the need for users to be aware of current SLA trends when utilising the framework.

5 Further research

Although the experience of mobile device use in the classroom has been well documented, the amount of research examining how learners engage in mobile learning outside the classroom is much smaller (Stockwell, 2013). There is much potential for research in the field of mobile apps for language learning, including the following:

- App design and quality: Can apps offer true language learning solutions? What do language learning apps offer to the learner that other more traditional methods do not (and vice versa)?
- Users: As part of research into the use of apps, questions that should be asked include: Who uses language learning mobile apps? Why? Where? How? What do they think about learning with apps?
- Appsmashing: how apps are used in combination with other resources remains an interesting topic still under-researched.
- Normalization: at what point do we consider the use of smartphones and tablets normalized (Bax, 2003) to the point that they are fully integrated into learning activity? Can we assume learners own such devices and have the competencies to know how to use them, select appropriate resources, and utilize them when and where they are best served by them?
- Attainment: although the potential for learning is there, further research is needed on learning outcomes.

Some of this research, in particular research into actual gains in language proficiency, will be difficult to carry out as learners tend to use apps in combination with other apps or to supplement other forms of learning, formal or informal, which makes causality difficult to prove.

6 Conclusion

This paper has provided an evaluation framework for language learning mobile apps, but has not evaluated the apps themselves. A proposal to make this framework available on a dedicated website for language apps evaluation is currently being considered.

Developments in mobile app software are fast and it is difficult to foresee what direction software and hardware will take next. Wearable technologies will undoubtedly provide new affordances for learning, but whether they succeed in penetrating the mainstream (or not, as the Google Glass initiative has proven so far) and their effect on mobile learning will be an interesting development to ‘watch’.

In memoriam: I would like to dedicate this paper to Lesley Shield, a true CALL pioneer and wonderful colleague, from whom I learnt a lot about the evaluation of CALL resources among other things.

Publication 5:

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Abstract

Studies into the use of mobile applications (apps) for language learning have mostly focused on small samples of learners using a specific app rather than using the apps they have selected for themselves. More data is required to understand the ways learners engage with apps for language learning (through profiles of app users, how apps are used, and user opinions of learning with apps) to create a realistic picture of users in their natural settings. This chapter reviews current research, highlights the potential of mobile apps for language learning, and presents the results of a study into how a group of language learners use mobile apps of their choice. The study is innovative, as it provides the first comparison between app users and app non-users. Data was collected through a questionnaire (n= 85) and interviews (n=7). The results suggest that there are differences in age and gender between learners who use mobile apps and those who do not. The results also indicate that learners use apps mostly for vocabulary development, translation, and grammar practice. Apps are used often, mostly informally, and for relatively short periods of time. Learners like the ability to practise specific areas, rapid access to information, ease of use, and gamification elements, but have concerns about reliability and other factors. All users reported that using apps improved their language skills to different degrees. The chapter discusses the implications of these findings for learner training and app development, reports on limitations, and highlights directions for further research into apps for language learning.

1 Introduction: apps for language learning

It has been less than ten years since smartphones were introduced for mass consumption, and in that time they have become almost ubiquitous in many parts of the world. Worldwide, 2.7 billion connections had been made from smartphones by January 2015, and of all webpage views between January 2014 and January 2015, 38% were made from smartphones or tablets (Kemp, 2015), In the USA, for example, 64% of adults own a smartphone, up from 35% in 2011 (Smith, 2015). Among the features that contribute to the appeal of smartphones, as well as tablets, is the ability to install software chosen by the user rather than the manufacturer. This software is specifically designed for mobile operating systems (OS) found in smartphones and

tablets and commonly known as apps or mobile apps, available to download from app stores. The most popular ones are the Apple App Store for devices that run the Apple iOS operating system (such as iPhones and iPads), and Google Play and the Amazon App Store for devices that run the Android operating system. A large number of apps are available to download. As of July 2015, Google Play and the Apple App Store offer more than 1.5 million apps each (Statista.com, 2015), although many of these are the same app designed for the different operating systems. The number of downloads for these apps is very high too: the Apple App Store reached 100 billion downloads in June 2015 (Fiegerman, 2015).

Many apps are available for educational purposes, providing new opportunities to engage in learning activities in different spaces, places, and at the users' own pace. They make use of the features that smartphones and tablets possess, including larger screen size, responsive touch screen, enhanced text-entry, high-quality audio and video playback, recording and editing, voice recognition, enlarged storage, faster connectivity (Godwin-Jones, 2011), portability, sleek design, and intuitive interfaces. One effect of the widespread use of smartphones and tablet devices has been the fall in popularity and ownership of single-use devices, such as mobile phones which only allow calls and texts, traditional wristwatches, or point-and-shoot cameras; even the iPod Classic was discontinued in September 2014 (Johnston, 2014). The reason for this is that many of the capabilities of such devices are now integrated into smartphones, providing these functionalities within a single device.

As early as 2009, there were claims about how apps could serve language learning activity with tools such as translators, dictionaries and voice recorders that could be used to practice pronunciation, as well as the potential to increase students' awareness of the areas where the target language is spoken (Rosell-Aguilar, 2009). Apps were soon evaluated as potentially beneficial for language learning by a number of authors (Burston, 2014; Godwin-Jones, 2011; Kim & Kwon, 2012; Lafford, 2011; Sweeney & Moore, 2012). These appraisals were based on principles from Second Language Acquisition Theory (SLA) and Computer-Assisted Language Learning (CALL), such as noticing, negotiation of meaning, learning by doing, focus on form and collaborative learning (Skehan, 2003; Doughty & Long, 2003), the provision of tasks that are meaningful and engaging (Oxford, 1990),collaborative, interesting, rewarding, and challenging (Meskill, 1999), interactive (Skehan 2003), make use of

authentic materials (Little, 1997), and provide opportunities to produce target language (Chapelle, 1998). Other fields that can serve as a framework for the evaluation of apps include the field of Mobile-Assisted Language Learning (MALL), which advocates the provision of resources that can be used autonomously, taking screen size into consideration in the design of resources, and chunking knowledge as independent learning objects to facilitate processing of information (Ally, 2005). The use of apps for language learning is an example of both didactic mobile learning, defined as "learning from mobile educational material … in a way that responds to the potential and the limitations of mobile devices" (Kukulska-Hulme & Traxler, 2005, p. 26), and discursive mobile learning, based on the interaction among learners that apps can afford. Another advantage of MALL is that it offers 'just in time learning' (Traxler, 2007, Pegrum, 2014) "where learners can often take advantage of unexpected free time since they often have their devices with them" (Evans, 2008, p. 492).

An issue that affects learner engagement with apps for learning purposes is Continuous Partial Attention, the process of paying simultaneous attention to a number of sources of incoming information, but at a superficial level (Stone, 2009). The practice of taking the opportunity to learn during short periods of inactivity also has implications for the design of mobile apps, as learners may choose not to engage with materials that require deep concentration or a long time to process. Kenning (2007) speculated that mobile learning could be "a highly fragmented experience liable to be fraught with distractions" (p. 194). Both this and continuous partial attention affect the mobile learning experience, as users can be distracted by notifications from other apps such as Facebook, Twitter, email, or messaging whilst using their mobile devices.

One common assumption regarding the use of technology, including mobile technology, by 21st Century learners is that they are 'digital natives' already prepared for the use of devices (Prensky, 2001). This notion, however, has been questioned by many (e.g. Bennett, Maton & Kervin, 2008). Instead, Pegrum (2014) refers to learners being 'tech-comfy', able to use new technologies for social and entertainment purposes, but in need of training to become 'tech-savvy' and use the technologies for professional and academic purposes as well as developing critical skills to evaluate them (Pegrum, 2014, p.39).

Finally, other factors to take into consideration in the evaluation of apps for language learning are usability of the app (Shield & Kukulska-Hulme, 2006) and gamification, using game design elements applied to educational contexts (Domínguez et al. 2013).

2 Literature review: research into apps for language learning

The use of apps for language learning has been the subject of a number of studies. Most of these have found very positive attitudes towards learning with apps (e.g. Khaddage & Lattemann, 2013; Brown, Castellano, Hughes & Worth, 2012).A study with 13 university students of German using iPads to engage in listening and speaking activities at advanced level by Lys (2013) concluded that the devices were suitable for engaging with such activities; her students felt that they had the necessary competency to use the devices and were also comfortable using them. Castañeda and Cho (2013) carried out a study with undergraduate students of Spanish who showed significant improvements in verb conjugation ability after using a conjugation app. The participants in their study also reported that the gaming features of the app were the most enjoyable. Kim (2013) also found positive attitudes towards the use of apps. Her study of Korean students learning English reported improvements in listening comprehension. Yildiz (2012) reported that using apps with young learners of English as a second language led to positive effects on vocabulary acquisition, phonological awareness and listening comprehension skills. Similarly, other studies have found improvements in literacy, reading and writing with native speakers of English (McClanahan, Williams, Kennedy, & Tate, 2012; Harmon, 2012). In his study of 70 Hungarian learners of German, Kétyi (2013) reported that most students enjoyed using the chosen app (*busuu*) and considered it helpful for language learning. The students liked the gamified elements, the use of different media, interaction with other learners, and immediate feedback. *Busuu*, however, requires a paid subscription for full access to the content, and 92% of participants stated that they would not be willing to pay after the free seven-day trial they took part in. Other studies have reported on skills specific to certain languages, such as learning Chinese characters (Rosell-Aguilar & Kan, 2015), with very positive results.

As well as positive results and impressions, there have also been criticisms about language learning apps, particularly in terms of design. Many language learning apps

are designed for learners at beginner level. Activity types for vocabulary recall and grammar drilling are relatively easy to design; since beginners need to build their vocabulary and value exercises that drill grammar items such as conjugation, plural formation, or prepositions, apps are a good fit to practice in such a way. This sort of drilling also lends itself to activity types where only one answer is correct, and therefore such activities are easy to assess as right or wrong, with feedback on performance often limited to a tick or a cross. Advanced language learners, in contrast, require more sophisticated activities which are consequently harder for automated software to assess and provide feedback on. Brown et al. (2012) warned that the success of any activity involving mobile devices depends on the task carried out as well as familiarity with the device and software. Kim and Kwon (2012) reviewed a number of language learning mobile apps and concluded that most apps focus on cognitive processes (recognition, recall and comprehension) and receptive language skills rather than socio-cognitive activities, with little collaborative learning. Burston argued that "pedagogically, nothing new has been done with smartphones that has not already been done with earlier mobile devices" (Burston, 2014, p. 108). Other criticisms surrounding the design of language learning apps include poor navigation and user-interface design, the fact that there is too much focus on translation, and little use of the unique properties of smartphones, such as multimedia capabilities and connectivity with other users in particular (Godwin-Jones, 2011; Burston, 2014).

This situation is changing and, as Sweeney and Moore have noted, "more useful material is gradually being created by publishers" (2012, p. 35). Whilst some app developers continue to offer limited activities that focus on drilling and translation without much meaningful feedback or support, some apps such as *Duolingo*, *busuu* or *Babbel* offer a much more well-rounded experience: including practising a number of language skills (reading, speaking writing, listening), a wider variety of activities, and use of gamification to keep the user engaged.

3 Research questions

Studies into the use of apps for language learning have mostly focused on small groups using a specific app rather than learners using the apps they have selected for themselves. However, learners typically find their own apps through searches,

recommendations, or download popularity charts in app stores, and most app use for language learning is rarely integrated into formal teaching. As such, a research approach that allows the investigation of app use in naturalistic settings is necessary. More information is required to understand the way learners engage with apps for language learning, including providing a profile of the app user, how apps are used, and user opinions of learning with apps. In addition, although smartphones and tablets are mobile devices, there is little evidence that they are being used 'on the move.' The research questions this study focused on were:

- Are there any differences between app users and app non-users? This includes factors such as age and gender, devices owned, and operating system of those devices.
- What type of apps do language learners choose and use independently to aid their learning?
- How do learners use apps? How often, for how long, where, and when?
- What are the most and least appreciated features of language learning apps? This question includes features that learners would like to see in apps and the issue of payment for apps.
- Do learners think the use of apps contributes to their language learning?

4 Participants and Methods

Participants in this study were adult learners of Spanish taking a Higher Education qualification with a distance learning university in the UK. The research received approval from the university's Human Research Ethics Committee. At the time of the study, the participants were attending a week-long residential school in Spain. A questionnaire was distributed among all 165 participants (60.61% female / 39.39% male) in the residential school, who were advised that filling it in and returning it was voluntary. A total of 85 students (51.51%) returned the questionnaire.

A first version of the questionnaire was designed and a pilot study was carried out with a sample set of 91 students in 2014. Based on the responses from that pilot, the

questionnaire was revised. The more concise and clearer questionnaire contained 27 questions: twenty multiple-choice questions and seven open questions. Questions included personal data (age, sex), device ownership (which device, Operating System), and use of apps for language learning (which, where, when, how long, what for, opinion, features, impressions) (see Appendix 1 for full questionnaire). The data from the paper questionnaires was input into SurveyMonkey for statistical analysis.

In addition, seven voluntary interviews were carried out with five female and two male respondents. These interviews were 15 minutes long on average and were audio recorded with the students' consent. The interview questions asked about device preference, use of apps context, feedback obtained from using apps, app features and paying for apps. Some of these questions were followed up with impromptu questions to seek clarification, depending on previous answers. The interview recordings were transcribed and coded for thematic analysis following principles of participant anonymity and research rigour.

Questionnaire respondents provided information about device ownership. Those respondents who did not reply and those who did not own a smartphone or tablet (n=8) were removed from the analysis, making the total n= 77. Of these, forty-eight (62.34%) were female and twenty-nine (37.66%) were male. Seventy-one respondents provided their age. The age spread was twenty-five (35.21%) in the 18-30 range, seventeen (23.94%) between 31 and 40, fourteen (19.72%) between 41-50, nine (12.68%) between 51-60, five (7.04%) between 61-70 and one (1.41%) over 70.

5 Results

The results are presented here, divided into five sub-sections in response to the five main research questions.

5.1 User profiles: are there any differences between app users and app non-users?

Fifty-eight (78.38%) respondents use language learning apps to support their language learning, compared to sixteen (21.62%) who do not. This is a considerable

decrease from the pilot study, where 34.06 of respondents did not use apps. Among the app users, thirty-seven (63.79%) were male and twenty-one (36.21%) female, whereas among app non-users, the gender split was50% (eight each). Of the sixty-eight participants who provide their age, fifty-three (77.94%) were app users and fifteen (22.06%) were app non-users. The breakdown of age ranges is presented in Table 1.

Age	App users	App non-users
18-30	19 (35.85%)	4 (26.67%)
31-40	16 (30.19%)	1 (6.67%)
41-50	8 (15.09%)	5 (33.33%)
51-60	6 (11.32%)	3 (20.00%)
61-70	4 (7.55%)	1 (6.67%)
70+	0 (0.00%)	1 (6.67%)

Table 1: Age ranges of app users and app non-users.

A total of fifty-eight (100%) app users and thirteen (81.25%) app non-users provided details about which devices they own (Table 2).

Device owned	App users	App non-users
Smartphone	19 (32.76%)	5 (38.46%)
Tablet	4 (6.90%)	2 (15.38%)
Both	35 (60.34%)	6 (46.15%)

Table 2: Device ownership among app and app non-users.

Participants' devices had a variety of Operating Systems, but iOS (Apple's OS) devices almost doubled those who used Android OS. Only a minority use devices that run the Windows mobile OS.

The respondents who did not use language learning apps listed the following among their reasons for not using them: lack of awareness of apps for language learning (37.50%); preference for other methods (such as videos, podcasts, using a laptop rather than a mobile device), or more 'traditional' methods, such as books or spoken exchanges with other people (25.00%); lack of time (12.50%); and screen size (6.25%).The main reason for not utilising apps in language learning given by three

respondents (18.75%) was that the app store for Windows Phones lacked adequate content for language learners.

5.2 What type of apps do language learners choose to use independently to aid their learning?

The primary area of language learning for which respondents use apps is vocabulary (82.26%), followed by translation (66.13%), and grammar practice (58.06%). Some 41.94% use them for reading and 38.71% for listening practice. Apps are used least for speaking practice and to facilitate interaction with others (11.29% each). The top five apps used by questionnaire respondents are *Duolingo* (a full language learning app), mentioned by seventeen respondents (29.3%), *Memrise* (flashcard app) by sixteen respondents (27.6%), *Google Translate* (translation app) by twelve respondents (20.7%) and both W*ordReference* and *Collins Spanish Dictionary* (dictionary apps) by four respondents (6.9%) each. Other apps mentioned included *busuu* and *Babbel* (full language learning apps - three respondents each); different dictionary apps, and various news, TV and radio apps, which allow language learners access to native sources of Spanish reading and listening practice, were also used.

The use of apps is not restricted to a single app: three quarters of respondents use more than one app to supplement their language learning.

5.3 How do learners use apps?

The majority of mobile device users of language apps in this study state that they use apps informally, as and when the opportunity arises (60%), rather than in planned study sessions, although 40% state that they use apps both informally and during planned study sessions. Male and females do not differ significantly in their response to this question, but there is noticeable variation between respondents of different age ranges, with younger age ranges tending to use apps only in informal situations, while older age ranges are more likely to use apps both informally and in planned study sessions. One of the interviewees (interviewee 4) stated that he tends to plan the use of apps and can devote between 30 minutes to an hour on *Memrise* “if the session is going quite well.”

Some sixty-one participants responded to a question about the frequency of their app use: ten respondents (16.39%) use them several times a day, seventeen (27.87%)

use them every day, twenty-two (36.07%) several times a week, five (8.20%) about once a week and seven (11.48%) less frequently than once a week. There is no particular trend between different ages, but there is distinct variation between male and female respondents in this question, with 52.38% of male respondents using apps at least daily, compared to 36.11% of women. Although female respondents use apps less frequently, they are more likely to use them for a longer period of time: 52.63% of female respondents report they use an app for 15 minutes or longer, in contrast with male respondents among whom only 23.81% use the app for that long. Some 76.19% of male and 47.36% of female respondents use apps for shorter periods of time, ten minutes of fewer (see Figure 1).

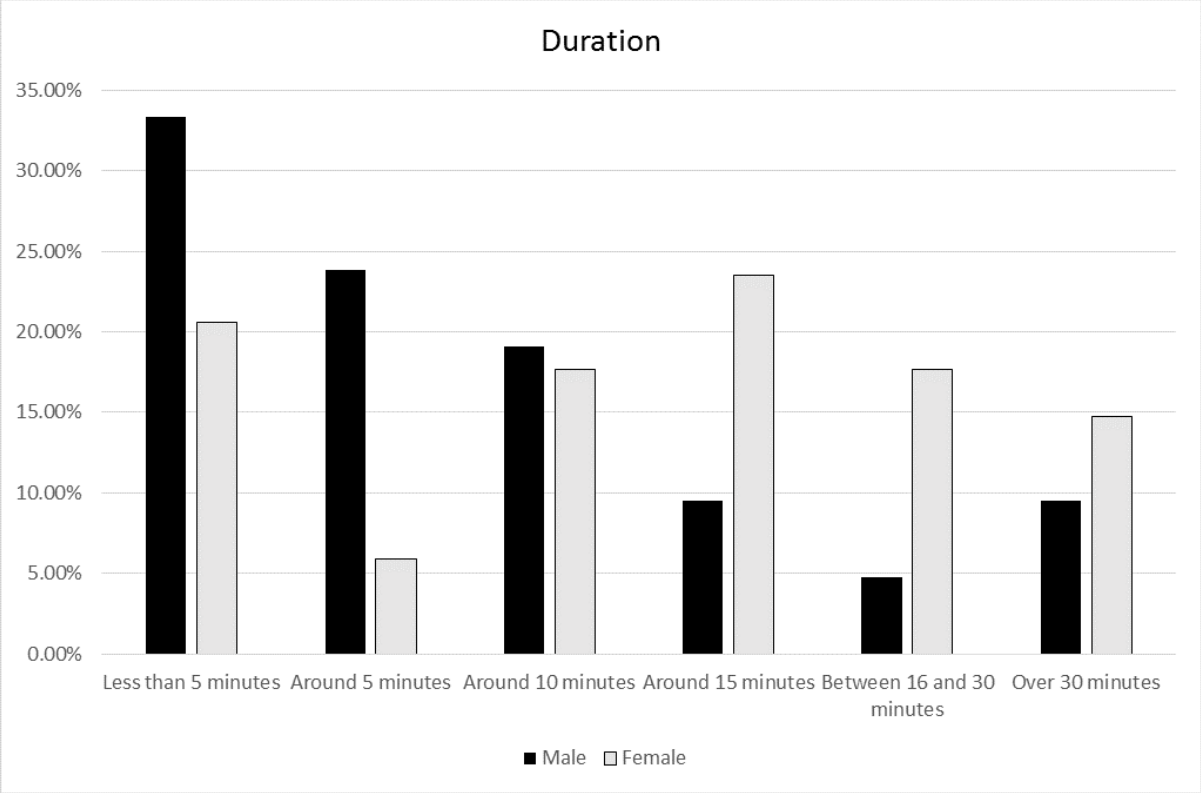

Figure 1: percentage of time spent using apps by gender.

This trend is echoed in the interviews with female app users. Interviewee 6 reported that she could spend up to 30 minutes on just one entry of the *Collins Dictionary* app, as it afforded her the opportunity to expand and explore lots of different phrases from just one word. Interviewee 2 also reported that she often used apps for up to 30-45 minutes, although she would use game apps or *Memrise* to "kill time" when waiting for the bus. Interviewee 3 reported using *Memrise* for up to 30 minutes at a time, although she would also use apps "whenever I have five minutes," e.g. on the way to work.

Interviewee 7 also used *Duolingo* or similar apps for between 30 minutes to an hour, as she found it “quite fun” and “tends to get quite caught up in it.”

To obtain information about where respondents use language learning apps, the questionnaire offered a number of choices and asked participants to select all that applied. Responses can be seen in Figure 2.

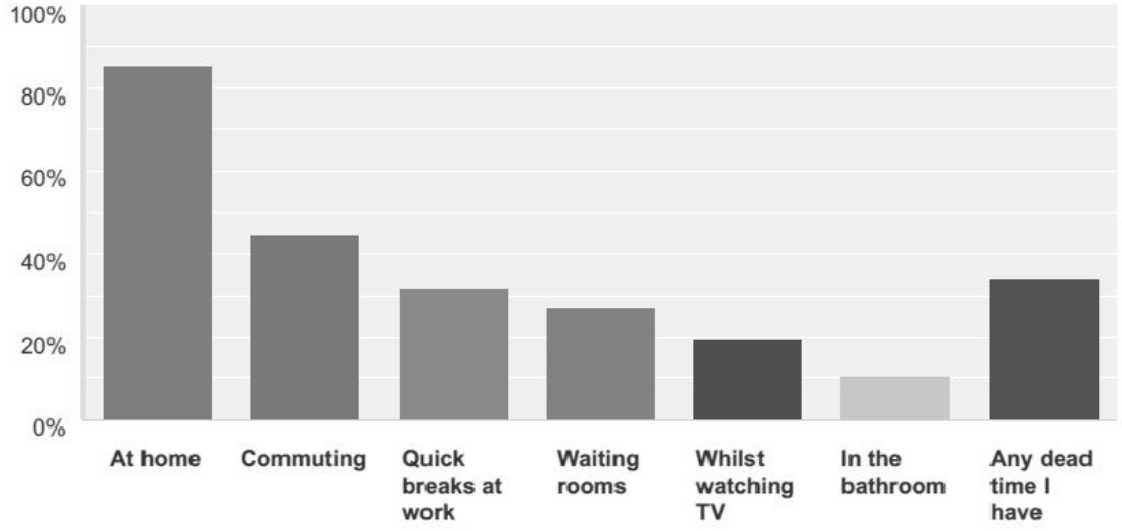

Figure 2: situations where language apps are used

During the interview questions related to the location, interviewee 6 states that she could use apps any time in a 24-hour period, particularly as she does not sleep well, but she also used apps during breaks at work. Interviewee 1 used apps to listen to audiobooks via *Audible* on long train journeys and on her way to Spanish tutorials to get her in the right frame of mind. Interviewee 4 commented that he needed to concentrate on the apps, rather than use them while doing other things, such as watching TV.

One of the interview questions asked those who own more than one device (smartphone and tablet) about preferences for which device to use for language apps. For Interviewee 7, the choice between a tablet and a smartphone depended on where she was in the house, and the purpose for which she was using the device. She stated that her iPad was used for planned study sessions, when she was using apps such as *Duolingo*, which are more visual, or when she was having her lunch. In contrast, she used her iPhone for when she just wanted to quickly check something on *WordReference* whilst studying, or to look up verb forms whilst speaking in Spanish.

Interviewee 6 also stated that location is a deciding factor in her choice of whether to use a tablet or a smartphone at any given time, and noted the convenience of an iPhone over a tablet, although she found the *Collins Dictionary* app easier to use on an iPad due to screen size. Interviewee 2 also noted the convenience of smartphones when “on the go” due to device size, compared to a “big tablet.” She did not find that screen size affected her decision between a tablet and a smartphone. For interviewee 5, the choice between iPhone and iPad was decided by the type of app he wanted to use at the time. Like the others, he saw dictionary apps on the iPhone as convenient, as he could “take it around with [him] everywhere and when [he thought] of something, [he could] just look at it”, but saw the iPad as more suited to visual apps and games such as *MindSnacks,* as it was “just easier to look at” and also easier for using books due to its bigger screen.

5.4 What are the most and least appreciated features of language learning apps?

Three questions in the questionnaire asked respondents about the app features they liked best, least and further features they would like to find in language learning apps. This issue was also part of the interview questions.

A total of forty-eight respondents replied to the open question about most liked features. The most mentioned feature was the ability to focus on specific areas, such as translation, grammar practice, or vocabulary (mentioned by twenty-two respondents). Other liked features included ease of use (mentioned by 12 respondents), rapid access to information (8 respondents), game-like elements (4 respondents), access to authentic materials (2 respondents), and portability and feedback (1 respondent each).

The interviewees also mentioned these features. In terms of app design, Interviewee 2 mentioned that she liked apps that were “colourful, easy, straight to the point”, and were “simple and visual,” while for interviewee 3 the app she used the most (*Memrise*) was simple and had “just what you need”. With regards to the ability to focus on specific areas, one respondent mentioned the ability to practice “over and over.” Interviewee 1 mentioned how she appreciated the ability to focus on troublesome areas in *Memrise*, and how the app would repeat words that the user was not getting right. Likewise, Interviewee 4 stated that a helpful feature of *Memrise* is that the user was not allowed to make too much progress until they had mastered a certain number

of words. In terms of gamification, several respondents mentioned that apps were 'fun' and the competitive nature of some apps, which gave them targets to reach every day, were encouraging. Interviewee 5 stated that 'fun' is an important feature for him and that certain games can be "quite addictive," although the app needed to be effective as a language learning tool as well. Interviewee 7 mentioned that she gets competitive with herself and loved "that buzz of being able to recall" vocabulary. Interviewee 4 drew attention to the "clever little system," whereby one's progress on the app he used is measured by the growth of virtual plants. Interviewees 3 and 5 mentioned that apps on mobile devices offered more opportunities for study and negated the need to carry around heavy language books when one wants to 'learn on the go.' This was particularly beneficial for users such as interviewee 6, who had to stay in hospital for long periods and needed to know she had everything available to continue her studies. She also mentioned that iPads are much easier tools on which to study than a laptop, which is much heavier and awkward for somebody who may have to study in bed. The convenience of being able to undertake short bursts of activity was also mentioned: Interviewee 1 stated she was able to "do two minutes and then put it down" while waiting for something to boil, and Interviewee 6 mentioned that she liked being able to do "a selection of different tasks" during breaks at work.

There was also a variety of responses to the question of what features were liked least in language apps. 40 questionnaire respondents answered this question and the most common response (8 responses) highlighted usability issues about the interface and design of the app: cluttered interface, text size and colours that have poor contrast, too many clicks, and amount and difficulty of typing on a smartphone. Other responses included unreliability of content/content errors (7), lack of grammatical explanations and usage examples (4), software glitches / freezing (4), advertising (2), the decontextualized manner in which content is presented in some apps (2), having to pay for content (2), requirement to be online to use certain apps (2), and poor feedback (1).

The interviewees mentioned some of these issues as well. With regards to content unreliability, Interviewee 4, a user of both *Google Translate* and *Translator*, suggested that many translation apps provided different answers and unreliable translations; at the same time, nuances could be lost. He tended to use these types of apps as "a bit

of a crutch" and "confirmation," which he could "access at any given moment" but noted that it was important not to "over-rely" on them and be "selective" in what he uses. Interviewees 1 and 5 stated their dislike of advertisements in mobile applications, particularly when the ads were so intrusive that they prevented the user from actually utilising the app until the advertisements were closed. However, Interviewee 1 was not bothered by them when they did not impede the use of the app. Although adverts did bother Interviewee 5, he did not consider this enough to justify paying for an app solely to disable them. Interviewee 6 also found them "distracting and annoying" and she named advertisements among her least favourite features of apps; she is willing to pay to eliminate adverts.

Other issues that did not appear in the questionnaire responses but were mentioned during the interviews are:

- Lack of content for advanced users Interviewee 5 suggested that apps tend to be tailored more for those at beginner level or who want to learn holiday phrases. Interviewee 1 made a related point, that drop-down or multiple-choice questions offered by some apps were too easy: she believed they would be more challenging if users had to come up with the answer themselves.

- Inability to customise according to level or need: Interviewee 1 stated that although she had used *busuu* in the past, she no longer used it, as one has to complete beginner-level sections before moving onto more advanced areas, which is too time-consuming. Interviewee 3 also mentioned certain missing features in *Memrise*, such as the ability to test oneself on gender of nouns, rather than just the noun itself.

- Lack of synchronicity between apps: although not mentioned by any respondents in the questionnaires, an interesting point raised by interviewee 6 is the lack of synchronicity between language learning applications, of the type which exists between diet tracking and fitness apps, for example. She described language learning apps as "disjointed" and would like to be able to highlight a new word in a dictionary app, and then incorporate any new words into a flashcard app to aid vocabulary learning.

- Predominance of Latin American Spanish: this was not mentioned by any of the questionnaire respondents, but two interviewees mention that they dislike the predominance of Latin American Spanish varieties in the apps available, as they would prefer to focus on Peninsular Spanish. Interviewee 5 mentioned only using *DuoLingo* for German, not Spanish, due to its focus on Latin American Spanish.

Questionnaire respondents and interviewees were also asked about features they would like to see in apps. Answers to this question were, in many cases, extensions to the question of what was disliked most about apps. This might be due to the location of the question in the questionnaire, a design fault that should be rectified in further replications of the study. Responses include mainly design and pedagogical issues. In terms of design, participants mention better structure and mapping of content, better quality sound and spoken translation capabilities, the ability to access content offline, and the ability to speak to somebody "in real time" and facilitate exchange with native speakers. From a pedagogical point of view, participants include having one app that allows them to practise all four skills of reading, speaking, listening and writing, more grammatical content, more tests, quizzes and interactive material, more usage examples of both grammar and vocabulary, more colloquial and idiomatic examples, and better quality feedback.

Survey respondents were asked specifically about the type of feedback they receive from apps, to which 42.11% replied that feedback is either "very good" or "good." For 22.81%, feedback is either "OK" or "not very good." Although no respondent stated that feedback is "terrible," 35.09% of respondents claimed that they do not receive feedback from the apps they use - possibly due to the types of apps that some respondents use. Interviewee 5 provided an example of useful feedback that he used to receive from using *LiveMocha* - native speakers of the language would correct him by listening to audio recordings he made in Spanish and pointing out mistakes in pronunciation. Interviewee 7 added that apps such as *WordReference* offer a way to check herself on areas such as verb conjugations.

A final issue included in this section is that of app prices and payment for upgrades, full content and/or removing advertising. The questionnaire asked whether respondents pay for language learning apps and why, giving a list of the six most common reasons from the pilot study. In response to the question about whether they pay for apps, 60.34% of questionnaire respondents selected that they never pay for apps and only download free apps. A further 29.31% pay "sometimes," 3.45% pay "most of the time," and 6.90% pay only after trying a 'lite' version (if available). There was no discernible relationship between age range and willingness to pay for apps. However, responses suggested that male app users were more likely to pay for apps than females. No female respondent stated that she paid for language apps "most of the time," and 25.00% stated that they paid for apps "sometimes." Male respondents were more likely to pay for apps "most of the time" (9.52%) or "sometimes" (38.10%). The full breakdown of responses appears in Figure 3.

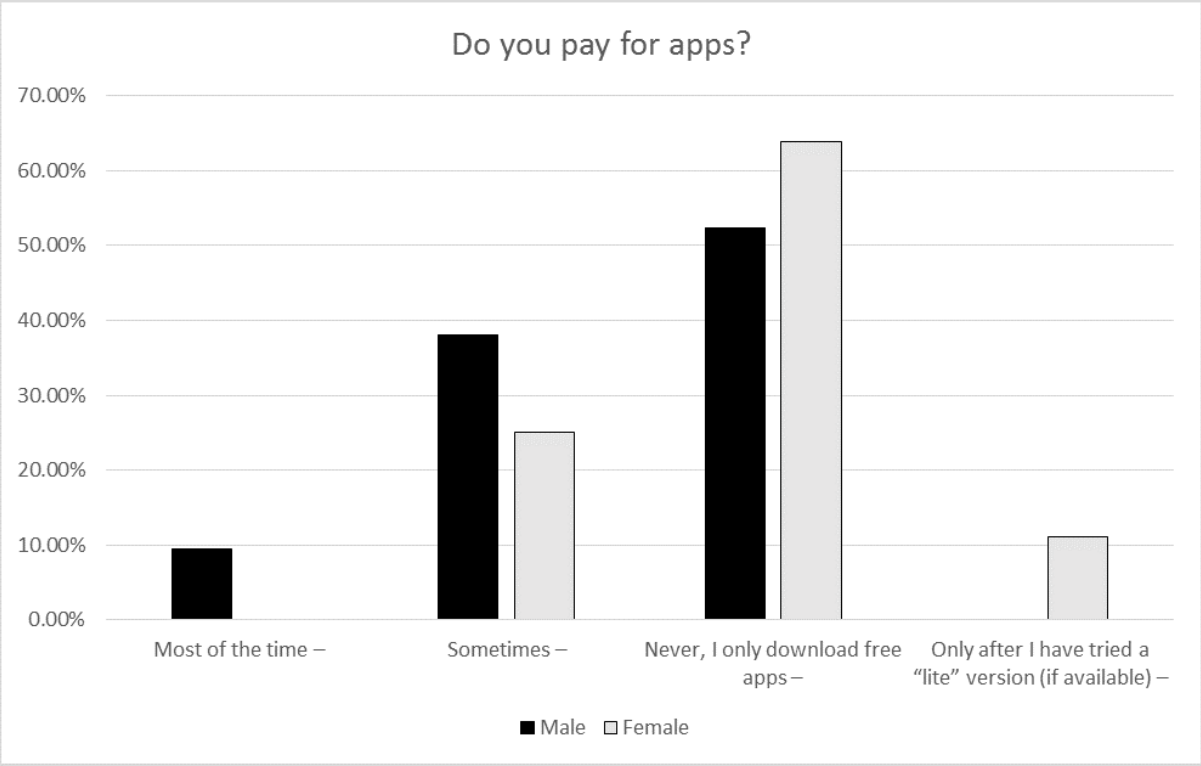

Figure 3: responses by male and female app users to the question of whether they pay for apps.

With regards to the participants' reasons for paying for apps or not, roughly the same proportion of men and women said that all language learning apps should be free (42.86% and 43.48%, respectively). Males seemed more likely to feel that apps represent good value for money (50.00%, compared to 21.74% of women), but

34.78% of women also responded that they think prices of apps are quite reasonable, compared to 28.57% of men. When comparing responses by age range, 57.14% of 31-40 year olds and 60.00% of 41-50 year olds said that apps should be free to use, compared to 25% of 18-30 year olds. 18-30 year olds were also slightly more likely to regard apps as good value for money (43.75%, compared to 28.57% of 31-40 year olds and 40.00% of 41-50 year olds). Although no respondent above the age of 50 regarded apps as "good value for money" or thought that developers should be rewarded, 66.67% of 61-70 year olds stated that prices were reasonable.

The interviewees were also divided on whether they were happy to pay for a language learning mobile app. Interviewee 2 argued that free apps are always as good as paid ones, and disliked the inability to try an app before committing to purchase it. She has never paid for extra content, and will always check the small print for any additional in-app purchases. Interviewee 2 stated that one can usually find what they want for free. Interviewee 4 also stated that he tries not to pay for apps if he can help it. The other interviewees were more willing to consider paying for apps, but with certain caveats. Interviewee 1 stated that she will always try a 'lite' version first, but would not "think twice" about paying for a good app. Interviewees 5 and 6 both stated that they would also pay for apps and have done so. The reputation of the app provider is also a factor for interviewee 7, who said that she would need to be convinced the app was "100% correct" before parting with her money.

5.5 Do learners think the use of apps contributes to their language learning?

In response to the question "Do you think using language learning apps has improved your knowledge of Spanish?", a large proportion of respondents stated that they felt that apps had improved their Spanish either "a lot" (32.79%) or at least "somewhat" (39.34%). Just over a quarter of respondents chose "a little" (27.87%) but nobody selected "not at all."

During the interviews, interviewee 4 stated that he would use apps as a reference now and again when he did not have his hardback dictionary on hand, but his usage of apps was "not every day" and "not for everything." Although he had used *Memrise* and described it as a good system with "a lot of repetition, "Interviewee 4 stated that he

found it difficult to keep on top of new words in the app, and has discovered instead that repeatedly writing out words to learn new vocabulary works better for him. He also believes that apps may have had a negative effect on his language learning, as he has been criticised for over-reliance on the sometimes too-literal translations provided online. In contrast, Interviewee 2 described herself as an “audio-visual learner” and finds that apps are more suited to her learning style. She finds reading much more difficult and books with “loads and loads of words” are not appealing. For Interviewee 7, apps such as *Memrise* offer a fun alternative to traditional methods of vocabulary learning.

Interviewee 5 stated that the convenience of being able to look up words/access information quicker has probably meant he has learnt more and the convenience aspect has also improved his Spanish. Interviewee 6, who is suffering from a serious health condition, also stated that having everything handy on one device makes it much easier for her to continue her studies while she is in the hospital, where she once may have struggled.

In the final question, questionnaire respondents were asked to share any final thoughts about learning languages with apps. Respondents brought up issues about reliability of apps in terms of software as well as content accuracy, mobility, convenience and ease of use. Several respondents mentioned that they found apps very useful to provide variety and a different experience from more traditional materials, as well as motivation to keep trying. The most common comments highlighted that, regardless of how useful they are, apps are supplementary to formal learning and not replacements for it; neither can they replace human interaction or living in a country where the target language is spoken.

6 Discussion

Most research into mobile applications and how they are used has focused on app users only, so it is interesting to contrast the differences among app users and app non-users in terms of age and sex, even if the numbers are rather small to draw meaningful conclusions. From a sample made up of 62.34% female and 37.66% male respondents, the fact that the gender split among app users was 63.79% male and 36.21% female strongly suggests that men are more likely to use apps. The

differences in age also suggest that younger learners are more likely to use them. The decrease by over 10% in percentage of respondents who do not use apps between the pilot study and the current study (both with students taking the same course) is an indicator that with time more learners are beginning to introduce apps into their set of resources to support their language learning. It is also worth noting that over 80% of app non-users own devices in which apps can be used, so device ownership is not the deciding factor for non-users (except perhaps Windows phone users, who made reference to the lack of language learning apps in the Windows app store). Instead, preference for traditional methods, reliability, limited knowledge of device and apps, and time were the main factors. This suggests that training on the potential of mobile devices and apps available for them, as well as how to evaluate apps for their own learning needs, would be beneficial for those who as yet do not use apps for language learning as it would help them make the transition from 'tech-comfy' to 'tech-savvy' (Pegrum, 2014).

It is not surprising that vocabulary and translation are the most popular apps used by the language learners in this study. First, because these are the most widely available types of language apps, and second, because they are the type of app that can be utilised to check meaning 'just in time' whilst doing something else (Traxler, 2007; Pegrum, 2014). It makes sense that grammar apps are also very popular, as these can be used for shorter or longer periods of time. Additionally, grammar apps as seen as convenient and rewarding to use; grammar is an area of language learning that modern pedagogies (e.g. communicative language teaching or learner-centred approaches) do not always place at the forefront of language learning, yet it remains something that students believe they need to master, regardless of their language level. The small number of available apps that focus on speaking and interaction is the obvious reason for their low use, although there may be other reasons.

The results show that learners use apps mostly spontaneously, but a considerable proportion also use them in planned study sessions; age seems to be a factor in this. Over 48% use language learning apps at least once a day, and men tend to use them more often but for shorter lengths of time than women. There is no clear reason why women use apps less often but for longer, and this may be worthy of further research to ascertain whether it is a design issue that developers need to take into account. In

terms of location where apps are used, the most popular answer was “at home,” which raises issues about how mobile the learning experience is, despite apps being used on mobile devices (Kukulska-Hulme & Traxler, 2005). As reported above, home use does not mean that they are used in planned study sessions as, within their homes, learners use them whilst doing other activities such as watching TV (19.64%) or in the bathroom (10.71%). This and the rest of the locations such as commuting, breaks at work, and waiting rooms suggest that engagement with learning apps may not be exclusive, and indeed users are engaging with other activities, which in turn suggests that the concepts of continuous partial attention (Stone, 2009) and the matter of distractions whilst engaging with mobile content (Kenning, 2007) are relevant to the use of apps. This result is of high relevance for app developers, and language learning app developers specifically, who will need to consider different levels of engagement when designing apps to attract and keep the user’s attention.

The choice of device for those that own both smartphones and tablets seems motivated mostly by convenience, although the design of the app and how it is used are important factors. Hence, dictionaries and translation apps are mostly used on smartphones for quick reference, but there are also examples of learners using them for extended periods of time, depending on their needs.

Regarding features of language learning apps, the responses from the learners who took part in this study in terms of most appreciated features (rapid access, convenience, portability, gamification elements, ease of use) and least liked characteristics (reliability, interface, design, advertising and customisation among them) provide a valuable starting point for reflection around app and task design. It is interesting that learners wish for apps that can cover all language skills, a more integrative approach to language learning, when most of them engage in appsmashing (using more than one app for a purpose) and know that they can get different things from different apps. A possible solution comes from the suggestion by one student for better synchronicity among apps so they can form part of a bigger personalised learning suite of tools.

Considering that most language learning apps provide very limited and impersonal feedback, mostly consisting of a simple tick or cross (or green or red) indication of

whether the answer is correct, it is surprising that over 40% of respondents consider feedback either good or very good. In many of the available apps, when learners provide incorrect answers, they do not get any support to help them understand why their answer is incorrect and they can only try again until they get it right by elimination. In part, their satisfaction with the limited feedback may be due to low expectations of what an app can provide. Additionally, most activity types in language learning apps tend to be multiple choice, filling in blanks with multiple choices, and matching exercises, activity types for which simple feedback might be seen as sufficient.

There seems to be a general attitude towards apps as something that should be free, both within and outside education, and this is reflected in the responses from the survey respondents and interviewees. The question of app payment is crucial for app developers; without generating income there is no business in app development, yet many users dislike advertisements and most are not willing to pay for apps or in-app purchases. Many providers, such as *busuu* or *Babbel*, use a subscription model. Although data about the percentage of app users who choose to subscribe is not publicly available, it can be presumed that this is a viable model for them. Others offer free access to a limited amount of content and sell further content through in-app purchases. *Duolingo* does not offer subscription or in-app purchases, which may be the reason for its popularity and dominance on the market. Instead, their revenue comes from offering crowd-sourced translations that companies, not users, pay for (Simonite, 2012). *Duolingo* has recently ventured into the language testing and certification market, and this may well be a direction that other app language providers will move towards.

It is clear from the results that learners who use apps feel that their use contributes to their language learning to some extent. This use is clearly supplementary in the case of the participants in this study, as they are enrolled in a language module. The extent to which apps contribute to their learning is not easily measurable, as different learners use apps for different purposes in different places, and engage in varied ways. Learners can choose to supplement their language learning with apps, which can constitute either a large or small proportion of their supplementary learning.

7 Conclusion, limitations and further research

7.1 Conclusion

This study has shed light on the practices and beliefs of language learners who choose to use apps to support their language learning, as well as some insights into those learners who choose not to use them. It is innovative in that it has produced the first comparison between app users and app non-users. It has also discussed the implications of the results in terms of app design and pedagogical practices.

Learners appear generally satisfied with what they are offered (although they wish for more and better quality content) which, considering that most do not and would not pay for apps, is perhaps appropriate. Some developers are striving for constant improvements, although others continue to use repetitive activities and focus on written language only.

Apps provide a good supplement for learners who are enrolled in formal instruction and a good starting point, perhaps primarily for independent learners. Anecdotal evidence seems to point towards a growing number of adults re-igniting their language learning (after some experience at school) by first using apps informally. Language learning apps may be a new way to attract students towards formal learning once they have discovered an appetite for languages and get past the basic language practice that apps tend to offer, something that would be welcome in areas where formal language teaching is in decline.

Finally, there is a case to be made for mobile device use training and potential for learning, including apps. Non-app using language learners may be unaware of mobile app potential, or may be reluctant to use them due to a lack of information or concerns surrounding data protection and online payments.

7.2 Limitations

A number of limitations affect this study. The data is self-reported and may be subject to the limitations that such research methods have (Paulhus & Vazire, 2007). In

addition, the participants are registered on a distance-learning course and may be more used to engaging in independent learning than students taking traditional face-to-face courses. Also, the comparison between app and app non-users is limited by the relatively small number of responses from app non-users.

Finally, no data was gathered on language acquisition gains or results from the course assessment. As this study was not designed within a language acquisition framework, no attempt was made to match questionnaire responses and course results for analysis. Additionally, causality between app use and linguistic outcomes would be impossible to measure with independent learners, due to the many different individual practices and levels of engagement reported.

7.3 Further research

It would be of great interest to replicate this research both in long and short-term studies. Software updates and new devices with improved and additional tools continue to appear in the market, and app use and mobile device ownership continue to grow. These changes mean that issues about what stops some device owners from using apps to support their language learning and the usage habits and beliefs of those who do will continue to be relevant for those interested in CALL and MALL, as well as language materials developers.

Whilst this study has provided a snapshot of app use among language learners enrolled in formal studies (as has also been the case with much of the previous research on language learning app use), it would be worthwhile to complement this data with research into how language learning apps are used by independent learners and what they think about learning in such a way, in particular among users who utilise apps as their main medium for learning. This group of learners are also more likely to be a reliable source of data on actual language gains, since they may not take part in other activities towards language learning which would make the effectiveness of app use towards language learning harder to prove. To supplement survey data, a future study to investigate informal learners who use apps for language learning could take an ethnographic or auto-ethnographic approach to generate rich qualitative data in a naturalistic setting.

Recommendations for practitioners:

It is important that learners understand how they can use any technology available to them to support their language learning. As evidenced in this chapter, some users of smartphones and tablets do not think of them as learning tools. It is advisable to encourage this use outside the curriculum, as, sooner or later, these learners will stop formal learning. Apps can support language learners as they become lifelong learners rather than students of a subject. A few moments spent in class discussing how students choose apps, sharing the apps they like best, how they find them and evaluate them could help learners support their studies, whether formal or informal.

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Appendix 1: Learner questionnaire

Survey on use of apps: this survey aims to find out more about the use of language learning apps. Your answers will be completely anonymous. It should take around 5 minutes to complete. By completing this survey, you give permission for the data collected to be used in an anonymous form in reports, presentations and published papers relating to this study for research purposes.

1 Are you?

Male Female I don't identify as either male or female

2 How old are you?

3 Do you own a smartphone (Galaxy, iPhone or similar) or tablet (iPad, Kindle Fire, Samsung or similar)? Please circle

Yes (please indicate which) Smartphone Tablet both

No

4 Do you use apps to support your learning of languages?

Yes (go to question 6) No (go to question 5)

5 If "no", why not? (After answering this question you may return your questionnaire)

6 Which device do you mostly use to access apps?

Tablet (e.g. iPad) mobile phone other (specify)

7 Which operating system does your device use?

iOS (Apple) Android Windows phone Other (specify) Don't know

8 Do you use Language learning Apps for:

Learning Teaching Both

9 How do you use Language learning apps? (Please tick one only)

Mostly in planned learning sessions (e.g. routine evening sessions)
More informally, as when and where the opportunity arises
Both of the above

10 How often do you use Language learning apps?

Several times a day Every day Several times a week

About once a week Less frequently than once a week

11 Where do you use language learning apps? (tick all that apply)

At home Commuting Quick breaks at work Waiting rooms

Whilst watching TV In the bathroom Any dead time I have other (specify)

12 Which specific areas do you use language learning apps for? (Tick all that apply)

Grammar exercises vocabulary reading writing listening practice

speaking practice translating interacting with others other (specify)

13 Do you use more than one app to learn Spanish?

Yes No

14 Which apps do you use to support your learning of Spanish? Give some examples:

15 Think of ONE specific app you use to learn Spanish. Which app is it?

16 How long do you normally spend using that App at a time?

Less than 5 minutes Around 5 minutes Around 10 minutes

Around 15 minutes Between 16 and 30 minutes Over 30 minutes

17 What do you think of feedback you get about your performance whilst using the app (e.g. on errors)?

Very good Good OK Not very good

Terrible I don’t get any feedback

18 What features do you like best in the language learning apps you use?

19 What features do you like least in the language learning apps you use?

20 What more would you like to get from Language learning apps?

21 Do you think using Language learning Apps has improved your knowledge of Spanish?

A lot Somewhat A little Not at all

22 Do you pay for Language learning apps?

Most of the time Sometimes Never, I only download free apps

Only after I have tried a “lite” version (if available)

23 Why? (tick all that apply)

They’re normally good value for money
The prices are quite reasonable
The developers provide a service and therefore should get money for it.
I think all Language learning apps should be free
They’re too expensive
I don’t have a way of paying

24 Please share any other thoughts you have about learning with Language learning apps.

Thank you very much for taking part in this survey. Please return it to your tutor.

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Abstract

Studies into the use of mobile applications (apps) for language learning have found many positive results about learner engagement with apps, but they have mostly focused on small samples of learners using an app selected by a researcher / educator for the purpose of the research rather than the apps that learners utilise of their own accord. This article presents the results of a study into the use of one of the most popular language learning apps in the market: the *busuu* mobile app (over 60 million registered users). The study surveyed registered active users of the app. Data were collected through an online questionnaire with 30 items, most of which were multiple-choice, with some open questions. The survey was distributed both in English and in Spanish. A link to the relevant survey asking potential participants to take part was sent as an in-app message by *busuu and* 4095 valid responses were collected. The results provide a profile of *busuu* app users, show patterns of use, their reasons for using it and what they find most valuable about language learning through apps.

1 Introduction: apps for language learning

In the decade or so since smartphones were introduced, these and subsequent similar devices such as tablets have become ubiquitous and are now used by large proportions of the population in most developed countries. Mobile applications (commonly referred to as apps) can be installed on these devices, and offer an enormous market of educational resources, including language learning. Early claims about the potential of apps for language learning included the possibility to learn, practise, and enhance both language skills and knowledge of the areas where target languages are spoken (Rosell-Aguilar, 2009). Several authors have identified benefits of apps for language learning (Burston, 2014; Godwin-Jones, 2011; Kim & Kwon, 2012; Lafford, 2011) based on their potential to engage learners in activities such as noticing, negotiation of meaning, learning by doing, focus on form and collaborative learning (Skehan, 2003; Doughty & Long, 2003), identified in the fields of Second Language Acquisition Theory (SLA) and Computer-Assisted Language Learning (CALL). Apps can provide opportunities to engage in interactive, meaningful and engaging tasks, promote collaborative, rewarding, and challenging tasks and provide

opportunities to produce target language, as advocated by Oxford (1990), Meskill (1999), Skehan (2003) and Chapelle (1998). The learning experience on apps has the potential of being mobile, depending on where learners choose to use them. As such, the study of language learning apps falls within the field of Mobile-Assisted Language Learning (MALL), which offers 'just in time learning' (Traxler, 2007) and learners can take advantage of free time for learning activity (such as listening to podcasts) as they carry their devices with them.

As with every language learning resource, the quality and potential for language learning of apps varies enormously. Some authors have highlighted drawbacks about language learning apps: Pareja-Lora et al (2013) questioned the match between pedagogical and technical qualities of language learning apps and their value for language teaching, claiming that they can provide very fragmented language practice. Burston (2014) claimed that learning activities on mobile apps were basic and mostly replicated what was done before with other technologies, and Kim and Kwon (2012) noted that most apps focus on cognitive processes and receptive language skills and lack the opportunities to engage in socio-cognitive activities or opportunities for collaborative learning.

Whilst it is arguable whether apps can at this point be considered as a single solution to language learning, they can effectively support learner autonomy and interest in learning a language (Goodwin-Jones, 2014). Apps can provide a good supplement for language learners who are enrolled in formal instruction as well as a good starting point for beginner independent learners. They can also provide regular practice for language learners who are no longer formally studying a language but wish to keep practising it (Rosell-Aguilar, 2016).

2 Literature review

2.1 Previous research on the use of apps for language learning.

Since the appearance of apps that can be used for language learning, many researchers have investigated the student experience of learning with them. A common finding among these studies has been a very positive attitude towards

learning with apps (Brown, Castellano, Hughes & Worth, 2012; Castañeda & Cho, 2016; Khaddage & Lattemann, 2013; Kim, 2013). In a study with 134 language learners, Steel (2012) found that the features the participants in her study liked best from the language apps they used were flexibility, convenience, portability, and the ability to personalise their learning as well as the mobile learning experience.

Research has also found improvements in several language skills. Steel (2012) found that vocabulary, reading and writing, grammar and translation activities were the areas that students benefitted most from. Morgana (2015), carried out a study with 43 16-year-olds using iPads to support their formal studies of English as a Foreign Language (EFL) in Italy. Her students found the devices, and the apps they used with them, particularly useful for listening practice, followed by writing and, to a lesser extent, speaking. In another study with 40 EFL students, Zou and Li (2015) found very positive attitudes towards using an app they had developed for listening skills as well as pronunciation practice. Their students particularly valued the convenience of using their mobile devices to practise the language outside class. Kim (2013) reported improvements in listening comprehension among a group of Korean students learning English with apps, and in a study with young learners using apps to support their learning of English as a second language, Yildiz (2012) found positive effects on vocabulary acquisition, phonological awareness and listening comprehension skills. Castañeda and Cho (2016) carried out a study with 33 undergraduate students of Spanish, who showed significant improvements in verb conjugation knowledge after using a conjugation app. Rosell-Aguilar and Kan (2015) reported that the majority of participants in their study of 137 learners using an app to learn Chinese characters felt that they had improved their recognition of characters and words as well as their ability to write the characters. Over 96% of the participants in their study also reported that using the app had helped to improve their knowledge of Chinese.

Most of the research into the evaluation of education apps mentioned above has focused on teacher-led initiatives using one specific app within their educational setting, rather than as an informal or self-initiated learning activity. Steel (2012) argued that mobile devices can maximise students' time to make the most of their learning activities outside class and advocated for more studies into student use of apps outside formal tuition. Similarly, Chen (2013) claims that mobile devices foster learner

autonomy and ubiquitous learning in informal settings. While there has been a body of work that looks at mobile device activity in the classroom, there has been a significantly smaller amount of research examining how learners engage in mobile learning outside of the classroom (Stockwell & Liu, 2015). Rosell-Aguilar (2016) carried out a study with 85 distance learners of Spanish and found that the main area of language learning for which respondents used apps was vocabulary (82.26%), followed by translation (66.13%), and grammar practice (58.06%). The majority of language apps users in his study stated that they used apps informally, as and when the opportunity arose (60%), rather than in planned study sessions. Regarding frequency of app use, 16.39% of respondents used them several times a day, 27.87% used them every day, 36.07% several times a week, 8.20% about once a week and 11.48% less frequently than once a week. The study found that female respondents used apps less frequently but for longer periods of time. Respondents stated that they felt that apps had improved their knowledge of Spanish either “a lot” (32.79%) or “somewhat” (39.34%). A further 27.87% of respondents chose “a little”, but the option “not at all” was not chosen by any participants.

As Stockwell and Hubbard (2013) point out, learners make their own use of apps which may be quite different from what their designers imagined. Few studies have researched students' personal use of apps for language learning and the benefits that students perceive from engaging in such activity. An example of such research is the *Duolingo* Effectiveness Study (Vesselinov & Grego, 2012), which was undertaken with learners who were not selected because they belonged to the institution where the researcher works, as had been the case in many other studies. Instead, the participants were users of *Duolingo*. This app falls under the descriptor of full language learning package apps according to the taxonomy by Rosell-Aguilar (2017b) as it is designed specifically for language learning purposes and targets several skills, presenting itself as an all-in-one language learning solution. The study looked into the learning experience and outcomes of 88 native speakers of English learning Spanish at beginner and intermediate level. Their average age was 34.9 years and their reasons for learning were personal interest (68.2%), business / work (18.2%), travel (11.4%) and school (2.3%). The results showed statistically-significant improvements in language ability as well as confidence, linked to motivation and level of Spanish. Participants who studied because they wanted to travel achieved the largest

improvements, and those whose motivation was personal interest the least. In addition, learners who were at beginner level made bigger gains than advanced learners. There were high levels of satisfaction with the app

The study reported in this article also involves users of a full language learning package app: the *busuu* app.

2.2 Previous research into the effectiveness of the *busuu* app

The *busuu* app is part of the *busuu* network for learning languages, which also comprises a web app as well as social media engagement. *busuu* was currently has over 60 million registered users (Busuu, 2016). It offers 12 different languages organised in levels according to the Common European Framework of Reference for languages (CEFR). Within the levels, didactic units are organised by language function or semantic field. The app runs on Android and iOS operating systems. Learners have to register to use it and can choose to learn one or more languages. Learners can use the free materials or upgrade to a premium paid-for membership. The activities within the app practise reading, writing, and listening skills as well as vocabulary and translation. Activity types include drag and drop, multiple choice, filling in blanks, and free writing, which can be shared with other users to obtain peer feedback and corrections. The app can be used offline if users download learning units.

Research into the use of *busuu* has been limited, but some studies have taken place. In a pilot study using the *busuu* app, Kétyi (2013) surveyed 59 Hungarian students of German who were given a free 7-day premium membership trial. The service was well received, with 79% of participants rating it as either good or very good. The most beneficial aspect for the participants was learning vocabulary as well as revising and practising the language, and the strengths they identified were making language learning playful and easy as opposed to overwhelming, the use of audio for pronunciation, and the selection of topics and vocabulary, which they found useful for common situations. The only drawbacks mentioned by participants were that some found the tasks too easy and repetitive. After the free trial, 92% of participants indicated that they would not pay for premium membership. Kétyi (2015) followed up his study with another research project in which the experiences of an experimental

group of 51 students using the premium version of the *busuu* app were compared to the experiences of a control group of 43 students. The experimental group were mostly unfamiliar with the app before the study. During the two-month study the participants reported using the app on their smartphones about once a week for an average of between 10 and 15 minutes. Over 73% of the *busuu* users thought that the app could help with their language learning and respondents found the app particularly useful for vocabulary and practising writing skills. The experimental group saw a rise in motivation and a statistically-significant increase in their target language performance, whereas the control group did not. Despite the positive experience, the participants considered that the help provided by the *busuu* app was limited, and the vast majority indicated that they would not pay for the app after the trial period. In a separate study, Malerba (2015) found that learners particularly appreciated the flexibility of learning at their own pace, but the limited number of activity types was their main reason for abandoning such language learning platforms.

3 Research questions, methods and participants

3.1 Research questions

More data is needed to understand the ways learners engage with apps of their choice for language learning to create a realistic picture of users in their own settings, as opposed to most previous research, which had focused on learners using an app as directed by their teacher / researcher. The main questions this research wants to address are:

- Who uses the *busuu* app? What for? How do they use it?
- What do users think of the *busuu* app? What features do they like best / least?
- Do users think that using the app has improved their knowledge and use of the language(s) they are learning? Which skills do they think they have improved most?
- What patterns of use of the *busuu* app can be identified from respondents? And do different patterns of use reflect users' attitude towards the app?

3.2 Methods

An online survey was developed based on a previous study into use of apps for language learning (Rosell-Aguilar, 2016) but tailored to the specific features of the *busuu* app. The survey consisted of 30 items, most of which were multiple-choice, with four open follow-up questions asking participants to provide further details depending on their replies, and three standalone open questions (see Appendix 1).

The research was approved by the University Human Research Ethics Committee (Ref: HREC/2016/2212/Aguilar). The questionnaire was hosted at the university survey site with servers in the UK, complying with European regulations on data hosting and storage. An agreement was entered into with the Head of Education at *busuu*, who offered to distribute the link to the survey. Nothing was asked for in exchange, other than being able to see a summary of the (anonymised) results.

The survey was available in two languages: English and Spanish, both with the same questions in the same order. A link to the relevant survey asking potential participants to take part was sent as an in-app message by *busuu* to their registered users, therefore ensuring that respondents were active users before the start of the research. The users were selected among those who had chosen to use the English or Spanish interface within the *busuu* app. Sending the call for participants as an in-app message ensured that respondents were app users. No incentive was offered for taking part in the study. The surveys were open for three weeks in May 2016 and a total of 4102 unique responses were collected: 2272 for the English survey and 1830 for the Spanish one. Among the English responses, seven were removed as they included nonsensical or explicit replies, therefore the number of valid English responses was 2265, making the total n=4095. As none of the questions in the survey were compulsory, not all questions received the same number of responses.

The results were first analysed using the online survey's own statistics tools. In addition, SPSSv21 was utilised for comparative statistical analysis. Bias analysis was not possible as no information about app non-users was collected. The responses to open questions were categorised using thematic analysis.

3.3 Participants

Some 50.4% of respondents identified as male, 48.5% as female, and 1% chose to identify as neither male nor female. The largest proportion of respondents (34.4%) were in the 18-25 group, followed by the 26-35 group (21.3%) and the under 18 group (16.1%). The remaining age groups were 36-45 (11.8%), 46-55 (8.3%), 56-65 (5%) and those over 65 (3.2%). Participants were asked where they lived. Table 1 shows the responses to this question presented in columns with the total number of respondents (from both English and Spanish surveys) followed by the English-language survey only and the Spanish-language survey only.

	All	English	Spanish
Europe	917 (23.1%)	651 (29.7%)	266 (14.9%)
USA / Canada	325 (8.2%)	275 (12.5%)	50 (2.8%)
Mexico / Central / South America	1235 (31%)	58 (2.6%)	1177 (64.3%)
Africa	221 (5.6%)	218 (9.9%)	3 (0.2%)
Middle East	227 (5.7%)	222 (10.1%)	5 (0.3%)
Asia / Australia / New Zealand	624 (15.7%)	617 (28%)	7 (0.4%)
Rest of the world	429 (10.8%)	155 (7.1%)	274 (15.4%)
Total	3978 (100%)	2196 (100%)	1782 (100%)

Table 1: geographical areas where participants live.

Most respondents (79.1%) were learning one language. A further 14.6% two languages, 3.5% three, and 2.8% more than three languages. Participants were asked to select which language they were learning with the *busuu* app. Those who had indicated they were learning more than one were asked to select the main one they were prioritising. In Table 2, the languages are presented in three columns: all respondents, respondents to the English-language survey and respondents to the Spanish-language survey. In addition, 80% of all respondents indicated that they did not live in a geographical area where the language is spoken, whereas 20% did. This varied to a large extent between the English and Spanish versions of the survey. In

the English version results, the split between those who lived in a target-language-speaking area and those who did not is 71/29% whereas in the Spanish version the split was 90.7/9.3%.

	All	English	Spanish
Chinese	58 (1.5%)	36 (1.7%)	22 (1.2%)
English	1585 (40.5%)	638 (29.8%)	947 (53.4%)
French	531 (13.6%)	298 (13.9%)	233 (13.1%)
German	433 (11.1%)	286 (13.4%)	147 (8.3%)
Italian	271 (6.9%)	114 (5.3%)	157 (8.9%)
Japanese	281 (7.2%)	197 (9.2%)	84 (4.7%)
Polish	31 (0.8%)	24 (1.1%)	7 (0.4%)
Portuguese	151 (3.9%)	43 (2%)	108 (6.1%)
Russian	87 (2.2%)	52 (2.4%)	35 (2%)
Spanish	325 (8.3%)	311 (14.5%)	14 (0.8%)
Turkish	159 (4.1)	139 (6.5%)	20 (1.1%)
Total	3912	2138	1774

Table 2: Languages studied with the *busuu* app by respondents

Participants were asked to select the level they consider themselves to be in the language they are learning with the *busuu* app. Most learners identified as Beginner / A1 (2067, 52.8%), followed by Elementary / A2 (912, 23.3%), Intermediate / B1 (641, 16.4%), Upper Intermediate / B2 (204, 5.2%), Advanced / C1 (68, 1.7%), and Nearly Fluent / Fluent / C1 (25, 0.6%).

The respondents' reasons for learning the language they selected were varied. Respondents were allowed to select more than one reason. The most popular,

selected by 29% of respondents, was 'personal interest'. This was followed by 'I want to use the language when I travel' (17.1%), 'relevant to my career aspiration or profession' (16.1%), 'I want to study / live overseas' (15.2%), 'I want to use the language to communicate with family / friends' (11.2%), and 'relevant to my current studies' (7.1%).

Of the 3,596 participants who responded to a question about whether they paid for premium membership for *busuu* additional content and services, 2614 (72.7%) selected 'no' and 593 (16.5%) 'yes'. A further 389 (10.8%) did not know whether they pay for premium membership or not.

4 Results

The results from both surveys are presented here. Where relevant, distinctions will be made between the data from the English language survey and the Spanish language survey.

4.1 Use of the app

Participants were asked which device they used most to access the *busuu* app. Most respondents (63.4%) used their smartphones and a smaller proportion (35%) used tablet devices. Only 1.6% expressed a preference for the smartwatch version of the app. With regards to the length of time participants have been using the app, 43.2% have been using it for less than a month, 31.6% between one and six months, 7.2 between seven and 12 months and 18.1% over a year. Respondents were asked how often they used the app and long they normally spent using it at a time. Figure 1 shows the replies to these questions correlated with gender.

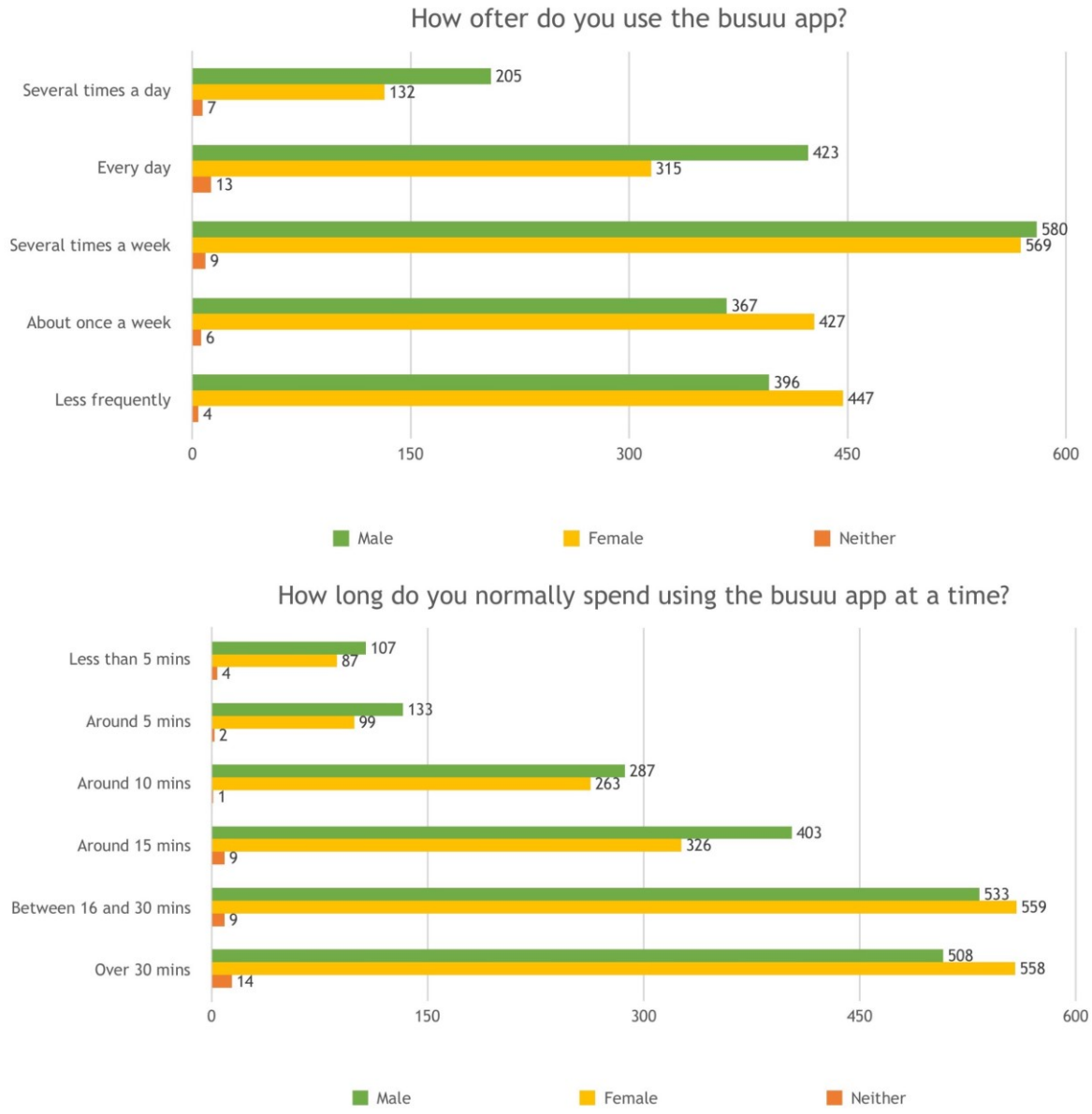

Figure 1: Frequency and length of use of the *busuu* app by respondents.

To ascertain whether users perceived using the app as a formal or informal language learning activity, they were asked whether they use the app mostly in planned learning sessions (e.g. routine evening sessions) or more informally, as an when the opportunity or need arises. One third of respondents (33%) selected the former and the remaining 67% the latter. Furthermore, participants were asked what else they did to learn the language they are learning with the app. Some 23.9% were using the app to supplement other, more formal, activities such as being registered on a course at school / college / university, or taking part in private tuition or conversation classes.

The remaining 40.2% were not registered on a course but used additional language learning resources independently, and 35.8% claimed that the *busuu* app is the only resource they use to learn the language. Those who used additional resources independently were asked to indicate what other resources they use (participants were allowed to select more than one). The most popular were websites (27.9%), followed by books or ebooks (23.9%), other apps (17.4%), DVDs or online videos (12.3%) and CDs/mp3s/podcasts (22%). As a follow-up question, respondents were asked to select what types of app they used in addition to *busuu* from a number of choices. Respondents were asked to select all that applied and a total of 5363 responses were collected. Almost half of those responses (2520) selected self-study language apps other than *busuu* such as *Duolingo* (50.8%), *Babbel* (13.9%), *Rosetta Stone* (8.9%), or *Speakeasy* (4.6%). The other 21.7% did not specify the name of the language learning apps they use. The second most-popular choice among additional apps respondents use was translation apps, with 1043 responses (19.4% of the total). Third was dictionary apps (872 responses, 16.3%) followed by News apps in the target language (350 responses, 6.5%), Flashcard apps such as *Quizlet* or *Memrise* (310, 5.8%) and apps that facilitate communication exchanges among learners such as *Tandem* or *HelloTalk* (162 responses, 3%). An open question asking respondents to name other apps they use highlighted the use of *YouTube* and *Skype* as well as social media apps (*Facebook*, *Twitter*, *Instagram*) to engage in language learning activity.

4.2 Beliefs and impressions of learning with the app

4.2.1 What they liked and disliked

Participants were asked to select up to three features that they liked best in the *busuu* app exercises. The best-liked feature was vocabulary practice, with 20.3% of responses. This was followed by listening practice (16.6%), grammar practice (15.1%), reading practice (13%), writing practice (12.1%), translation practice (9%), receiving feedback on their writing from other members of the *busuu* community (6.9%), and correcting other members' writing (6.5%). A further 0.5% selected 'other'.

Similarly, participants were asked to select up to three features they liked least. The least-liked feature was writing practice (14.8%), followed by grammar practice

(14.2%), correcting other members' writing (12%), listening practice (11.5%), reading practice (11.3%), vocabulary practice (10.5%), translation practice (10.8%), and receiving feedback on their writing from other members (8.8%). A further 5.8% selected 'other'. Among these, the most common comment did not relate to pedagogical features or activity types, but to the fact that premium membership is required to access the full content of the app. Other comments referred to some software glitches or crashes, the chat facility, and lack of oral practice exercises.

The quality of the automated feedback that users receive from the app (which within the app is limited to whether the answer is right or wrong) was positively regarded. Of the 3751 participants who replied to the question about feedback quality, 43.8% considered it 'very good' and a further 32.3% rated it 'good'. Some 14.4% rated the feedback 'OK' and 2.5% and 0.7% rated it negatively as 'not very good' and 'very bad' respectively. The remaining 6.3% claimed that they did not receive any feedback.

Respondents were provided with a number of choices about what else they would like the app to provide. They were allowed to select all the choices they considered relevant. A total of 19,482 responses were collected, and the results appear in Figure 2 in order of popularity. the comments provided by those who selected 'other' mainly refer to making the premium content free. Other comments that recur suggest the use

of video materials as stimuli for activities and the provision of audio and text chat for communication among learners and native speakers.

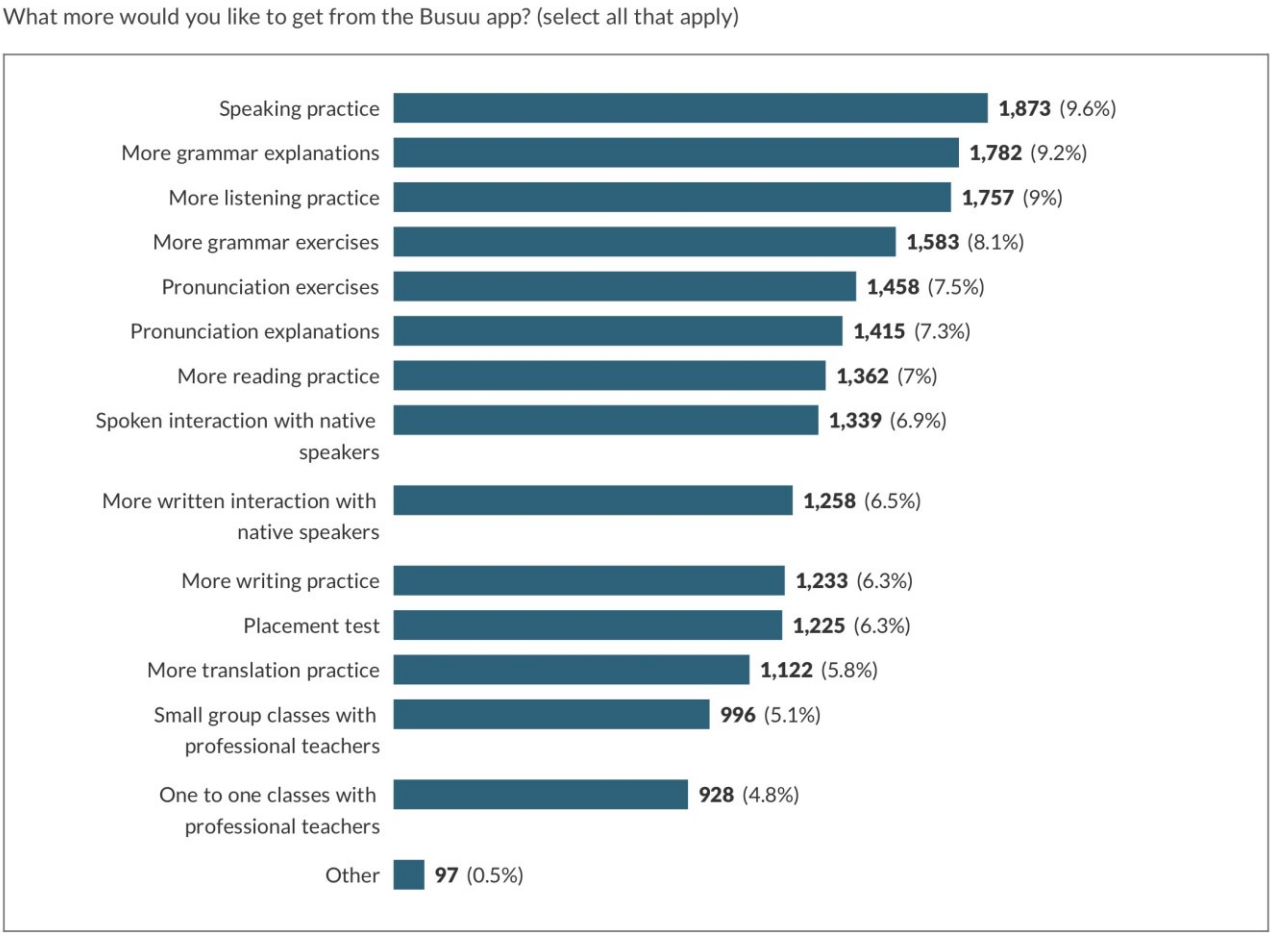

Figure 2: additional features users would like the *busuu* app to provide.

4.2.2 Expectations and performance improvement

With regards to expectations of the app, the participants' most popular expectation when they downloaded it was to improve their speaking skills (selected by 15.6% of respondents), followed by listening skills (13.6%), reading (11.5%), and writing (11.1%). The fifth most popular expectation (with 10.8% of responses) was to become fluent in the language, followed closely by improving vocabulary (10.8%), grammar (9.8%), and translation skills (8.6%). The remaining expectation, selected by 6.3% of respondents, was to meet people with whom to practise the language. Finally, 1.9% of respondents indicated that they had no expectations when they downloaded the app. The app is well rated in terms of meeting expectations, with 30.5% of respondents

stating that the app is better than they expected and 61.9% rating it 'as expected'. Only 7.7% of respondents rated the app 'worse than expected'.

To produce an overall snapshot of how useful participants found the app, they were asked to what extent they agreed with the statement 'using the *busuu* app has helped me improve my knowledge of the language I'm learning'. A total of 3,541 participants responded to this question. Some 25.4% strongly agreed, 57.4% agreed, and 15.3% neither agreed nor disagreed. In contrast, 1.5% of participants disagreed and 0.5% strongly disagreed. Similarly, participants were asked to rate the overall quality of the *busuu* app. Out of the 3565 responses received to this question, 38.7% rated it 'very good' and 47.5% rated it as 'good'. Some 12.4% of participants gave the app an 'OK' rating and 1.5% gave a negative rating: 1.2% rated it 'not so good' and 0.3% rated it 'very bad'.

When asked to select the area that participants thought they had improved the most, 27.7% selected 'vocabulary'. This was followed by 'speaking' (16.2%), 'listening' (12.9%), 'grammar' (11.1%), 'reading' (8.6%), 'writing' (7.6%), 'pronunciation' (6.8%) and 'translation' (3.9%). A further 5.1% of respondents selected 'none'.

4.2.3 Paying for content, further thoughts, and assessment

Among those participants who pay for premium membership, their reasons for paying were to gain access to additional content (35.6%), because it represents good value for money (27.4%), to motivate them to keep using it given that they're paying for it (14.4%), and access to support (14.3%). The remaining 8.2% selected 'other', with most replies coming from respondents who did not pay for premium membership and wished to express their disappointment at the restrictions that this entails. Among participants who do not pay for premium membership, their reasons for not subscribing to this service were the belief that language learning apps should be free (43.2%), not having a way of paying (29.4%), finding the cost too expensive (9.8%), and worries about the safety of online payments (6.1%). A further 4.3% were not aware of the premium membership option and 7.2% selected 'other' as their choice. Those who provided details after selecting 'other' mostly referred to the cost issue.

A total of 1,146 participants provided responses to an open question asking them to provide any further thoughts they had on the app. The thematic analysis categorised the replies into 5 groups: positive, negative, comments regarding cost, requests for further content or functionality, and other. Some responses were coded into more than one category as some participants' comments covered several of these, so the total number of comments categorised amounted to 1,279. Of these, 46.8% were positive. Comments in this category ranged from generally positive such as "OK", to very enthusiastically positive, such as "awesome", "ideal", "revolutionary", "inspiring" and "perfect". Respondents praised the flexibility provided by the portability of app, its interface and graphics, the ease of being able to practise different language skills within one app, and the community formed among learners. A total of 6.4% of comments were categorised as negative. The issues most commonly mentioned in this category included software bugs /crashes, problems logging in, customer service, finding the level too difficult for beginners (particularly for languages with characters other than the Latin alphabet such as Russian, Chinese and Japanese learners), poor interface, and monotonous / repetitive activity types. Some respondents compared the app to other apps (mostly *Duolingo*) unfavourably and several comment on the app giving access to fewer tools than the website version of *busuu*.

Some 14% of responses were categorised under "cost". These comments refer to the pricing for the premium membership being too high or a preference for a one-off payment rather than a monthly subscription. The majority of comments on this section reflect the respondents' beliefs that apps for language learning should be free. Among the 200 comments categorised as requests for further content or functionality (17.2%), the most common were requests for more grammar explanations / practice, oral practice and pronunciation exercises. Many respondents also missed the ability to use synchronous audio / video chat with native speakers, which used to be available on the app and remains available on the website version. Other requests include the addition of further languages, the use of more video, certification of attainment, and provision of online tutorials. Finally, 200 comments were categorised as "other". Of these, 18% were from respondents who left comments to indicate they had no further comments, 31% did not provide an answer to the question (questions about membership, irrelevant comments and comments referring mostly to their beliefs about language learning journey unrelated to the *busuu* app), and the rest referred to

their experience of using the app. Among these, there were many reflections on issues relevant to informal and distance learning such as self-management, discipline, keeping motivated, commitment, and effort.

The final question asked participants whether they would be interested in taking some form of assessment leading to a certification in the language they study if *busuu* offered one. Most of the 3,579 respondents to this question showed an interest in assessment: 41.6% chose 'yes' and 51.8% 'yes, but only if it was free'. The remaining participants (6.6%) selected 'no'.

4.3 Patterns of use

Respondents were able to select one of four categories to describe the length of time they had been using the *busuu* app. They were also asked how frequently they used the app, ranging from multiple times per day to less than once a week. From this data, six sub-groups were identified:

1. Consistent users: those who have been using the app for more than one month, and use it every day (n = 415).
2. Enthusiasts: they use the app frequently (at least once every day), but have been using the app for less than one month (n = 679).
3. Committed users: they use the app several times per week and have used the app for a period of more than 7 months (n = 830).
4. Casual users: they have been using the app between once and six months and use it several times a week or fewer (n = 981).
5. Probing users: those who have been using the app for less than a month but have used it several times a week (n = 449).
6. Visitors: they use the app infrequently (once a week or less) and have been using the app for less than one month (n = 539).

Group membership (1-6) was used as a new independent variable to determine whether patterns of usage reflected users' attitude towards the *busuu* app in the Likert-type items. One-way analysis of variance (ANOVA) and post-hoc Tukey honest significant differences (HSD) tests were then used to identify statistically significant differences between groups. Due to the number of statistical tests being carried out,

Bonferroni correction was used to identify a stricter level of significance to reduce the likelihood of type I error ($p < .003$). Findings are presented in Appendix 2.

One-way ANOVA suggested that the six groups were appropriate for identifying different response patterns in the data. Patterns of use were indicative of users' attitudes towards the app and its utility for language learning, as there were significant differences ($p < .001$) for fifteen of the items for which significance testing took place. The largest effect sizes were associated with items three items. The first item indicated that those who have used the app for longer periods tend to use it for longer each time they open the app. The second item indicated that the longer individuals use the app, the more likely they are to indicate that it has had a positive effect on their language learning (Table 3). Finally, the third item indicated that the longer that individuals use the app for, the greater the likelihood that they will pay for premium content.

The most unique group across all items was group 6, the visitors, which was significantly different from all other groups in four items. This group were the least likely to upload examples of their writing and request feedback, used the app for a shorter period than other groups, and were therefore the most likely to state that the app had not had a positive impact on their learning:

	24. "Using the *busuu* app has helped me improve my knowledge of the language I'm learning"					Total
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	
Consistent users	128	195	26	4	3	356
Enthusiasts	213	303	58	5	1	580
Committed users	186	462	126	9	1	784
Casual users	189	554	155	15	7	920
Probing users	90	251	53	4	1	399
Visitors	75	242	117	13	5	452
Total	881	2007	535	50	18	3491

Table 3. User groups' attitudes towards the *busuu* app

5 Discussion

There was a good gender balance between respondents. The correlation between gender and frequency and length of use of the app shows that female users tend to use the app less frequently but for longer periods of time, which is consistent with previous research by Rosell-Aguilar (2016). The frequency of reported use was much higher than previous studies into the use of *busuu* (Kétyi, 2015). One key difference between the participants in Kétyi's research and this study is that Kétyi introduced his participants to the app, whereas the participants in this research are already familiar with it. This probably explains the difference in terms of frequency of use and also in willingness to pay for the premium service.

The language of tuition marked an important difference among respondents. The results suggest that a large number of users, Asian learners in particular, choose to learn English through an English interface. This is supported by the fact that 29.8% of respondents to the English-language survey were learning English, whereas only 0.8% of those who took the Spanish-language survey were learning Spanish.

With regards to language level, levels A1 and A2 accounted for 76.1% of respondents. This supports the claims that apps attract and are support learners at beginner level (Vesselinov & Grego, 2012). The most popular reason for learning in this study was 'for personal interest', which had been identified as less conducive to language learning with apps by previous research (Vesselinov & Grego, 2012). It was counterintuitive that 'relevant to current studies' was the reasons for using the app that received the lowest percentage, as it might have been anticipated that supporting formal learning would be a popular reason to use app, particularly as almost 24% of respondents are registered on a formal tuition course.

In terms of expectations, a much higher proportion of respondents expected to become fluent by using the app than in previous research (Rosell-Aguilar & Kan, 2015). On the one hand it is positive that users perceive apps as potential full language learning solutions, as that may lead to more use and engagement with the activities provided.

On the other hand, it is at this point unrealistic to expect fluency from just using one app, and the fact that those who indicated they expected to become fluent were less positive about the app shows that unrealistic expectations led to disappointment about their language learning progress with the app.

The overall positive impression of the app matches the findings from previous research into the use of apps for language learning and into the *busuu* app in particular (Kétyi, 2013, 2015). Also consistent with Kétyi's research is the fact that learning vocabulary was the skill that users considered to have benefitted most from.

The responses to the open question inviting participants to provide further thoughts were also very positive and the number of negative responses was relatively low. These comments highlighted the high expectations that users have of what can be achieved from using an app, as the requests for more grammar, more interaction, more variety of activity types demonstrate. The fact that respondents were overwhelmingly interested in some sort of certification of their informal studies with the app supports the idea that learners are willing to accredit their informal learning. With nearly half of these indicating that they be willing to pay for the accreditation, this is a direction where app developers might want to go to monetise their business.

6 Limitations, further research and conclusion

6.1 Limitations

Since no previous research into language learning from a commercial app using in-app messages as the call to participate has been published before, it is not possible to comment on the return rate and its comparability to previous studies.

The data collected for this study is self-reported and therefore subject to the limitations that such research methods have (Paulhus & Vazire, 2007). Although no incentive was offered for participating in the research and it was clearly stated that the study was carried out by a university researcher, it is a possibility that some respondents may have been inclined to offer positive responses due to the fact that the call for participants came from within the *busuu* app. The questionnaire did not manage to

capture the voices of the infrequent visitors who did not take up the app as part of their language learning and which features dissuaded them, and how these could have been improved.

The anonymous nature of the data collection meant that the data collected could not be matched to data available to *busuu* on factors such as frequency of use or performance, it also meant that respondents could not be invited to participate in qualitative interviews. Among other reasons, this was not part of the research design because any data collected for this purpose would be flawed due to the many different individual practices and levels of engagement reported, therefore making it impossible to demonstrated causality between app use and linguistic outcomes.

6.2 Further research

Some of the limitations of this study listed in 6.1 provide possible lines of inquiry for further research: a smaller study could select a number of users to complete the survey and, with their permission, correlate this data with the data that *busuu* collects from its users. Furthermore, these participants could participate in qualitative interviews and undertake pre- and post-texts to track language acquisition progress for a number of selected items taught in the app. It would also be of interest to survey users who stop utilising the app to find out why they did so.

6.3 Conclusion

This article advances the field of mobile apps for language learning by providing the first large-scale study of app users. It is innovative in its methods, by sourcing the data collection directly from within the app. It provides the first profile of independent language learning app users and also the first statistically-supported attempt to categorise learners by their use of the app. The results provide a vast amount of information about the preferences of app learners and their views of language learning through mobile apps. These should be helpful to learners, language learning app developers and language teaching professionals.

The results from this study show that users engage with apps and have very positive impressions, but lack of 'real' interaction ranks high on learners' wish lists. Recent developments such as *Duolingo*'s chatbot bring the learner one step closer to interacting, albeit with limitations, in the target language. Even though this interaction is (for the time being) limited to textual output, learners can make use of the speech-to-text tool on their devices to enhance the oral element of the interaction. The recently-released 'friends' feature on *busuu* provides the opportunity for learners to interact in a closed environment with chosen peers and gain confidence without exposing themselves to making errors in public.

The very positive views and expectations about the potential of apps for language learning suggest that a number of users now consider apps a credible and reliable source of language learning. This carries with it a certain level of expectations about the amount and quality of features provided that may be difficult for some providers to achieve at this point, but paves the way for further developments and directions in language learning through apps. The issue of mismatch of expectations and what can be achieved with apps for language learning is likely to continue for some time. Whilst it is unlikely that a learner would pick up a grammar or exercise book and expect it to provide a full language learning experience inclusive of interaction with other target language speakers, this seems to be the case with language learning apps. This is not an unreasonable expectation: users know that they can use their mobile devices to interact with other people in real time using text messaging, audio and video calls, as well as social media, so it makes sense that they should be incorporated into the learning experience. In part, this assumption is fuelled by the publicity materials from some app providers continue to market them as full language learning solutions.

Many of the features that users wish for are already available to language learners through their mobile devices. The device native tools (making calls, messaging etc) as well as wide range of apps and services for finding partners for exchanges, participating in one-to-one tutorials, watching and listening to authentic content, and much more, can create an immersive environment for the language learner and some do use these features. However, many learners seem to want an all-in-one solution within the same app rather than engage in app-smashing to achieve this. Apps such as Apple's *Health* app provide a dashboard that can incorporate activity tracked from

other fitness apps (such as swimming or running) into a single interface, and this is a model with great potential for language learning. A single app that incorporated, for example, grammar explanations from one app, exercises from another, vocabulary from a flashcard app, availability of partners from an e-tandem app, and culturally-rich authentic content from media apps into a single dashboard would provide a single-solution immersive environment for language learners. Whether this is the future of language learning through apps remains to be seen.

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Appendix 1: Survey on use of the *Busuu* app

Survey on use of *Busuu*: This research survey aims to find out more about your use of the *Busuu* app. It should take 5-10 minutes to complete. The survey is part of research carried out at The Open University into the use of language learning apps, i.e. it is not a market research survey on behalf of *Busuu*. Your answers will be completely anony-mous. You may withdraw from the survey at any time by exiting this page. You may skip questions if you wish. To find out more about this project, data protection, and how the data will be stored please follow this link: [Link was provided].

1 Are you?
Male
Female
I don't identify as either male or female

2 How old are you?
Under 18
18-25
26-35
36-45
46-55
56-65
Over 65

3 Where do you live?

UK / Ireland
Rest of Europe
USA / Canada
Mexico / Central and South America
Africa
Middle East
Asia
Australia / New Zealand
Rest of the world

4 Which device do you mostly use to access the *Busuu* app? (Please select one)

Smartphone (Galaxy, iPhone or similar)
Tablet (iPad, Kindle Fire, Samsung or similar)
Smartwatch (Apple Watch or similar)

5 How long have you been using the *Busuu* app?

Less than a month
Between 1 – 6 months
Between 7 – 12 months
Over a year

6 How often do you use the *Busuu* app?

Several times a day
Every day
Several times a week
About once a week
Less frequently than once a week

7 How long do you normally spend using the *Busuu* app at a time?

Less than 5 minutes
Around 5 minutes
Around 10 minutes
Around 15 minutes
Between 16 and 30 minutes
Over 30 minutes

8 How do you use the *Busuu* app? (Please select one only)

Mostly in planned learning sessions (e.g. routine evening sessions)
Mostly informally, as when and where the opportunity or need arises

9 How many languages are you learning / practising with the *Busuu* app?

1
2
3
More than 3

10 What language are you learning with *Busuu*? If you're learning more than 1, please select the main one you are focusing on at the moment

Chinese
English
French
German
Italian
Japanese
Polish
Portuguese
Russian
Spanish
Turkish

11 How would you describe your level in that language?

Beginner (A1)
Elementary (A2)
Intermediate (B1)
Upper intermediate (B2)

Advanced (C1)
Nearly fluent / fluent (C2)

12 Why are you learning this language? (Select all that apply)

Personal interest
Relevant to my career aspiration or profession
Relevant to my current studies
I want to study / live overseas
I want to use the language when I travel
I want to use the language to communicate with family/friends
Other

13 Do you currently live in a country / area where the language you're learning is spo-ken?

Yes
No

14 As well as using the *Busuu* app, what else do you do to learn the language?

I'm registered on a course to learn this language at school / college / university / private tuition / conversation class

I'm not registered on a course but I use additional resources independently

The *Busuu* app is the only resource I use to learn the language

If you use additional resources independently, which ones are they? (Select all that ap-ply)
Books / eBooks
CDs / mp3s / podcasts
DVDs / online video
Websites
Other apps
Other

15 What other apps do you use to learn / practise languages? Select all that apply

None
Duolingo
Babbel
Rosetta Stone
Speakeasy
Other self-study Language Learning Apps
Language partner apps (e,g. Tandem, HelloTalk)
Flashcard apps (e.g. Quizlet, Memrise, Educards)
Dictionary apps
Translation apps
News apps in the language I'm learning

Twitter
Other (please specify)

16 What features do you like BEST in the *Busuu* app exercises? (Select up to 3 answers)

Vocabulary practice
Grammar practice
Reading practice
Writing practice
Listening practice
Translation practice
Feedback on your writing from other members of the *Busuu* community
Correcting other members' writing in your own language
Other (please specify)

17 What features do you like LEAST in the *Busuu* app exercises? (Select up to 3 answers)

Vocabulary practice
Grammar practice
Reading practice
Writing practice
Listening practice
Translation practice
Feedback on your writing from other members of the *Busuu* community
Correcting other members' writing in your own language
Other (please specify)

18 What do you think of the automated feedback you get about your performance whilst using the activities in the *Busuu* app (e.g. when an answer goes red if you make an er-ror)?

Very good
Good
OK
Not very good
Very bad
I don't get any feedback

19 Do you post your writing exercises for comment by other users?

Yes
No

Why?

If "Yes", what do you think of the feedback you get from other users?

Very good

Good
OK
Not very good
Very bad
The quality varies a lot
I don't get any feedback

20 Do you provide corrections for other users?

Yes
No

21 Do you use the My Vocabulary tool to store words or phrases you want to go back to?

Yes
No

If "Yes", do you actually use My Vocabulary as a revision tool?

Very often
Often
Occasionally
Rarely
Never

22 What more would you like to get from the *Busuu* app? (select all that apply)

More grammar explanations
More grammar exercises
More reading practice
More writing practice
More listening practice
More translation practice
More written interaction with native speakers
Speaking practice
Pronunciation explanations
Pronunciation exercises
Placement test
Spoken interaction with native speakers
Small group classes with professional teachers
One to one classes with professional teachers
Other (please specify)

23 What expectations did you have of the *Busuu* app when you downloaded it? (select all that apply)

I would improve my writing in the language
I would improve my reading in the language
I would improve my listening skills in the language

I would improve my speaking skills in the language
I would improve my translation skills in the language
I would improve my grammar in the language
I would improve my vocabulary in the language
I would be fluent in the language
I would meet people to practice the language with
I had no expectations

Has the *Busuu* app met your expectations?

Better than expected
As expected
Worse than expected

24 To what extent do you agree with the following statement: “Using the *Busuu* app has helped me improve my knowledge of the language I’m learning”

Strongly agree
Agree
Neither agree nor disagree
Disagree
Strongly disagree

25 Which areas do you think you’ve improved thanks to using the *Busuu* app? (select all that apply)

Grammar
Vocabulary
Writing
Reading
Speaking
Listening
Pronunciation
Translation
None

26 Which area do you think you’ve improved MOST thanks to using the *Busuu* app? (se-lect one only)

Grammar
Vocabulary
Writing
Reading
Speaking
Listening
Pronunciation
Translation
None

27 Please rate the overall quality of the *Busuu* app

Very good
Good
OK
Not so good
Very bad

28 Do you pay for premium membership?

Yes
No
I don’t know

If Yes, why?
Good value for money
Access to additional content
Access to support
It motivates me to keep using it since I’m paying for it
Other

If No, why?
I think language learning apps should be free
Too expensive
I don’t have a way of paying
I worry about the safety of online payments
I was not aware of this
Other

29 Please share any other thoughts you have about learning with the *Busuu* app.

30 If *Busuu* offered the possibility of taking some form of assessment leading to a certification in the language you study, would you be interested? (Please note that your answers will NOT be used to target any promotional content regardless of what you reply).

Yes
Yes, but only if it was free.
No

Thank you very much for taking part in this survey.

Appendix 2. One-way ANOVA with eta-squared effect sizes

Items		Sum of Squares	df	Mean Square	F	Sig.	η^2
Nationality	Between Groups	43.304	5	8.661	36.587	.000	.000
	Within Groups	920.128	3887	.237			
	Total	963.432	3892				
1. Are you male/female/identify as neither?	Between Groups	6.877	5	1.375	5.128	.000	.008
	Within Groups	1038.819	3873	.268			
	Total	1045.696	3878				
2. How old are you?	Between Groups	606.575	5	121.315	54.175	.000	.006
	Within Groups	8679.668	3876	2.239			
	Total	9286.243	3881				
4. Which device do you use to access the Busuu app?	Between Groups	14.729	5	2.946	11.191	.000	.003
	Within Groups	953.689	3623	.263			
	Total	968.418	3628				
7. How long do you normally spend using the Busuu app?	Between Groups	390.899	5	78.180	40.358	.000	**.030**
	Within Groups	7473.486	3858	1.937			
	Total	7864.385	3863				
8. How do you use the Busuu app?	Between Groups	61.975	5	12.395	60.505	.000	**.021**
	Within Groups	777.850	3797	.205			
	Total	839.824	3802				
9. How many languages are you learning with the Busuu app?	Between Groups	64.217	5	12.843	29.309	.000	.009
	Within Groups	1679.640	3833	.438			
	Total	1743.857	3838				
11. How would you describe your level in your main target language?	Between Groups	184.492	5	36.898	34.235	.000	**.014**
	Within Groups	4126.868	3829	1.078			
	Total	4311.360	3834				
13. Do you currently live in an area where your main target language is spoken?	Between Groups	14.998	5	3.000	19.283	.000	.007
	Within Groups	592.356	3808	.156			
	Total	607.354	3813				
14. As well as the Busuu app, what else do you do to learn the language?	Between Groups	5.237	5	1.047	1.804	.109	.002
	Within Groups	2194.381	3779	.581			
	Total	2199.618	3784				
18. What do you think of the automated feedback you receive about your performance while using Busuu?	Between Groups	61.279	5	12.256	7.016	.000	.008
	Within Groups	6438.950	3686	1.747			
	Total	6500.229	3691				
19. Do you post writing exercises for comment by other users?	Between Groups	47.532	5	9.506	41.471	.000	**.016**
	Within Groups	845.406	3688	.229			
	Total	892.938	3693				
23. a. Has the Busuu app met your expectations?	Between Groups	28.732	5	5.746	17.841	.000	**.017**
	Within Groups	1094.783	3399	.322			
	Total	1123.514	3404				
24. "Using the Busuu app has helped me improve my knowledge of the target language?"	Between Groups	63.690	5	12.738	26.056	.000	**.030**
	Within Groups	1703.750	3485	.489			
	Total	1767.440	3490				
27. Please rate the overall quality of the Busuu app	Between Groups	30.783	5	6.157	11.831	.000	**.016**
	Within Groups	1827.045	3511	.520			
	Total	1857.828	3516				
28. Do you pay for premium membership?	Between Groups	35.001	5	7.000	26.849	.000	**.035**
	Within Groups	921.902	3536	.261			
	Total	956.903	3541				

Section III: Twitter as a language teaching and learning tool

Publication 7:

Rosell-Aguilar, F. (2018). Twitter as a formal and informal language learning tool: from potential to evidence. In F. Rosell-Aguilar, F., T. Beaven, & M. Fuertes-Gutierrez (2018*). Innovative language teaching and learning at university: integrating informal learning into formal language education*, (pp. 99-106).

Abstract

Twitter can be used as a language learning tool and this potential has been identified by a number of scholars. This chapter presents an overview of the identified potential of Twitter as a language learning tool and presents an overview of different studies carried out to provide evidence of language learning using Twitter in different contexts. It concludes that, although there is evidence of language acquisition in formal contexts, more research is needed to inform how Twitter is used in informal settings.

1 Introduction

Twitter is a multi-platform Social Networking Site (SNS), available to users from a range of devices, mobile or not. Users can post short messages (tweets) made up of up to 280 characters (the limit was 140 characters until November 2017). Twitter supports sharing photographs and video (including live streaming), hyperlinks to online resources, and creating short polls. Since Twitter was launched in 2006, the microblogging tool has gone from being a little-known service to a world-wide phenomenon with massive impact on news, politics, business, entertainment, sports and education among many other fields. By 2017, Twitter had 330 million monthly active users, with 80% of users accessing the tool from mobile devices (Twitter, 2017). Users utilise hashtags to make the topics of their tweets more visible and searchable, and Twitter lists the most popular issues being discussed as trending topics, with geographical variations to reflect different issues around the world.

Due to affordances such as hosting media-rich resources, and private and public communication, Twitter, like other SNS such as Facebook, can be used as a medium for both formal and informal learning. In this chapter, formal learning is defined as learning directed by an educator in a formal setting, such as a school or university, and informal learning as learning that is self-directed by the learner, who takes charge of the initiatives and activities they undertake towards learning (also referred to as self-directed learning and autonomous learning). It has been acknowledged that “informal education plays a key role for language learning” (European Commission, 2012, p.16),

and this chapter will evaluate the potential of Twitter for language learning and the evidence found so far to support whether that potential is being realised.

2 Twitter and language learning

In the early days of Twitter, English was the dominant language used in this platform. In 2006, 98% of tweets were written in English (GNIP, 2014). Seven years later, although still the most used language on Twitter, the proportion of tweets in English had fallen to 51%, followed by Japanese (14.8%), Spanish (13.4%), Portuguese (5.1%), Indonesian (3.2%), Arabic (3.2%), French (2.4%), Turkish (1.8%), Russian (1.3%) and Korean (1.1%) (Ibid). Twitter currently supports 40 different languages (Twitter, 2017) and also offers a translation tool that identifies the language of the tweet and translates it to the default language of the user's account.

The 140-character limit that characterized tweets for its first decade was seen as both an advantage and hindrance. While some detractors felt that it stopped the natural flow of language and could lead to the use of bad grammar (Grosseck & Holotescu, 2008), other authors claimed that the limit encouraged more precise thinking, editing and synthesising of language (Dunlap & Lowenthal, 2009, Plutino, 2017). The language used to tweet is determinant of how restrictive the character limit is: whereas in some languages this limited the message to just a few words, in other languages such as Chinese or Japanese 140 characters allow for much more content to be expressed, most likely the reason why the limit remains at 140 characters for languages such as Chinese, Japanese and Korean even after November 2017.

Many authors have highlighted the potential of Twitter in particular as a tool for language learning (Dickens, 2008; Borau, Ullrich, Feng & Shen, 2009; Harmandaglou, 2012; Newgarden, 2009). Craig (2012) differentiated between linguistic benefits (noticing vocabulary, expressions, idioms and grammar), cultural benefits (access to native speakers and insight into their routines, opinions, media and general interests), and social benefits (extending learning outside the classroom, social presence and distribution). Borau et al (2009) proposed that on Twitter language learners can access exposure to the target language and also learn to express their thoughts in the target

language. In contrast, Newgarden (2009) focused instead on engagement and participation in communities of language users.

Other benefits for language learning include opportunities to learn about current affairs, politics or culture (Reinhardt, Wheeler & Ebner, 2012), engaging in language play (Hattem, 2014), and posting homework and brief questions to respond to, intercultural information and exchanges (Lee & Markey, 2014). In addition, Twitter can help raise awareness of popular culture, and be used to share experiences of visiting a target language area (Plutino, 2017).

Figure 1 presents an overview of the different potential uses of Twitter as a language learning tool, some of which overlap. Although Twitter is primarily a written medium, the ability to livestream video and link to audio and video resources (self-produced or content from others), means that interaction is not limited to text.

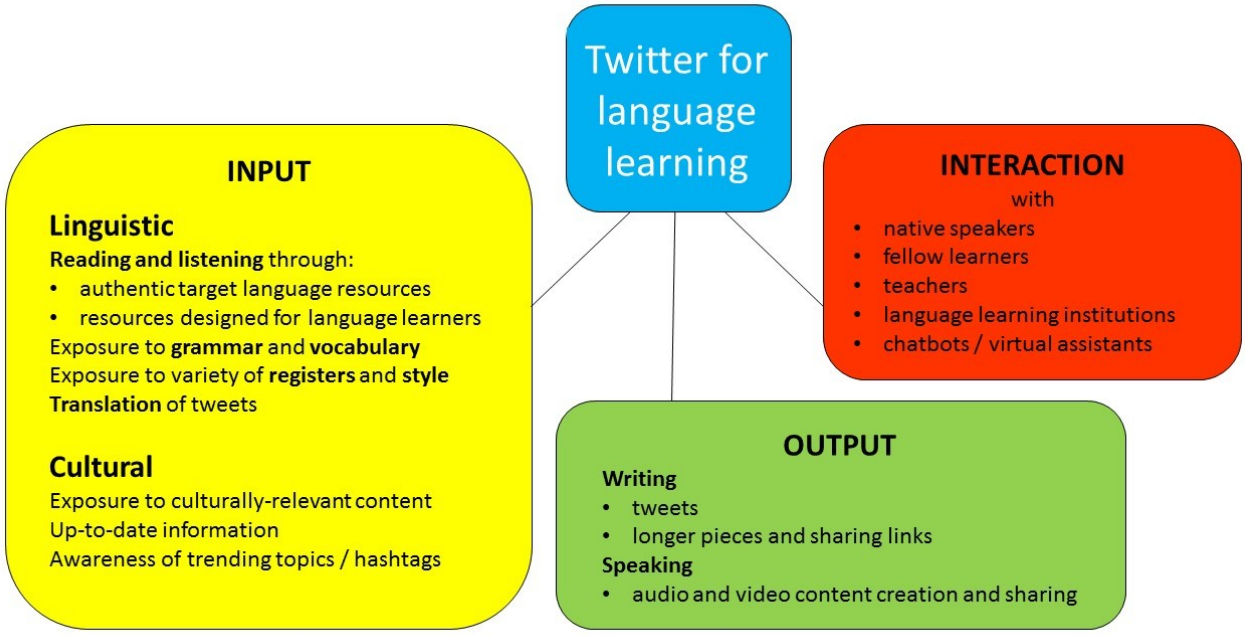

Figure 1: Potential uses of Twitter as a language learning tool.

The types of uses presented in Figure 1 can be part of teacher-directed activity in a formal learning environment, in or outside the classroom, or can be undertaken by learners in an informal manner as self-directed activity. Doing the latter allows language learning activity to be learner-centred, as they can choose who to follow and what topics to focus on depending on their own interests.

3 Evidence of engagement and learning

A number of studies have looked into the use of Twitter for a variety of areas of language learning. Some of the research has focused on interaction among students and also with native speakers: Ullrich et al. (2008) carried out one of the earliest studies into the use of Twitter for language learning, with very positive results: 94% of their students, based in China, believed that their English had improved with the help of Twitter. The students communicated with each other in English through Twitter and half of them also communicated with native speakers. Similar results were found by Kim, Park and Baek (2011): from their study of 45 Korean schoolchildren learning English as a Foreign Language, they concluded that the use of Twitter had stimulated their mixed-ability participants to produce output in the target language and engage in social interaction with fellow students as well as native speakers. Similarly, Antenos-Conforti (2009) analysed the tweets that 22 of her students of intermediate Italian tweeted, as well as the data from a survey into their experience of using Twitter. She concluded that the introduction of Twitter into her course helped the students develop a sense of community and encouraged participation, creating a virtual extension of his classroom. In contrast, Craig (2012) used Twitter over three semesters in 2010-11 for an advanced EFL writing class in Korea. Students were required to tweet daily and provide feedback on others' writing. Although students' knowledge of the tool improved, their engagement was very teacher-directed and the results disappointing; he eventually abandoned its use in class.

Jiménez-Muñoz (2014) looked into the use of Twitter to promote communication among students and also among tutor – student, engage students in target language use and get involved in more sophisticated use of the language as well as error correction. He found an increase in both the quantity and quality of interactions in the target language among his students. In one of the few research projects focusing on the use of Twitter to teach pronunciation, Mompean and Fouz-González (2016) set up a series of tweets for their participants (16 Spanish EFL students). The tweets highlighted commonly-occurring errors in pronunciation for Spanish speakers: silent letters, unusual graphemes-phoneme correspondences, and misplaced lexical stress. Correct pronunciation was highlighted either within the text of the tweets or with links

to audio and video resources. The researchers found high levels of interaction with the tweets. All participants who took part in both pre- and post- pronunciation tests showed significant improvement. Other attempts to encourage learners to improve their pronunciation using Twitter include the project by Plutino (2017), who encouraged her students to use the speech-to-text feature on their mobile phones to compose tweets in Italian. Although using this method slowed down the process of tweeting, 75% of the participants in her study found the process helpful to self-assess their performance and identify pronunciation and accuracy errors.

Other Twitter studies have focused on intercultural exchanges as well as language learning. Lomicka and Lord (2012) carried out a study with 13 US students of French and 12 French students of English using Twitter to build community and language practice outside class time. Their data suggested that the participants quickly formed a collaborative community that enabled them to learn, share and reflect. The students reported that they had learnt more about French culture than in previous courses, gained confidence, improved their reading skills and learnt from each other's tweets. They also indicated that they were more likely to use Twitter again for learning. Similarly, Lee and Markey (2014) carried out an intercultural exchange project between 10 students of advanced Spanish in the USA and 18 students of advanced English in Spain utilising a number of Web 2.0 tools. Twitter was used to make connections among participants, establish good rapport and build group dynamics, exchange personal interests, academic work and cultural perspectives, and brainstorm ideas and make arrangements for assignments. The researchers found very positive perceptions of Twitter for these purposes and in particular for building community and interpersonal relationships, but some students felt limited by the 140-character length and message order, and one student was very reluctant to use Twitter.

Whilst the research studies presented have found some evidence of engagement with language learning activity and increases in confidence, community development, and language acquisition, most research into the use of Twitter for language learning has been based on activities that were teacher-directed. In many cases participation was compulsory and in some of the studies learners had to create Twitter accounts for the purposes of the research. Whilst the data they studies present remains of interest, the

evidence presented does not capture the more natural type of activities learners engage in of their own accord. Evidence of self-directed interaction and engagement with language learners and resources can often be found in the Twitter accounts of language learners, many of whom engage with language learning accounts such as those from language institutions such as The British Council, Alliance Française, or the Goethe Institute, for example. Some learners tweet in their target language and share news from the areas where their target language is spoken, as well as recommendations for resources and language learning tips. However, there is a dearth of research into informal language learning through Twitter, and that is an area worthy of further research.

4 Conclusion

The recent doubling of the character count from 140 to 280 is likely to have an effect on the way users express themselves. It may reduce the number of acronyms and abbreviations used as well as the number of instances of 'bad' grammar (skipping articles or prepositions, for example). It may also lead to more reflection and less concise posts, thus addressing the concerns some researchers had expressed regarding the 140-character limit (Grosseck & Holotescu 2008). The changes to the way Twitter users express themselves after the move from 140 to 280 characters will be an interesting area for further investigation.

Although this chapter has focused on the learner experience of using Twitter for language learning purposes, it is worth mentioning that language teachers also engage in the sharing of resources and experiences through hashtags such as #Langchat and #MFLtwitterati, which are examples of teachers seeking and supporting each other for continuous professional development through Twitter.

Publication 8:

Rosell-Aguilar, F. (2018). Twitter: A Professional Development and Community of Practice Tool for Teachers. *Journal of Interactive Media in Education*, 2018(1).

Abstract

This article shows how a group of language teachers use Twitter as a tool for continuous professional development through the #MFLtwitterati hashtag. Based on data collected through a survey (n=116) and interviews (n=11), it describes how this collective of teachers use the hashtag and evaluates the impact of their Twitter network on their teaching practices. The results show that most users try the suggestions and ideas that they find on this network, which have a positive impact on their teaching. Finally, the article assesses whether the hashtag users can be described as a community of practice.

1 Introduction

As many schools around the globe suffer cuts to their funding for Continuous Professional Development (CPD), some teachers have taken to Twitter as a replacement for formal learning opportunities through conversations, sharing ideas and resources (Greenhalg & Koehler, 2017). Twitter is a microblogging tool where users can post messages (tweets) of up to 280 characters (the limit was 140 up to November 2017) as well as links, photos and videos, polls and live video streaming. It also has a feature for direct messaging to individuals or groups. Twitter is multiplatform and can be used from a variety of connected devices (computers, smartphones, tablets). In 2017 Twitter had over one billion registered accounts, of which 330 million were active. It is estimated that 500 million tweets are sent every day and 80% of users access Twitter via their mobile device, which supports considering engagement with Twitter as a mobile activity for most users (all data source: Twitter, 2017). Hashtags are an essential part of Twitter. They are words or combinations of words preceded by the # sign to indicate the topic of the tweet. When a hashtag appears in a large number of tweets, it ‘trends’ as a popular topic; that is, it features in the chart of most talked-about issues. Hashtags are also used for Twitter Chats, where users utilise a hashtag for a pre-arranged conversation on a specific topic.

Although dismissed by some by some as a medium for “vacuous, inane and limited postings” (Wright, 2010, p. 259), Twitter has become a social media tool where

meaningful and engaged conversations can take place. Over 4.2 million daily tweets are reported to be from educators (Hill, 2014), who share their work, ideas and thoughts through Twitter. Some educators (teachers, trainers, and experts on their fields) have tens of thousands of followers. Whilst the number of followers is not necessarily an indicator of content quality in their tweets, it provides credibility and conveys to prospective followers that a high number of people wish to know what these educators have to say or curate.

2 Literature review

2.1 Twitter for Education

Back in 2010, the results from a report based on 2,000 responses from US higher education professionals (professors, online instructors, academic leaders, and individuals) showed that more than half the respondents thought that Twitter had no place in academia or potential use in higher education (Al-Khalifa, 2010). Nowadays there is general agreement that Twitter has the potential to deliver informal learning beyond the classroom (Ebner et al., 2010; Gao et al., 2012; Tang & Hew, 2017). Among the potential uses of Twitter that were highlighted in the early research into its use for education are: developing classroom community, collaborative writing and topic discussion, gauging responses and opinion from readers, collaboration, project management, exploring language and developing a Professional Learning Network (PLN) (Grosseck & Holotescu, 2008); support for informal learning and connection with a professional community of practice, as well as the possibility of engaging with students in a timely manner (Dunlap & Lowenthal, 2009); and connectivity and immediacy among users (Stevens, 2008).

The opportunities that Twitter provides to build interaction and collaboration between students and / or students and instructors are often mentioned in the literature (Dunlap & Lowenthal, 2009; Ebner et al., 2010; Junco et al., 2013), as is the enhancement of social presence (McFedries, 2007; Dunlap & Lowenthal, 2009). Other authors have highlighted the promotion of cultural authenticity and the fact that student reactions to its use in and out of class time have been mostly enthusiastic (Antenos-Conforti, 2009;

Lomicka & Lord, 2012), although this has not always been the case (Craig 2012). Some drawbacks identified include the possibility of Twitter use being too distracting, time-consuming and addictive, as well as issues around privacy (Grosseck & Holotescu, 2008; Dhir et al., 2013). The 140-character limit that operated until November 2017 (and still applies to languages such as Chinese, Japanese and Korean) was regularly mentioned as well: some authors were concerned about how this limit restricted the ability to express oneself (Luo, Sickel & Cheng, 2017), whereas others stated that the character limit lowered users' time requirements and facilitated more frequent postings (Java et al., 2007). In contrast, Dunlap and Lowenthal (2009) thought that the character limit encouraged more precise thinking and editing of the language used.

One common role among educators on Twitter is that of curators of content, both their own and that of others. Weisberger and Butler (2012) list the following steps to becoming an educator curator: finding content, selecting (depending on quality, relevance and originality), editorialising (by contextualizing, summarizing, and/or adding your own perspective), arranging, creating, sharing, engaging with others, and tracking that engagement. Not all teachers on Twitter follow these steps in their practice: some restrict their activity to following others and not contributing any content of their own. This is still a valid activity that allows them access to the content and ideas being shared. The content that teachers choose to curate is what makes them stand out from others on Twitter and therefore gain more followers.

2.2 Twitter as a learning environment for teachers.

As teachers turn to online environments for their own independent CPD, as opposed to that provided by the institutions they work for, it is important to evaluate the value this provides as "there is a paucity of research exploring professional development on social media across different contexts" (Veletsianos, 2017, p. 285). Teachers appreciate the flexibility, lack of cost, accessibility and relevance of such professional development, although there are some disadvantages such as information overload or feeling intimidated or overwhelmed (Hill, 2014; Carpenter, Tur & Marín, 2017; Luo, Sickel & Cheng, 2017). This phenomenon has been reflected in the literature, with

many authors concluding that Twitter is an effective tool for professional development (Carpenter & Krutka, 2014; Lord & Lomicka, 2014; Visser et al. 2014; Carpenter, Tur & Marín, 2016; Trust et al., 2016; Greenhalg & Koehler, 2017; Veletsianos, 2017; Luo, Sickel & Cheng, 2017; Rehm & Notten, 2017). The Visser et al. (2014) study analysed the responses of 324 school teachers who used Twitter. Some reported that the professional activity that they carried out on Twitter had an impact on their classroom practice as well as on the development of their own professional knowledge. Other participants reported developing a network with fellow teachers through Twitter. Similar results were found by Carpenter and Krutka (2014), who also reported on how ideas and resources that teachers found through Twitter had had an impact on their classroom practice and the relationships they developed with other teachers helped them to combat isolation and find a positive community. These findings also match the research carried out by Wesely (2013) with language teachers. Luo, Sickel and Cheng (2017) found very improved perceptions of Twitter for professional development; their participants found useful sources of information and were inspired by the connection to other educators. Similarly, Carpenter, Tur and Marín (2016) compared the experiences of two groups of student teachers in the USA and Spain and, although there were differences among the groups (possibly because far more tweets are posted in English than in Spanish), their participants were positive about the educational purposes of Twitter and the connections with other professionals it enabled. These latter two studies introduced the use of Twitter among the participant student teachers, so their participants did not come together naturally as was the case of other studies based around hashtags.

Some authors have highlighted the value of social media (and Twitter in particular) for connecting new or in-training teachers with peers and with more experienced ones to engage in professional conversations (Risser, 2013; Beaudin & Sivak, 2015; Luo, Sickel & Cheng, 2017). Wright (2010), carried out a study where eight teacher education students placed in schools in different locations were able to support one another effectively and discuss pedagogical issues. Some respondents to Carpenter and Krutka's (2014) survey of 755 teachers highlighted the access that Twitter provides to the perspectives and experience of veteran teachers. Pieterse and Peled (2014) set up a Twitter practice where teachers in training shared experiences with

fellow students and mentors with very positive results, as did Lord and Lomicka (2014).

A PLN for teachers is developed on Twitter by following other teachers, checking who else follows them or whose tweets they retweet, and selecting similar people to follow. Trust, Krutka, and Carpenter (2016) define PLNs as “uniquely personalized, complex systems of interactions consisting of people, resources, and digital tools that support ongoing learning and professional growth” (p. 28). The shared Twitter hashtags become digital “affinity spaces” (Gee, 2004) that teachers can use “to engage in conversation, mentoring, and resource sharing” (Trust et al. 2016 p. 18). A Twitter PLN is linked to the concept of social presence as online representations of the self, which can be a key factor in facilitating collaborative learning and developing online communities (Lomicka & Lord, 2012) based on the assumption that “social presence serves as the basis for building successful communities of enquiry and other dimensions of cognitive and teaching presence” (p. 51). Ferguson (2010) stated that Twitter can help create “a community built on communication and collaboration dedicated to making learning and education the best they can be” (p. 13), therefore, members of a Twitter PLN may become a Community of Practice (CoP), defined as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger et al. 2002, p. 4). Wright (2010) found that teachers in training valued contact with the community, mitigating feelings of isolation. In their study of language teachers in training and their contact with more experienced teachers through Twitter, Lord and Lomicka (2014) found evidence of engagement in joint activity and discussions: they concluded that Twitter is “a tool that is capable of allowing participants to create a CoP and to build social presence” (p. 209). Pieterse and Peled (2014) arrived at very similar conclusions in their study of novice teachers using Twitter for professional guidance, social support and personal empowerment.

An issue that is linked to CPD and CoP practices on Twitter is that of confidentiality and public profiles. As school leaders find their staff on Twitter, some institutions are choosing to regulate and / or monitor their activity. However, Visser et al. (2014) found that the majority of teachers whose schools placed restrictions to using Twitter continue to use it, albeit using their mobile phones to bypass school network

restrictions and administrators. Educational technology blogger Andrew Campbell argues that the

> influx of school leaders onto edutwitter is changing how teachers are using the space. (...) Teachers are now under greater scrutiny for their online activities, and are increasingly asked to ensure their tweets are in line with what their school leaders approve (Campbell, 2015, para 5).

As a consequence, Campbell notes that "increasing numbers of teachers choose to tweet anonymously" (ibid) and this may drive teachers to protect their tweets by locking their accounts so that only people they choose can read them, or choose to exchange messages through private direct messages, therefore losing the benefits for other members of the community.

2.3 Teachers coming together through a hashtag: the #MFLtwitterati

Some researchers have based their studies on teacher use of hashtags for professional and community development (Rehm & Notter, 2016; Gao & Li, 2017; Greenhalg & Koehler, 2017; Veletsianos, 2017). Greenhalg and Koehler, (2017) highlight the 'just in time' nature of some hashtags and how they can help deliver resources and ideas for teachers dealing with a current situation (e.g. addressing a terrorist attack with their students and colleagues) while Veletsianos considers hashtags a learning environment that can provide exciting opportunities for teaching and learning, pointing out that the use and effectiveness of a hashtag is "partly determined by factors other than its affordances and design – by users' needs and desires, as well as the broader social, cultural, economic and political environment" (2017, p. 285). Wesely (2013) carried out a twitter-based ethnography (netnography) study of professional development for language teachers around the #langchat hashtag. She followed the hashtag as a member and interviewed 9 participants. She mapped the data collected to the different characteristics of communities of practice (domain, community and practice) and concluded that the community formed around the hashtag fitted these characteristics.

Another example of language teachers coming together through a hashtag is the #MFLtwitterati. The #MFLtwitterati hashtag was originated by Joe Dale (@joedale), who has interests in the use of technologies for language learning. He created a list of like-minded Twitter users, which he named the MFL (Modern Foreign Languages) Twitterati. The list members soon started using the name as a hashtag for their tweets, and it has now became a well-known Twitter hashtag used by innovative language teaching professionals, mostly based in the UK but also from further afield. One disadvantage of the hashtag is that it is 14 characters long, which used 10% of the available characters in a 140-character tweet. In the 12 months between 4th July 2014 and 3rd July 2015, 5652 tweets were posted using the #MFLtwitterati hashtag (data gathered using *Humabird Scriptscrape*, a prototype tool to collect Twitter data).

Users of the #MFLtwitterati hashtag share thoughts, ideas and practices, resources, joys and frustrations alike. The list currently has over 2,000 members, and the hashtag is used by many more. Joe Dale reflects: “Over time, the group has developed a strong ethos of sharing innovative classroom practice, encouraging each other to experiment and feed back their findings for further discussion and reflection.” (Williams 2015, section 6). One way the #MFLtwitterati share resources is through Dropbox. Users upload materials, classified by language, for others to reuse or adapt, including plans, images and PowerPoint presentations. This has proven very popular with teachers and as of June 2015 over 13,000 items were stored in the different Dropboxes (2109 in the generic Dropbox and 3,886, 6,196 and 1,299 in the respective Spanish, French and German boxes).

In an effort to understand whether the tweeting activity had an effect on classroom practice, Dale (2013) carried out an informal Twitter survey, asking hashtag users to describe their opinions in a single tweet. From the replies he received, he concluded that the #MFLtwitterati feel they are part of a large group of like-minded colleagues where they can share their classroom experiences and be supported when experimenting with new ideas; can reflect on their own practice through informal discussion with others and feel they have become better teachers as a result, always open to new ways to improve; find it easier to keep up to date with the latest resources, national news, government documents, OFSTED initiatives, links to useful blog posts, etc.; are delivering more engaging and effective lessons by trying out new strategies

which in turn are motivating their pupils, improving attainment and encouraging them to produce more creative outcomes; and have greatly improved their own and their students' skills and confidence in different technologies, integrating them into their lessons and enhancing learning (Dale, 2013, para 8). The research study this article reports on aims to take this informal data and make a more formal attempt to capture the current practice of #MFLtwitterati members and users.

3 Research Questions

More research is needed to understand how people involved in informal learning communities learn from one another (Carpenter, Tur & Marín, 2016; Rehm & Notten, 2016), the reasons why people participate in Twitter online communities and what they believe they gain from participation (Gao & Li, 2017) and the use of hashtags in teacher development (Greenhalg & Koehler, 2017; Veletsianos, 2017), language teachers in particular (Wesely, 2013). The research questions the study aimed to answer were:

1 Who are the #MFLtwitterati? This involves profiling the participants: sex, where they live, where they teach, and what subjects they teach

2 Do the practices of the #MFLtwitterati provide evidence that Twitter engagement can contribute to Continuous Professional Development? The evidence for this is based on the participants' awareness of the hashtag, use of the hashtag, use of resources, and perception of how activity around the hashtag affects their professional activity.

3 Can the #MFLtwitterati be described as a community of practice? This evaluation is based on whether the practices of the #MFLtwitterati fit with the three descriptors defined by Wenger (1998): mutual engagement, joint enterprise, and shared repertoire.

The #MFLtwitterati hashtag was chosen for this study as it is a very active hashtag with a specific audience. Other language learning hashtags such as #LanguageLearning or #Langchat exist, but whereas these two are used by teachers

and learners alike, #MFLtwitterati tends to be used almost exclusively by teachers and not learners.

Twitter is a very popular tool among language learners and teachers as it provides exposure to authentic language via the accounts of individuals, media outlets and institutions who tweet in the target language. It is also a way to practice language skills and access resources such as text, audio and video in the target language.

Although some research has been carried out into the use of Twitter among language teachers (Lord & Lomicka 2014), previous studies have mostly been based on groups formed when coming together in a physical space or for a specific purpose, such as a class. This meant that the researchers knew the profile of the participants in the research. The research this article reports on is varies from that approach and is similar to that of Wesely (2013), as it is based on a group that has formed organically, just by being users or followers of a hashtag. This means that the approach is more ethnographic than previous research, as it is based on a natural community. However, it also means that there is no user profile available, which is why the first research question profiles the users. Although some of the research described in section 2 made claims about CPD and CoPs, these were mostly observations rather than evidence based on empirical research designed to clarify what practices on Twitter demonstrate engagement with CPD and belonging to a CoP. This gap in the research is what questions two and three address.

4 Methods

A survey was set up using SurveyMonkey, the online survey tool. At the time the survey was carried out, current recommendations against its use in UK Higher Education research due to the location of its servers outside the EU had not been established. The survey contained 22 questions: 17 closed questions and five open-ended questions (see Appendix 1). The questions were designed to provide a profile of the users, their use of the hashtag and how belonging to this community had benefitted them. Given that the research revolves around the use of Twitter, it was decided that the link to the survey should only be distributed via Twitter using the #MFLtwitterati hashtag, and not through any other methods such as mailing lists. This

method of tweeting a link to a survey has been used in previous research on teacher Twitter practice (e.g. Carpenter & Krutka 2014; Visser et al.2014). Tweets with the link were sent by both the author and #MFLTwitterati creator Joe Dale in November 2014 (Figure 1), and 120 responses were received. Four of the respondents did not identify as language teachers, so they were removed from the data. The total number of responses is therefore n=116. Because of the exploratory nature of the research and the type of questions, which aimed to find out demographic information, practice, and beliefs, the analysis of the closed questions was restricted to descriptive statistics, carried out using SurveyMonkey's own data analysis tools. The data are available to view as an open resource (Rosell-Aguilar, 2017). To analyse the data from the open-ended questions, all responses were read once in order to gain a general picture of the data. Subsequently, all responses were read a second time to identify main themes and code the replies. The responses were then read a third time to ensure that the coding had been adhered to and ensure nothing had been missed following the thematic analysis process suggested by Braun and Clarke (2006).

Figure 1: Tweet by Joe Dale inviting #MFLTwitterati to take the survey.

In addition, follow-up interviews were conducted in June 2015 (see Appendix 2 for the list of questions). A tweet was sent with the #MFLtwitterati hashtag requesting participants (Figure 2). A total of 13 Twitter users agreed to take part, all of whom had taken part in the large quantitative survey. Of the 13 interviewees, one was removed from the analysis because he was not a language teacher. Another interviewee was removed as she was very new to Twitter and had only just heard about the hashtag, therefore n=11.

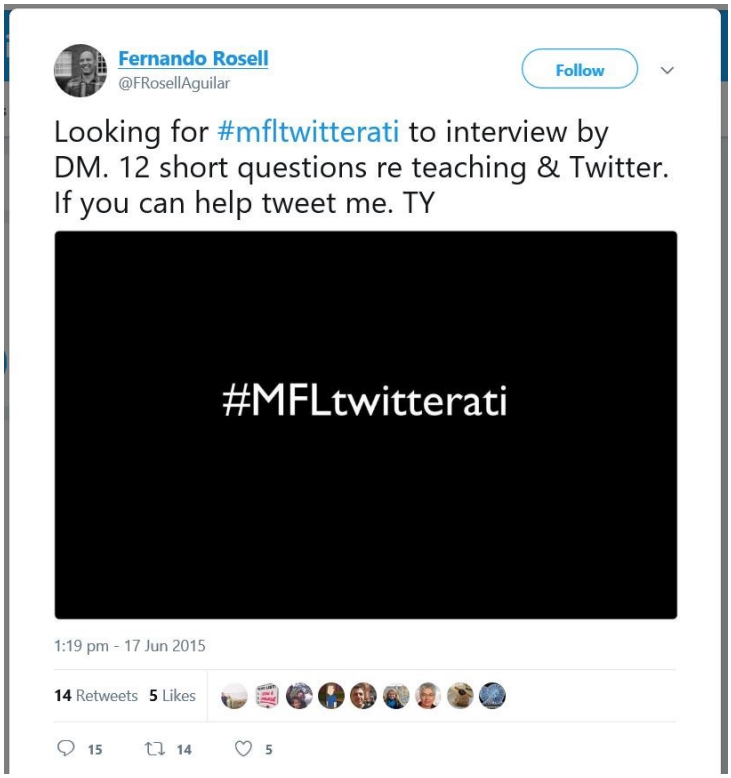

Figure 2: Tweet from the author requesting participants for follow-up interviews.

The interviews were conducted by Direct Messaging (DM), Twitter's own private messaging tool. This 'Twitter Direct Messaging interview protocol' follows the principles of email epistolary interviews online (Debenham, 2007) adapted to Twitter (Figure 3). The features of Epistolary interviews that Debenham finds positive are that they provide an immediate text-based record of the interview, are more convenient to arrange (without travel considerations or expenses) and do not require the interviewer or interviewees to be available at specific times. They also allow participants to read, digest and reflect on the questions if they wish. As is the case with email, the asynchronous nature of this method removes time zone differences when applied to Twitter, as participants can read and reply at a time that is convenient to them. The medium is ideal for research involving Twitter users, as they are familiar with the technology and accustomed to communicating through it. In addition, if the researcher is an active Twitter user, it is likely that their followers will have similar interests, which will lead to more Twitter users engaging with the research or at least retweeting the call for participants. Further advantages of this Twitter DM interview protocol include ease of scheduling and lack of need for personal information (such as names or email addresses) to be exchanged. The questions were written so that they would fit within the 140-character limit of DMs that applied at the time when the research was

undertaken (this has since changed and DMs no longer have a character limit). Participants were advised that they could take their time to think about their replies and that they could use more than one DM to respond to avoid the character length restriction. The content of the DMs was subsequently copied and pasted onto a spreadsheet for ease of analysis. Replies were coded and analysed thematically by interviewee and question. The research methods were approved by the Human Research Ethics Committee at the University where the author works and ethical guidelines for internet research (Markham & Buchanan, 2012) were followed. No information collected is available to the public and participants cannot be identified. Participants were self-selected and could withdraw from the survey or interview at any time. No names or contact details (except Twitter handles for interviewees) were collected.

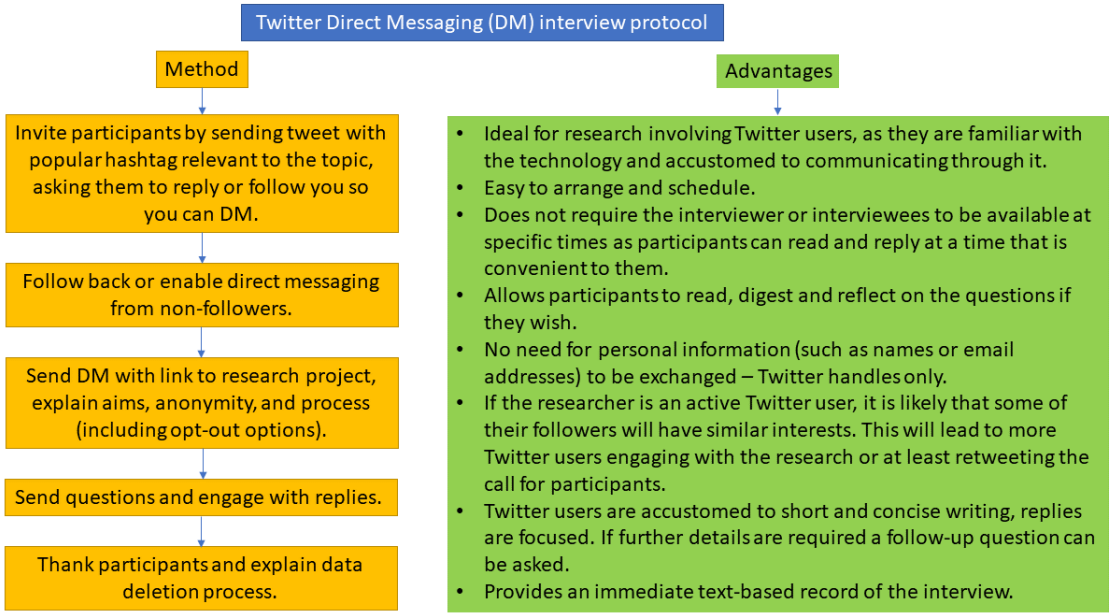

Figure 3: The Twitter Direct Messaging Interview Protocol.

5 Results

In this section the relevant results from the survey will be presented in the first two sections: user profile and practices and beliefs. A third section presents the results from the interview data.

5.1 User profile

The majority of survey respondents (86.6%) lived in the UK. Respondents from other geographical areas represented much smaller percentages (Ireland 3.6%, rest of Europe 4.4%, US/Canada 1.8%, Asia 1.8%, Africa 0.9% and Australia/New Zealand 0.9%). Most respondents were female (87.6%). All respondents were involved in language teaching: 89.5% at a school, 1.8% at a university, 6.1% independently, and a further 2.6% in “other” teaching situations. Respondents were asked to select all languages they taught, as many language teachers teach more than one language. These were mostly French (84.2% of participants), Spanish (58.7%) and German (42.1%). Other languages were English as a foreign language (10.5%) and Italian (4.4%).

5.2 Practices and beliefs

The responses to the survey are presented here under four categories as identified in the research questions: awareness of the hashtag, use of the hashtag, use of the Dropboxes, and perception of the #MFLtwitterati.

Awareness of the hashtag: the responses to the question about how long respondents had been aware of the #MFLtwitterati hashtag appear in Figure 4. The main reason respondents had become aware of the #MFLtwitterati was because they had noticed in tweets from others (51.4%), followed by personal recommendation (36.2%) and because they had read about it (12.4%).

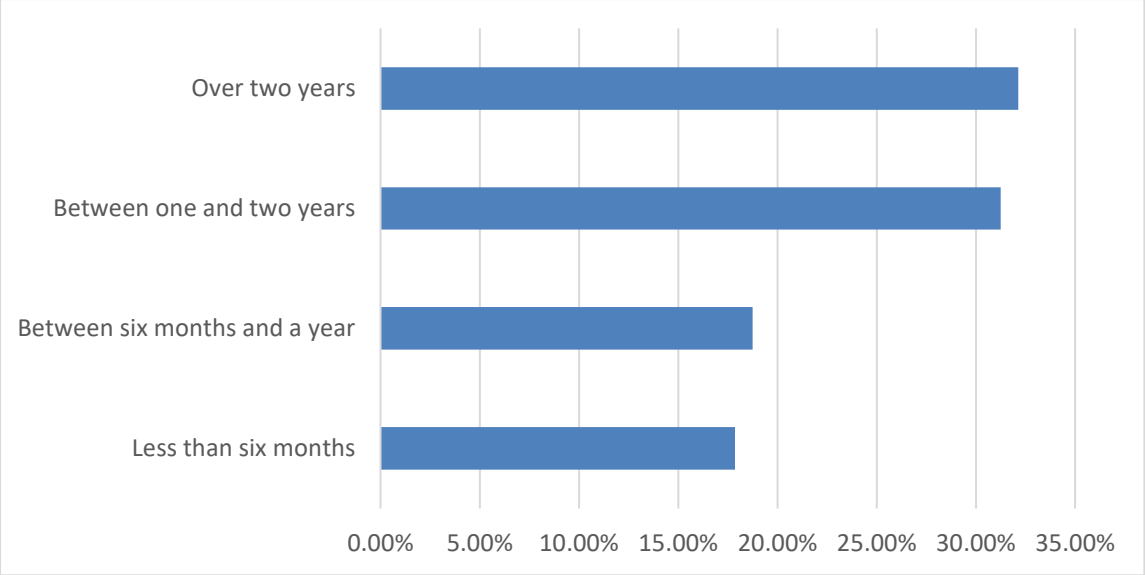

Figure 4: time respondents have been aware of the #MFLTwitteratti hashtag.

Use of the hashtag: 77.7% of respondents had used the hashtag in their tweets, whereas 22.3% had not. In response to an open question about their reasons for using or not using the hashtag, those who used it did so for a number of reasons. 84 responses were received. A frequency analysis of these showed that the word most used was “sharing”, with 30 instances from different respondents. “Ask/asking” questions, “advice” and “help” had a combined count of 40, and the concept of reaching an audience appeared 21 times. Other words which appeared multiple times were “ideas” (14 times), “resources” (10), “community” (5) and “information” (4). Among those respondents who had not used the hashtag in their tweets, eight were new to Twitter and a further seven explained that they did not tweet, they only used Twitter to follow others and read their contributions. Two respondents felt that they had nothing worth contributing, and two respondents worried about privacy issues as teachers. A final question about the use of the hashtag asked participants if they regularly checked the hashtag. Some 43.4% of respondents claimed that they did so “often” and a further 43.4% did it “occasionally”, with 9.7% choosing “rarely” and 3.6% who “never” checked it. It worth noting that it is not necessary to check the hashtag to access the tweets where it is used, as these will appear in the users’ timelines, albeit in a more serendipitous way.

Use of the #MFLtwitterati Dropboxes: some 66.4% of respondents were aware of the Dropboxes, whereas 33.6% were not. Access to the Dropboxes is not open and users

have to request access from a number of key holders. A total of 40 respondents (35%) downloaded resources stored in the Dropboxes. Of these, 20% used them often, 50% occasionally and 30% rarely. Fewer respondents added resources to the Dropboxes: some 74.6% had never added resources, 10.5% “rarely” did so, 12.3% did so “occasionally” and 2.6% added resources often.

Perception of the #MFLtwitterati: some 86.6% of respondents had recommended the hashtag to others. Using a list of descriptors that Dale (2013) gathered from his previous survey, participants were asked to select the three that they most agreed with. The results are presented in Figure 5.

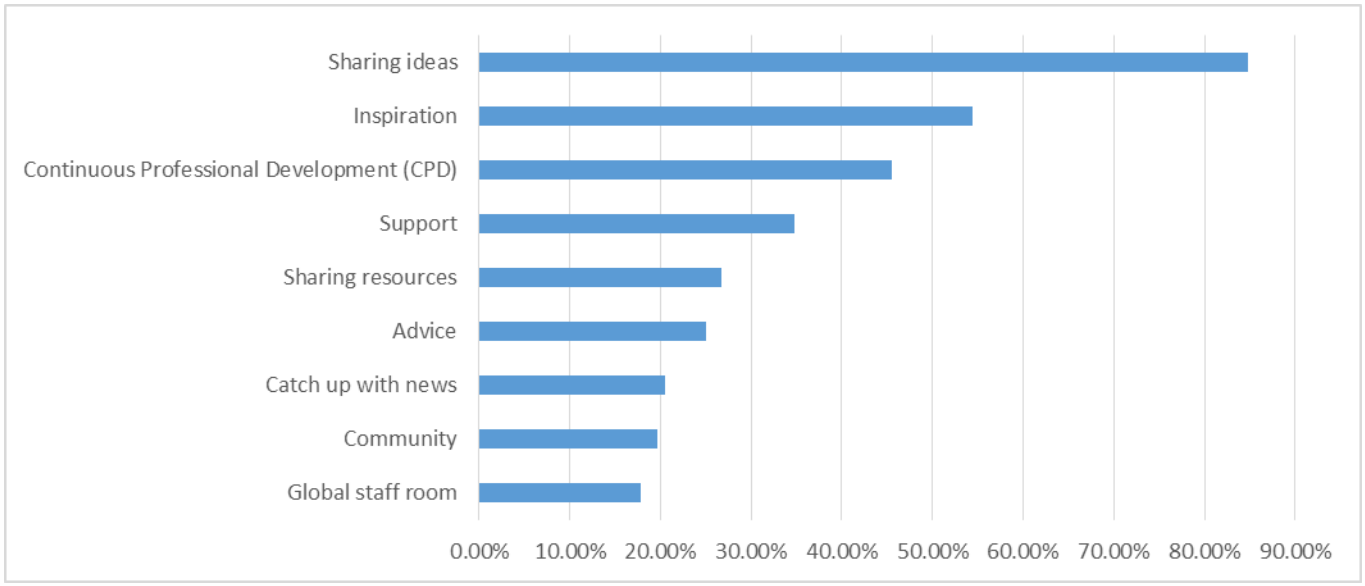

Figure 5: most commonly-used descriptors of the #MFLtwitterati

Respondents were also asked how they would describe the #MFLtwitterati in one word. A total of 104 responses were entered. The responses are displayed in figure 6, with the most common words arranged by size.

Figure 6: One-word descriptions of the #MFLTwitterati

Effect on teaching practice: the majority of respondents (88.5%) reported having tried suggestions or ideas by other #MFLtwitterati members in their teaching, and a further 74.3% reported using resources they have found via the #MFLtwitterati hashtag. When asked in an open question what the #MFLtwitterati group had brought to their teaching, 100 participants entered responses, as displayed on Figure 7. As well as these, respondents also wrote about their teaching being “livened”, “transformed”, “refreshed”, “revitalised”, “totally changed” and “revolutionised” by the group.

Figure 7: What has the #MFLTwitterati brought to your teaching?

Finally, participants were asked if they thought their teaching had improved in any way because of the #MFLtwitterati. The vast majority (87.5%) agreed. A total of 91 respondents provided examples in an open question, illustrated in figure 8. Many respondents provided actual examples of specific tools, websites and apps that they had found out about through the group. They also mentioned newer approaches to teaching such as flipped learning. Some respondents described how they have found the confidence to try new ideas and be more creative.

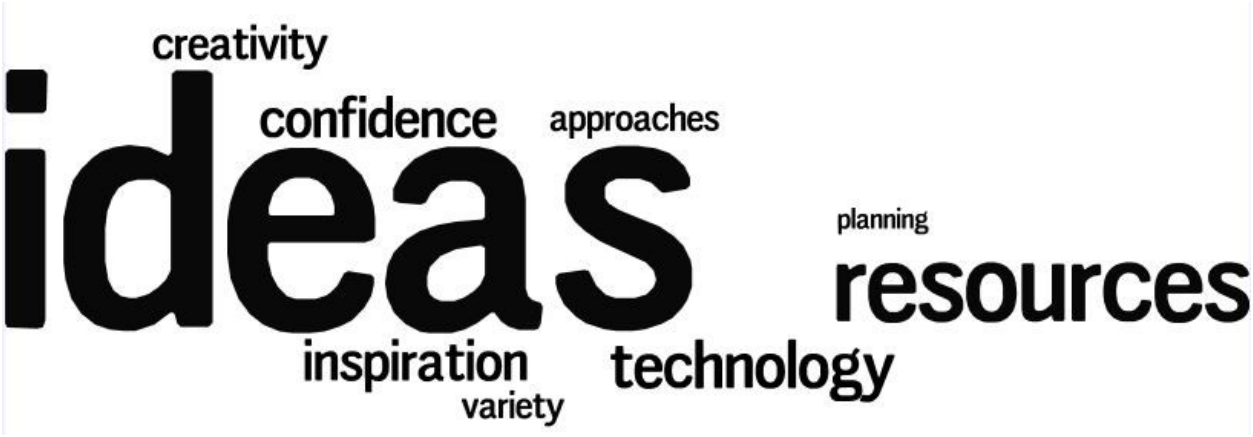

Figure 8: improvements to teaching from the #MFLTwitterati

5.3 Interview results

All 11 interviewees were language teachers, 10 at a variety of schools and one (interviewee 11) at university. All described themselves as regular Twitter users. When asked about whether Twitter is the main medium they used to keep up with language learning news, ideas and resources, eight responded “yes”. The other three included Twitter among other tools they use, such as Facebook and email groups.

All interviewees had used the hashtag in their tweets. Their reasons included giving a wider audience to their tweets, reaching like-minded people, and sharing ideas and resources. All but one of the interviewees (interviewee 11) reported having used resources recommended by an #MFLtwitterati tweet in their teaching, including photos, websites, and apps. The same ten interviewees (the school teachers) stated that they would describe the #MFLtwitterati as a community, citing reasons such as a common purpose, support, shared resources, and dialogue.

In the UK context, where all interviewees came from, CPD is a commonly-used term that appears in teacher training. Teachers are provided with some in-school CPD but they are also expected to engage with their own professional development. In response to the question “Do you consider engagement with #MFLtwitterati tweets to be part of your CPD (Continuous Professional Development)?” all ten school teachers responded affirmatively, many with replies such as “absolutely” and “definitely”. Interviewee 11 stated that it might be “too much” to consider it CPD but it is “a way to keep informed about what others do”. Similarly, all ten school teachers responded that

engaging with #MFLtwitterati tweets had improved their teaching in terms of experimenting with new ideas and creativity as well as reflecting on their practice. Interviewee 11 did not think it had had any impact on his teaching “yet”.

Three questions in the interview protocol (Q 9-11) explored the concept of the public nature of Twitter and privacy. When asked if they knew whether any students or management at their institution read their tweets, most did not know. Four school teachers were aware that their school leaders read their tweets and the university teacher replied that a few of his students follow him on Twitter. Three of the interviewees mentioned that although they were not aware of being read by students or management, they were aware of the possibility and maintained a very professional tone in their tweets. Being in a public arena had an effect on what the interviewees tweet, with many stating that they were careful about what they tweeted or retweeted. Two of the interviewees had locked their accounts so that their tweets could only be read by people they selected. All but three of the interviewees (7, 9 and 11) admitted that they sometimes communicated with other teachers on Twitter through direct messages to avoid their opinions being seen by others.

When asked for their final thoughts, interviewee 1 said she would like to see Twitter recognised as CPD. Interviewee 3 stated that “professionally, joining Twitter is the best thing I ever did” and interviewee 10 said “My teaching has been reinvigorated through Twitter and joining the MFLtwitterati. I think much more about teaching ideas than ever before and Feel like I’m right up to date with all that's happening”.

6 Discussion

In this section the results will be discussed to answer the three research questions presented in section 3.

6.1 Who are the #MFLtwitterati?

The results provide a picture of the #MFLtwitterati users as language teachers, mostly female, and mainly based in schools in the UK. The majority of teachers in the UK

(almost 75%) are women (Department of Education, 2011) so their overwhelming majority in the membership to the group was to be expected too. It is surprising that such a large proportion of the respondents work in schools and only 1.8% work at universities, where there is much activity both in language teaching and research. Also surprising is the large proportion of teachers who are based in the UK. Although the hashtag initiated and has had press coverage in the UK, it has been in use long enough to have crossed borders further afield considering the international nature of Twitter. This could perhaps be attributed to the fact that most users are UK-based and therefore some of their tweets refer to the UK context only, which would appeal more to a UK audience. The time zone may also be a relevant factor, as tweets sent from the UK would appear in the timelines of other English-speaking countries such as the USA, Canada or Australia at times that do not fit with the schedules of school teachers in those areas. Furthermore, the acronym MFL to refer to Modern Foreign Languages is mostly used in the UK, which may also explain why this hashtag has remained local to that context.

6.2 Do the practices of the #MFLtwitterati provide evidence that Twitter engagement can contribute to continuous professional development?

The results show that many survey respondents consider Twitter part of their CPD. The interviewees who worked in a school setting agreed. Nearly 50% of the survey respondents chose “CPD” as a descriptor of the group, and many of the other responses such as “sharing”, “inspiration”, “support”, and “advice” are also words that fit into the description of CPD. CPD was also mentioned by survey respondents when asked to describe the group in one word and when asked about what the group had brought to their teaching. These results confirm the previous findings of Visser et al. (2014), Lord and Lomicka (2014), Veletsianos (2017) and others. The impact on classroom practice identified fits with Carpenter and Krutka’s (2014) results and link to inspiration and the mitigation of isolation coincide with Luo, Sickel and Cheng’s (2017) and Wright’s (2010) findings respectively.

Other issues arising from the data that are related to CPD are confidentiality and public teacher profiles on Twitter. A number of participants expressed concerns about this.

Although this was not a specific question in the survey, two respondents mentioned this issue in their responses. The interviews revealed that although many of the teachers are not aware of who follows or reads them, many are very aware that Twitter is a public arena and either are careful about what they say or even lock their accounts. The large number of interviewees who admit to communicating through DM supports Campbell's (2015) statement about teachers going underground for some of their Twitter activity, but the fact that the same teachers also engage in very public activity through a popular hashtag suggests that such activity does not reduce the benefits for other members of the group as Campbell feared.

6.3 Can the #MFLtwitterati be described as a community of practice?

Evidence of engagement and practice to determine whether the #MFLtwitterati can be considered a community of practice is based both on the profile of the hashtag user, which demonstrated the general shared enterprise of language teaching, and on the practices and beliefs presented in 5.2. To evaluate membership to a community of practice by educators on Twitter, McLeay (2008) used three terms defined by Wenger (1998): mutual engagement (the negotiations among the members of the community and how this participation binds them together), joint enterprise (the shared understanding of their goals), and shared repertoire (a set of communal resources used to reach the goals of the shared enterprise).

The results in terms of awareness of the hashtag show that membership to the group of users is dynamic, with members who have used the hashtag for a relatively long time as well as newer members. The fact that most users become aware of the hashtag through noticing and recommendations suggests that members are self-selected and share a mutual interest.

The active use of the hashtag and the frequency analysis of words most utilised to describe this use as sharing, asking, advising and helping are consistent with mutual engagement activity, and the use of the Dropboxes to upload materials exemplifies the groups' shared repertoire as evidence of wanting to engage in CPD and improve their language teaching practice, as well as save time on class preparation. This

integrated use of both Twitter and Dropbox is innovative and not reported in previous research. The use of the of the dropboxes reveals an awareness of technological developments to support the sharing of resources as well as providing a repository that can be located at any time, unlike other Twitter communities that tend to post links to resources that users need to save for themselves. Further evidence of the groups' mutual engagement and shared practice is provided by the results that deal with perception of the group. These findings support previous assessments concerning the concept of language teachers forming a CoP through the use of Twitter by Lord and Lomicka (2013) and the use of hashtags by Wesely (2013). The descriptors presented in Figure 4, as well as the one-word descriptions support the notion of a community whose members describe it as a place to share ideas, feel inspired, where they can engage in CPD and feel supported as well as sharing resources and providing and getting advice, which fits with the initial findings by Dale (2013) as well as previous research by Luo, Sickel and Cheng (2017). The word "community" itself was one of the descriptors and appears in both the questions about describing the group as well as in the effect on their teaching. The fact that 86.8% of users check the hashtag either often or occasionally is further evidence of the engagement with the community. The positive descriptions as well as the majority perception that membership to the community improves their teaching supports the joint enterprise of improving their language teaching through CPD via Twitter and the hashtag. This is further supported by the clear statements from the interview results, where 10 out of 11 interviewees considered the #MFLtwitterati a community of practice and used very similar descriptions to those used by the participants in the survey.

7 Conclusion

The research presented in this article contributes to the current literature by providing evidence that teachers who use the #MFLtwitterati hashtag (mostly from school settings) engage in collaborative practices and argues that their collective can be considered a community of practice. It also provides a profile of the members of the community. The research contributes to the fields of Mobile Learning and using Twitter as a Personal Learning Network for Continuous Professional Development within a Community of Practice. It brings the often under-researched issue of mobile learning among teachers rather than for learners to the fore. In addition, it showcases how

teachers are taking CPD into their hands using the latest tools available to them, possibly due to shortages in funding for professional development funding in learning institutions. It also suggests that some teachers would like the informal CDP they engage in on Twitter recognized formally. The research also provides an insight into newer online practices, such as support through a social media tool, and the sharing of resources through Dropboxes. This research is methodologically different from previous research as it introduces the use of a Twitter Direct Messaging Interview protocol, an innovation that may be of use to researchers in many other fields.

A number of limitations affect the research as it uses self-report as a method, and the members of the community who chose to complete the survey were self-selected. Another limitation is that due to the lack of data on how many people use the hashtag, it is impossible to know what percentage of the total hashtag users the 116 survey respondents represent.

This research is easily replicable using the hashtag, even though the participants would not necessarily be the same members of the community. The introduction of Twitter polls since the research was carried out also means that further research could be carried out using these for separate questions over time. The survey questions could be adapted for other groups of language teachers or teachers of other subjects to carry out further research into Twitter communities of practice for teachers. Such research could then be compared to the results presented here. Text analysis of tweets, as carried out by Lord and Lomicka (2014), could be used to correlate actual practice and the results obtained by self-report. Finally, the recent expansion of the Twitter character limit from 140 to 280 characters may change some aspects in the way people express themselves on Twitter by reducing the amount of abbreviations and acronyms currently used, and in the case of the #MFLTwitterati hashtag it means that its 14-character length will represent 5 rather than 10 percent of the total possible length. The change in length may go some address some of the concerns some researchers have expressed regarding the previous 140-character limit (Grosseck & Holotescu, 2008) and will merit further research.

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Appendix 1: #MFLtwitterati survey questions

How did you come across the #MFLtwitterati?
Personal recommendation
Noticed it in tweets from others
Read about it
Other

Approximately how long have you been aware of the #MFLtwitterati?
Less than six months
Between six months and a year
Between one and two years
Over two years

Have you ever used the #MFLtwitterati hashtag in your tweets?
Yes
No
If yes, why?
If no, why?

Do you regularly check the #MFLtwitterati hashtag
Yes, often
Occasionally
Rarely
Never

Are you aware of the #MFLtwitterati Dropbox?
Yes
No

Do you ever download resources from the #MFLtwitterati Dropbox?
Yes, often
Occasionally
Rarely
Never

Do you add resources to the #MFLtwitterati Dropbox?
Yes, often
Occasionally
Rarely
Never

What has the #MFLtwitterati brought to your teaching?

Have you used resources you've found via the #MFLtwitterati in your teaching?
Yes
No

Have you tried suggestions by other #MFLtwitterati members in your teaching?
Yes

No

Have you recommended the #MFLtwitterati to others?
Yes
No

Do you consider the #MFLtwitterati part of your Continuous Professional Development (CPD)?
Yes
No

Do you think your teaching has improved in any way because of the #MFLtwitterati?
Yes
No

If yes, give an example of how #MFLtwitterati has improved your teaching

How would you describe the #MFLtwitterati in one word?

Are you?
Male
Female

Where do you live?
UK
Ireland
Rest of Europe
US / Canada
Rest of North / Central / South America
Africa
Asia
Australia / New Zealand
Other

Are you involved in language teaching at the moment?
Yes
No

What language(s) do you teach? (tick all that apply)
Arabic
Chinese
English
French
German
Hindustani
Italian
Irish
Japanese
Polish
Portuguese

Russian
Spanish
Welsh
Other (please specify)

Where do you currently work?
School
Further education
University
Independently
Retired
I'm a student
Other

Appendix 2: DM interview questions

Q1: Are you a language teacher? How long have you been teaching? Where do you work now (school, university)? Where (country)?

Q2: Are you a regular Twitter user?

Q3: Do you use the #MFLtwitterati hashtag in your tweets? Why?

Q4: Is Twitter the main medium you use to keep up with language learning news, ideas, resources? Why?

Q5: Have used a resource (photo, text, website, app) recommended by an #MFLtwitterati tweet in your teaching? If so please give an example.

Q6: Would you describe the #MFLtwitterati as a community? Why?

Q7: Do you consider engagement with #MFLtwitterati tweets to be part of your CPD (Continuous Professional development)?

Q8: Do you think engaging with #MFLtwitterati tweets has improved your teaching in any way? Why?

Q9: Do any of your school leaders or any of your students or their parents read your tweets?

Q10: Does the fact that Twitter is a public arena have an effect on what you tweet as a teacher? Do you have concerns about this?

Q11: Do you ever communicate with other teachers on Twitter through direct messages to avoid your opinions being seen by others?

Q12: Is there anything else you would like to add regarding being a teacher and using Twitter?

Publication 9:

Rosell-Aguilar, F. (2020). Twitter as a Language Learning Tool: The Learners' Perspective. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, 10(4), 1-13.

Abstract

Studies into the use of Twitter for language learning have mostly been small-scale evaluations undertaken by teachers researching the effectiveness of their own initiatives to use it with their students. To date, there has not been a large quantitative study of how language learners use Twitter autonomously. This paper reports on a large-scale study (n=370) of language learners who use Twitter. It provides a user profile, their practices and beliefs about how helpful Twitter is as a tool for language learning. The results provide the first profile of the autonomous user of Twitter as a language learning tool, show very positive attitudes towards the use of Twitter, and provide evidence that learners learn new vocabulary and culturally-relevant information about the areas where the target language is spoken. Many learners engage in production of target language output and make the most of the opportunities Twitter presents to be exposed to target language input and interaction with native speakers, making Twitter a useful tool for their autonomous language learning development.

Keywords: Microblogging, Twitter, Autonomous Learning, Informal Learning, Language Learning

1 Introduction

Computer-Assisted Language Learning has been defined as “the search for and study of applications of the computer in language teaching and learning” (Levy, 1997, p.1). This involves both the development of software and hardware, the use of existing digital tools for language learning purposes, and the study of how the use of these technologies can lead to language acquisition. Utilising social media for language learning purposes falls within the second activity: the use of existing tools, albeit autonomously for the most part. Autonomous learning (in which the learner takes charge of their own learning) is a goal that can be achieved through self-directed learning using learning resources available to the learner, and social media provides a rich source of resources.

Twitter is a Social Networking Site (SNS) that can be accessed from a variety of devices, from desktop computers to mobile phones. Tweets are short messages of up to 280 characters in length (this limit was 140 characters until November 2017). As well as text, users can share hyperlinks, photographs, video, and create polls. Twitter can identify and offer automated translations for 40 different languages. Twitter launched in 2006, and since then has become a hugely popular platform, with enormous impact on the delivery and sharing of news, engagement in politics, promotion of businesses and entertainment, and delivery of education among many other subjects. The use of hashtags within tweets allows topics to be highlighted, and when topics are mentioned in large numbers, they 'trend' on Twitter, drawing attention to the hashtag. Twitter has over 330 million active monthly users, of whom 80% access the tool from mobile devices (Smith, 2020).

Research into Twitter for language learning has so far provided some evidence of engagement between learners and with native speakers, community development, and some language acquisition and improvement in areas such as vocabulary and pronunciation (Hattem & Lomicka, 2016). However, with some exceptions (e.g. Ng, Thang & Noor, 2018) most of this research has been centred on teacher-directed activities in which participants were assigned tasks they would not otherwise have undertaken and, in some occasions, they were prompted to create their Twitter accounts for the sole purpose of the research. In addition, the participants were for the most part university students, a relatively homogenous cohort in terms of age and motivation to learn as part of their studies. As a result, the results from this type of research do not present or evaluate the type of Twitter activities that learners undertake of their own volition as support for their language learning, whether to support formal learning or as part of autonomous learning. They also fail to provide a clear picture of the type of learner that undertakes language learning activity through Twitter. This paper seeks to address those gaps in the research by providing a profile of Twitter users, their practices, and beliefs about using Twitter as a language learning tool.

2 Background

Twitter can provide access to materials that fit with Second Language Acquisition (SLA) theory recommendations, such as those that are authentic (Little, 1997), those that incorporate meaningful and engaging activities (Oxford, 1990), those that offer opportunities to hear modified comprehensible input that allows focus on target features of the second language (Holliday, 1999), and those that are appropriate to the medium used (Furstenberg, 1997).

The potential uses of Twitter as a language learning tool have been explored by many practitioners and researchers (Dickens, 2008; Borau, Ullrich, Feng & Shen, 2009; Craig, 2012; Hattem, 2014). These uses can be summarised under the categories of access to input, output and interaction as presented in Figure 1.

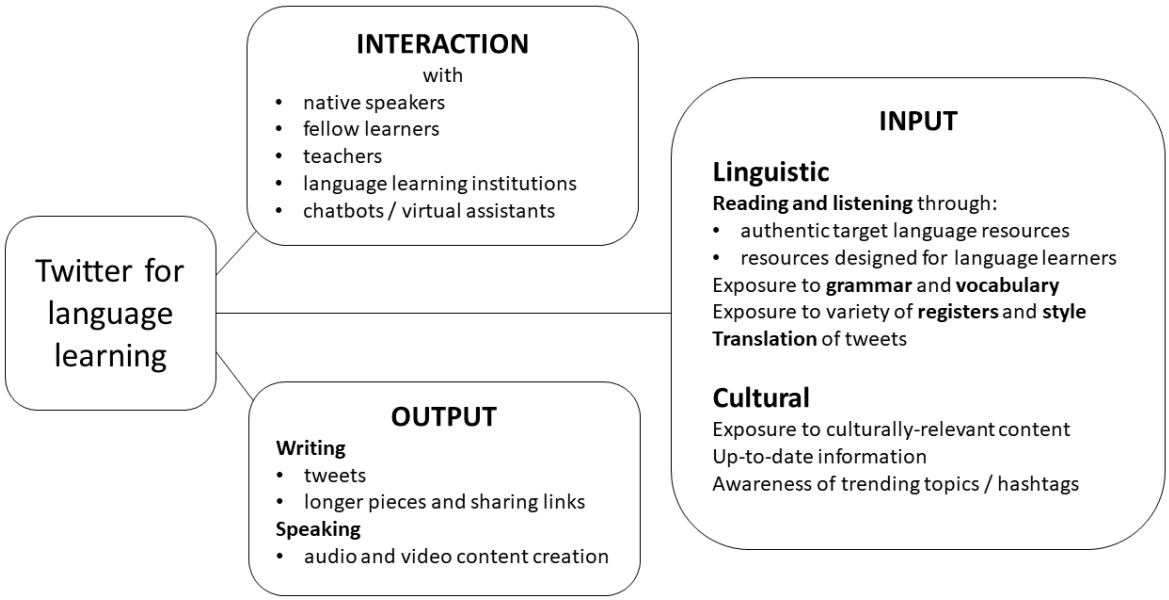

Figure 1. Potential uses of Twitter as a language learning tool (adapted from Rosell-Aguilar, 2018).

Knowledge, as it is understood from a constructivist point of view, is constructed through active exploration, observation, processing and interpretation (Cooper, 1993). Accessing language learning resources through social media is consistent with this learning process, where the user can access resources and activate knowledge. The social dimension of knowledge construction, following the Vygotskian socio-

constructivist perspective, which claims that human development is socially situated and knowledge is constructed through interaction with others, can be added through the interaction among peers or between tutors and learners that learning environments such as Twitter can afford.

A number of ways for language teaching practitioners to engage learners using Twitter have been suggested, including participating in language tandems (Reinhardt, Wheeler & Ebner, 2012), engaging in language play (Hattem, 2014), posting homework and intercultural information exchanges (Lee & Markey, 2014), and sharing experiences of visiting a target language area (Plutino, 2017).

Whilst these activities can be introduced to the classroom by teachers, there are many independent learners who utilise Twitter autonomously. The use of Twitter for language learning purposes is consistent with the view of learning as something that happens in everyday life outside the classroom, whether intentionally or accidentally, as advocated by theories of informal and lifelong learning (Naismith, Lonsdale, Vavoula, & Sharples, 2004).

Learning languages through social media shifts the focus to the learner and how they use the technology, making it important to research “the ways in which users appropriate the tools, dealing with constraints as well as spaces allowing them opportunities for action” (Lamy & Mangenot, 2013, p. 201). As Reinders and White (2016) point out, tracing the role of social media in contemporary experiences of language learning is a challenge to the field, and more empirical studies are needed which describe how learners use social media for language learning purposes. The use of Twitter undoubtedly facilitates access to language learning resources in an autonomous manner, but to evaluate whether engaging with these resources is a worthwhile activity, more needs to be known about the learners who engage in such activities, what they do, and what they think of the use of Twitter for language learning purposes.

The use of Twitter for language learning has been researched by a number of authors (see Rosell-Aguilar, 2018 for a detailed review). In a review of 17 studies into Twitter for language learning, Hattem and Lomicka (2016) highlight the potential for promoting interaction and communication (among learners, between learners and teachers, and between learners and native speakers), noticing and practising specific language skills and competencies (grammar, pronunciation, focus on form, providing feedback and negotiation of meaning), and community building. The authors also highlight some challenges such as the overwhelming amount of content and activity.

Some studies have found positive effects in their participants' production of output in the target language (TL) and communication with native speakers (Ullrich et al., 2008; Kim, Park & Baek, 2011, Blattner & Dalola, 2018). Others have found positive results in terms of developing a sense of community and encouragement to participation (Antenos-Conforti, 2009) and promoting communication among students and between students and tutors (Kelly, 2019). There have also been studies into the acquisition and improvement of pronunciation through Twitter (Mompean & Fouz-González, 2016; Plutino, 2017) whilst other studies have focused on intercultural exchanges (Lomicka & Lord, 2012; Lee & Markey, 2014).

The character limit on Twitter has provoked discussion among researchers who find it valuable and others who consider it a hindrance, particularly when the limit was set at 140 characters for all languages. Some think that the limit hinders the natural flow of language and can lead to the use of bad grammar (Grosseck & Holotescu, 2008), whilst other researchers propose that the limit encourages more precise thinking, editing and synthesising of language (Dunlap & Lowenthal, 2009, Plutino, 2017). The limit can be more constrictive depending on the language used: for some languages the 280-character limit restricts the message to just a few words, whereas in other languages 140 characters is enough to express much more content, which explains why the character limit remains at 140 for languages such as Chinese, Japanese and Korean.

Some Twitter users identify as language learners on their Twitter biography (the information they include to describe themselves). Looking at these users' Twitter accounts, it is easy to find many examples of varying degrees of engagement, such as retweeting Tweets in their target language, liking Tweets from language learning institutions, interaction with native speakers and with fellow learners, and tweeting in the target language. These practices are an indication of the type of activity that language learners can undertake to develop their skills using Twitter. Research into this type of informal language learning via Twitter has not been reported so far. Neither has there been an attempt at profiling such a learner. Panter's (2010) concept of 'teaching strangers', coined to describe the challenges that librarians are faced with to support learning by providing suitable resources and advice for students who are unknown to them, is useful here: teachers in a traditional education setting usually know their students: whether they fall into the typical demographic for their institution, their socio-economic background, cultural make-up, learning preferences etc., and they use or design appropriate resources and tasks taking these circumstances into consideration. In a medium such as Twitter, the audience that engages in language learning is unknown: they are 'strangers' with varied levels of target language fluency, with varied backgrounds, educational level, interests and beliefs. The study that this paper reports on focuses on the profiles, practices and beliefs of language learners who use Twitter autonomously rather than because of teacher or researcher intervention, thus 'personalising the stranger' who uses Twitter and providing insight into the type of learner that engages in such online activity.

3 Research questions

In order to fill the gap in the information available about the autonomous use of Twitter as a language learning tool, the main three research questions that this paper reports on are:

1. Who uses Twitter for language learning purposes?
2. What practices do Twitter users engage in for language learning purposes?
3. Can users learn languages using Twitter?

The data obtained serves two purposes: to ‘personalise the stranger’ and to assess whether the identified potential of Twitter as a language learning tool is indeed perceived as such by the participants of this study.

4 Method

A survey was piloted with ten volunteers known by the researcher to be frequent Twitter users who study languages, as they interact frequently with the Twitter account of the department of Languages at the researcher’s institution. The volunteers were approached via Twitter and asked to complete the survey and provide feedback on clarity of questions, time it took to complete, and whether they thought any questions should be added or omitted. Their replies also helped to generate multiple choices for some of the questions that were open in the pilot survey.

The final survey consisted of 30 items: 27 of these were multiple-choice, with some open follow-up questions asking participants to provide examples, further details, or give reasons for their choices, and three standalone open questions. It is available online (Rosell-Aguilar, 2020). The research was approved by the Open University Human Research Ethics Committee. The survey was created using Onlinesurveys.ac.uk, whose servers are in the UK, thus complying with European regulations on data hosting and storage.

Four versions of the survey were written in English, Spanish, French and Italian in an effort to attract a variety of respondents. All versions contained the same questions in the same order. Links to the relevant survey asking potential participants to take part were distributed on Twitter. The researcher also encouraged other language professionals and institutions to retweet the different tweets. The English language tweet obtained the most retweets, followed by the Spanish language tweet, the French tweet and the Italian tweet.

Some participants took the survey in a language other than their first language: 80% of respondents to the Italian survey identified Italian as their first language. For the Spanish survey, the proportion of first language Spanish speakers was 67.9%, and for the English survey 65% of participants indicated that English was their first language.

A much smaller proportion of native speakers took the French survey (38.5%), so the majority of respondents to that particular survey took it in a language other than their first language.

The surveys were open for seven months. A total of 401 unique responses were collected: 289 for the English survey, 81 for the Spanish survey, and 26 and five responses respectively for the French and Italian surveys. Participants who had a Twitter account but hardly ever used it, used Twitter mostly as a private communication tool, or had a Twitter account but never use it were removed from the results from this study as it is concerned with users who engage with Twitter on a regular, non-private, manner (n=370).

The survey items which provided data for the first question included questions about gender, age, language(s) they were learning, proficiency level, how long they had studied the language(s) for, and whether they were studying the language(s) formally or informally. They also asked about their Twitter use: how long they had been using it, how often, which devices they used, and the amount of time they normally spent using Twitter at a time. To answer the second question, items in the survey asked participants if they ever tweeted in their target language and why, what language learning activities they engaged with on Twitter, and whether they mostly focused on meaning, form or both when reading tweets in the target language. The items used to provide data for the third question asked participants whether they thought that Twitter could contribute to language learning and why, whether Twitter had helped them learn new vocabulary, grammar, or information about the culture of the areas where the target language is spoken, what they considered most useful about using Twitter to support their language learning, the relationships they had formed with fellow language learners on Twitter, and whether they had any concerns as language learners and Twitter users.

None of the questions in the survey were compulsory, therefore not all questions received the same number of responses. No reward was offered for taking part in the research to avoid a false sense of motivation (Mompean & Fouz-González, 2016).

The results were analysed using the online survey site's own statistics tools. Because the surveys gathered data in four languages, it was decided not to use qualitative data analysis software for the responses to open questions. These were categorised following the thematic analysis process suggested by Braun and Clarke (2006): responses were read three times (once without coding for general impressions, a second time coding and a third time to check the coding), coded depending on the theme by two researchers, and minor discrepancies in categorisation resolved through discussion.

5 Results

The results are presented here in three sections corresponding to the main research questions.

5.1 Who Uses Twitter for Language Learning Purposes?

The user profile presented here is based on the responses from participants in this particular survey. The gender of participants was 63.5% female and 34.6% male. The remaining 1.9% of participants chose not to identify as male or female. Participants between the ages of 25 and 44 made up almost half the respondents. The full breakdown was 1.4% under 18, 17.3% between 18 and 24, 26% between 25-34, 24.4% between 35-44, 21.1% between 45-54, 7.6% between 55-64, and 2.2% over 65.

The main languages that respondents were learning were German (19.9%), Spanish (17.4%), English (15%), and French (11.8%), followed by Welsh (4.5%), Japanese (4.2%), Italian (3.8%) and others. Participants described their language level as beginner (21.5%), intermediate (36.7%), advanced (31%), or near-native (10.9%). Most respondents (58.6%) had studied the language they were learning for over five years, whereas the rest had been studying between three and five years (12.3%), between one and two years (15.1%) or less than one year (14%). In addition, over a quarter of respondents (28.9%) were studying the language formally at school, college or university. A further 48.2% were learning informally with resources such as books, audio and video materials, or apps, and the remaining 22.9% were no longer actively

studying but continued to be interested in the language. Most respondents (84.7%) did not currently live in a geographical area where the language they were learning is an official language.

Most respondents (58.6%) had been using Twitter for over three years. A further 28.6% between one and three years, 6.8% between six months and a year, and 5.9% for less than six months. Their use of Twitter varied: 57.3% tweeted regularly and read tweets from accounts they followed, 38.9% rarely tweeted but used Twitter to follow others, and 3.8% tweeted regularly but hardly followed other accounts.

Twitter use among the respondents was very frequent: 81.4% used Twitter at least once every day (16.8% about once a day, 32.4% between two and five times a day and 32.2% over five times a day). The remaining 18.6% used it less frequently (14.3% several times a week, 3.2% about once a week, and 1.1% less frequently than once a week). The types of device that respondents normally used to access Twitter were mostly mobile devices: 69.2% of participants used either a mobile phone (55.7%) or a tablet (13.5%), and the remaining 30.8% used a desktop computer or laptop. The amount of time they normally spent using Twitter at a time was mostly between five and 15 minutes: 14.1% used it for less than five minutes at a time, 21.4% for around five minutes, 24.1% for around 10, 16.3% for around 15 minutes, 14.4% between 16 and 30 minutes, and 9.8% for over 30 minutes.

5.2 What Practices Do Twitter Users Engage in for Language Learning Purposes?

Participants were asked if they ever tweeted in the target language. The choice range was ‘often’ (selected by 16.8%), ‘occasionally’ (27%), ‘rarely’ (31.1%) and ‘never’ (25.1%). A thematic analysis of the reasons given for their choice produced nine main reasons, presented on Table 1. Some participants provided several reasons and other reasons did not appear with enough frequency to be listed on the table, which explains why the percentages within each column do not add up to 100%. For those who do rarely or never tweet in their target language, the main reason is not having any

followers who use the language, followed by believing that their language level is not good enough and lack of confidence.

	Never	Rarely	Occasionally	Often
Lack of confidence	21.62%	23.33%	6.49%	0.00%
Not good enough TL level	21.62%	11.11%	2.60%	0.00%
Cannot see a reason to do it	0.41%	5.56%	1.30%	0.00%
No followers who use TL	24.32%	30.00%	2.60%	0.00%
To communicate with other TL users	0.00%	5.56%	53.25%	42.00%
Fun	0.00%	2.22%	9.09%	4.00%
Language practice	0.00%	6.67%	23.38%	42.00%
Satisfaction / motivation	0.00%	2.22%	10.39%	2.00%
For work or other reasons	0.00%	0.00%	0.00%	14.00%

Table 1: frequency and reasons for tweeting in the target language or not.

Seven choices of other language learning activities that users can engage with on Twitter were presented to participants, who could select as many as applicable to them. A total of 1457 responses were recorded from the 370 participants. These were, in order of popularity: Reading tweets in the TL written by native speakers, selected by 78.38% of the respondents; Following native speakers of the TL (68.11%); Following language learning institutions / providers / professionals who tweet LL resources or tips (67.30%); Accessing LL resources (64.32%);

Reading tweets in L1 about the TL (52.52%); Following fellow TL learners (31.35%); and Reading tweets in the TL written by other learners (30.81%).
Participants were asked what they mostly focused on when reading tweets in the TL. Of the 330 who responded to this question, 18 (5.5%) selected “the way the language is used”, 92 (27.9%) selected “the meaning of the tweet”, and 220 (66.7%) selected “both”.

5.3 Can Users Learn Languages Using Twitter?

Some 369 participants responded to a question about whether they thought that Twitter can contribute to language learning. Of these, 350 (94.9%) replied “yes” and 292 provided reasons for their choice. The vast majority (90.4%) referred to exposure to the target language. Other popular reasons were access to information, news and resources (26%), following people or institutions who tweet in the target language (22.3%), communication and interaction with other users of the target language (13.7%), and the fact that they are exposed to current, authentic, less formal conversational language (8.22%). Some 21 respondents (7.19%) mentioned that the 140-character limit, which still in place when this research was undertaken, was appealing to them as it does not require a long time to read and they can be easily comprehended, as opposed to other resources they find online. Among those who provided a reason why they did not think Twitter could contribute to their language learning, five were sceptical about how this could be achieved, three referred to the 140-character limit as a barrier, a further two mentioned the type of content (“superficial”, “not real communication”), and another two mentioned the type of language used on Twitter (abbreviations, “irregular grammar”).

Vocabulary, Grammar and Culture

Out of 356 participants who responded to the question “Have you learnt any new vocabulary in the language you’re learning that you first noticed in a tweet?”, 224 (62.9%) chose “yes” and 132 (37.1%) chose “No”. Those who responded in the affirmative were asked to provide an example and 109 did. The examples included nouns, verbs and adjectives in a variety of languages. A further 21 did not provide concrete examples but listed categories such as “technical terms”, “slang”, or “politics”, and the remaining 26 respondents stated that they had learned new vocabulary but could not remember any examples at the time. A few of these made the point that they do not usually remember where they learnt words they had assimilated into their vocabulary.

The next question asked participants if they had learnt any new grammar rules in their TL that they had first noticed in a tweet. Of the 353 respondents who replied to this question, 81 (22.9%) selected “yes” and 272 (77.1%) selected “no”. The request for examples elicited 56 responses. Of these, 12 indicated that they did not recall any

specific examples, but some noted that the exposure to the target language in the tweets they read had given them an understanding: "Can't think of a specific example at the moment - is mostly just repeated exposure leading to a feeling about what is and isn't correct usage". The remaining replies included examples such as verb conjugations, use of the subjunctive, prepositions, declensions, adjectival agreement, word position within sentences, and forms of the negative.

With regard to learning about the culture of the areas where the TL is spoken, 255 participants (70.8%) claimed that they had learnt new facts about those areas from tweets they had encountered, whereas 105 (29.2%) had not. When those who responded that they had were asked about the subjects that they had learnt about, the most popular category was News / Current affairs with 164 responses (64.3%), followed by Art and Literature (154 / 60.4%), Politics (117 / 45.9%), History (87 / 34.1%), Education (81 / 31.8%), Entertainment (80 / 31.4%), Geography (60 / 23.5%%), Environment (52 / 20.4%), Sport (51 / 20.0%) and Work (50 / 19.6%).

Most Useful Features

Participants were asked what they considered most useful about using Twitter to support their language learning. A total of 241 valid responses were collected. Many of these were coded into more than one category as some of the respondents mentioned several issues within a single response, so the total number of coded responses was 347, which were divided into four main categories: language practice, features and nature of using Twitter, information about the areas where the target language is spoken, and language learning resources. The most popular category was 'Language practice', with 193 responses. This category was divided into two sub-categories: 'Exposure to target language' (125 responses) and 'Access to others / Interaction' (68 responses). In the 'Exposure to target language' category, recurring themes from those who provided further details were the fact that the language is authentic (34 responses), that the language found on Twitter is colloquial in contrast with more formal language they see in books or the press (15 responses), vocabulary (19 responses), and grammar (4 responses): a typical comment was “it’s helpful to expose yourself to informal, colloquial internet language as well”. In the 'Access to others / interaction', the recurring themes were interaction with native speakers (20

responses), interaction with fellow learners (10 responses), and making friends (2 responses). Another popular category, with 69 responses, referred to the features and nature of using Twitter. These included the fact that information is bitesize (20 responses), its fast nature and immediacy (15 responses), that it is easy to use and convenient (12 responses), the fact that it is not a formal learning environment and something that they use as part of their routine (10 responses), and its 24-hour availability (8 responses): “it’s integrated into my wider Twitter use, rather than being something I proactively have to remember to do”. The third category was ‘information about the areas where the target language is spoken’, with 47 responses. Respondents referred to learning about culture, politics and current events. Some 15 respondents specified that they liked the fact that they could personalise their learning by reading tweets that were specific to their own personal interests: “being able to learn through what matters to me, like the teams I support and music I like”. The fourth and final category was language learning resources, with 38 responses. Respondents referred to links to resources and activities, language learning tips, and contact with teachers and institutions that teach languages. Five respondents indicated that engaging with Twitter helps their motivation and increases their confidence: “now and again I can see a tweet which I completely understand and it feels like an achievement and that I am getting better”.

Relationships with Other Users

Participants were asked to choose one among six options to describe the relationships they had formed with fellow language learners on Twitter. Some 165 respondents (59.8%) chose “I wouldn't say I’ve formed a relationship with other language learners I follow or who follow me”. This was followed by “Members of a community of learners with a joint purpose (language learning) who share ideas, resources and support”, selected by 44 respondents (15.9%), “People I can obtain interesting / useful information or resources from”, selected by 42 respondents (15.2%), “Acquaintances” (14 respondents, 5.1%), “Friends” (6 respondents, 2.2%), and “other” (5 respondents, 1.8%). These specified that they did not engage with other learners on Twitter; some of them indicated that they use other platforms such as Facebook for more informal contact.

Concerns

Respondents were asked to select from a list what concerns they may have as language learners and Twitter users, if any. Of these, 123 respondents (33.2%) indicated that they did not have any concerns. The concerns of the remaining 247 participants were split as follows: making mistakes if they tweet in the language they are learning (98 responses, 39.7%), concerns that tweets may contain information that is inaccurate / just opinion rather than fact (62, 25.1%), concerns about learning incorrect use of language from fellow learners (48, 19.4%), and exposure to abuse / negative tweets (10, 4%). A further 10 respondents (4%) chose 'other'. The 'other' concerns included use of abbreviations and acronyms in tweets which make them difficult to understand, advertising, the 140-character limit, and not making connections with native speakers. One respondent wrote “People don’t follow me so I can practice my bad Italian on them”.

Overall Assessment for Language Learning Purposes

Finally, participants were asked to what extent they agreed with two statements. The Likert-scale options ranged from 1=strongly disagree to 5=strongly agree. The first statement was “using Twitter has improved my knowledge of the language I’m learning”. A total of 358 responses were collected and the mean average was 3.61. The second statement was “using Twitter has improved my knowledge of the areas where the language I’m learning is spoken”. A total of 357 responses were collected and the mean average was 3.77.

6 Discussion

The results are discussed here first in relation to the three research questions and then to assess whether the potential of Twitter as a language learning tool as identified by previous research is perceived as such by the participants of this study.

The respondent profile provides a picture of autonomous users who utilise Twitter to support their language learning, unreported so far. This picture helps to 'personalise the stranger', one of the aims of the study. The larger proportion of female users corresponds with the general picture across most language learning institutions, where female students tend to outnumber male students. The age of respondents also fits with the average age of Twitter users in general. Respondents were learning a variety of languages, but these were among the most-commonly studied languages in the world and also among the most-used languages on Twitter. This suggests that Twitter may be of less use to learners of less commonly-taught languages. Since most previous studies of Twitter users had been carried out by researchers within an educational setting, the fact that only 28.9% of respondents were formally studying a language makes the cohort very different from those surveyed in previous research and provides a realistic picture of the characteristics of autonomous language learners on Twitter. Given the large number of participants, this provides reliability to the data gathered.

The practices recorded capture an image of experienced, long-term users who utilise Twitter frequently, mostly from mobile devices, and for relatively short periods of time. Almost three quarters of respondents have tweeted in the target language (even if for some this is a rare occurrence), which shows a high proportion of participants engaging with target language production (similar to findings by Kim, Park and Baek, 2011). Unsurprisingly, those learners who tweet in the target language most often reported the highest proportion of useful language learning activity such as language practice and communicating with target language users. The other practices that users engaged with also showed useful strategies for autonomous language learning such as reading authentic material in the target language and accessing resources. Learners clearly showed a preference for interacting with native speakers rather than fellow learners. The respondents also showed preference for focusing on meaning ('the meaning of the tweet') rather than form ('the way the language is used'), although the largest proportion indicated that they focused on both. Whereas almost two thirds of participants indicated that they had noticed new vocabulary and almost half of these were able to produce examples, over three quarters of respondents indicated that they had not noticed any new grammatical features and only just over 10% of the total

number of respondents were able to provide an example. With over 70% of respondents reporting that they had learnt something new about the cultures of the areas where their target language is spoken, Twitter can be recognised as a source of knowledge in a variety of subjects about these areas in a way that is personalised to the learner.

The beliefs about Twitter as a language learning tool showed that the vast majority of respondents (94.9%) believed using it can contribute to their language learning for a variety of reasons, exposure to the target language being the most popular. Similarly, the results produced very positive statements about improvement of language ability and knowledge of the target language cultures, which matches previous research by Ullrich at al. (2008). Despite concerns about the 140-character limit expressed by previous research (Lee & Markey, 2014), only three users mentioned this as a negative feature whereas 21 mentioned it as a positive. The affordances of Twitter as an environment to foster a community between language learners (Antenos-Conforti, 2009; Lomicka & Lord, 2012), however, do not appear to be important to most of the respondents. The fact that a third of respondents did not have any concerns about using Twitter as a language learning tool was positive, as was the fact that the concerns reported by those who had them focused on linguistic issues rather than any of the negative features that are often reported by the media relating to bullying and negativity (which was mentioned by a low 10 respondents). The linguistic concerns, such as making mistakes or worrying about the accuracy of the language they encountered, were typical of language learners in any environment.

In terms of revisiting the potential of Twitter as a language learning tool, the results provide evidence of Twitter being used as a social environment (Vie, 2007) where learners are exposed to target language and immersed in an environment where they encounter comprehensible input, produce output and engage in interaction (Hattem, 2014). This research takes that further by demonstrating that for many users that exposure to the target language and its speakers is the main reason and perceived benefit of using it. Learners find opportunities to navigate across languages, identities and cultures, as Chen (2013) had argued, and learn about a variety of topics in current

affairs, politics and culture, as proposed by Reindhart, Wheeler and Ebner, (2012). The positive attitudes reported by Lin, Warschauer and Blake (2016) are also evidenced in this research. Although engagement with fellow learners was not perceived as being part of a community by most of the participants, there is evidence that users benefit from the social interactions with and output from native speakers in their Twitter network. This evidence supports the claim by Craig (2012) that Twitter can provide linguistic, cultural and social benefits.

7 Limitations, further research and conclusion

7.1 Limitations:

A number of limitations affect this study. The data collected is self-reported, and therefore affected by issues such as time limitation, credibility, inaccuracy or memory (Paulhus & Vazire, 2007). It was also collected online, which adds anonymity and can sometimes lead to non-serious responses (Gosling, Vazire, Srivastava & John, 2004). Whilst these limitations exist, self-report is an established method any non-serious responses to the survey were easily identified and removed. In addition, gathering data through a link within a tweet is consistent with ethnographic research into the use of Twitter and brings the data collection method within the users' environment. This does however bring another limitation, which is the validity of the sample. The call for participants to take part was shared by followers of the researcher's own Twitter account and those who in turn follow them. There could be an argument that the sample is therefore restricted and not representative. Whilst this cannot be avoided, the fact that many of those who shared the link to the survey were language learners or involved in language teaching helped the survey find the right audience. Both the self-report and online nature of the survey can also lead to responses being short and superficial. Although most responses were short and some could be described as superficial, many of the responses provided useful information and insight – it could be argued that brevity is not a barrier to conveying meaning among Twitter users, who are used to condensing thoughts into short messages.

The research has also been limited to quantitative methods so far, which fits this exploratory stage and provides the opportunity to obtain reliability through the large numbers of responses gathered.

7.2 Further research:

The study would be easy to replicate, which may be a useful activity at a later point as this would allow a comparison between data sets. Because of the nature of the respondents as autonomous users, it is not possible to correlate their responses with actual language gains. However, a replication of this study within the context of a teacher / researcher-led activity could include targeted exposure to tweets within a certain topic and semantic field and pre-and post-tests could be carried out to explore vocabulary gains and recollection, for example.

7.3 Conclusion:

Online applications and tools appear and disappear, evolve into massively-popular environments or go out of fashion, making it harder to choose which ones to evaluate and research beyond the initial possible potential for learning activity. As the purpose of some tools becomes broader - Twitter was not designed as a language learning and teaching tool - the impact of social environments with massive user numbers on teaching and learning must continue to be part of the research agenda.

The research presented in this paper advances the knowledge in the area of Twitter for language learning by providing a profile of the autonomous language learner and Twitter user, their practices and beliefs. It is also the first large-scale study into Twitter for language learning outside the confines of teacher-led activity. Such evaluations of learning tools are scarce, but they provide insights that would not be available otherwise and help create a picture of how tools are utilised in a more ethnographic way. It could be argued that many of the results found in this study are unsurprising. The fact that the users who use Twitter most often are the most likely to find it useful for learning, or that the main gain for language learning is vocabulary acquisition could have been easily hypothesised, but up to this point there was no evidence to support

these hypotheses. What this research has found is that many language learners use Twitter as part of their daily routine, that using Twitter as a language learning tool is integrated into their wider Twitter activity, and it has become one of the range of activities they undertake to support their autonomous language learning, regardless of whether they are formal or informal learners. As such, the use of Twitter can be included in the range of activities that language learners can undertake as a means to access exposure to input in the target language, information about the cultures where it is spoken, and a platform for production of input and interaction.

This paper has focused on the autonomous activities that language learners engage in on Twitter. Many of these are likely to be replicated on other microblogging tools such as Instagram or Weibo. Practitioners wishing to incorporate Twitter into their teaching practice can use some of the activities carried out in the previous research reported above such as tasks that promote noticing and practising specific language skills and competencies, production of output and interaction with native speakers, or taking part in intercultural exchanges. These activities, however, can be time-consuming to prepare and make students use their personal social media for specific task - which they may be reluctant to do. Also, activities initiated by teachers may not lead to learners incorporating social media into their lifelong learning repertoire. The results from this paper show that learners can use microblogging autonomously with positive results, and teachers may wish to simply demonstrate to their students some of the activities that learners can engage in on social media to support their independent language learning, leading perhaps to more individualised, motivating and successful use.

Chapter 3: Discussion of results: contributions and impact of the research

As the results from each publication are presented in full in Chapter two, this chapter does not aim to repeat the data provided by the different studies. Instead, it highlights some of the most relevant findings of the research on each technology from a current perspective, nearly a decade on for some of the earliest research, and how these findings have impacted and contributed to the fields of CALL, MALL, and autonomous learning.

Technology I: Podcasting as a language learning and teaching tool

Publication 1 provided a taxonomy of podcasting resources and an overview of the potential of podcasting as a language learning tool. It also evaluated a number of podcasts to showcase different approaches to design before suggesting a series of design principles. Despite being written in 2005 and published in 2007, the taxonomy and design principles are still relevant today. In other ways, some of the content and considerations outlined in the publication have become outdated: at the time of writing, the smartphone had not been made available to the public. Because of this, claims such as “the more affordances that the formats allow, the more restrictions that are placed in terms of the audience that the materials can reach and the mobility they allow” (p. 487) are no longer accurate. At the time, the mobile devices used to listen to podcasts were mainly personal media players (e.g. iPods), many of which did not have video playback capabilities, PDAs with black and white screens, or desktop computers. The smartphone (and later the tablet) changed this completely, offering a single device with audio and video playback, and access to online resources and other ancillary materials. Similarly, the issue of transfer of podcasts and other resources downloaded on desktop computers to mobile devices is no longer a concern as these are downloaded directly to the device. The conclusion, however, somewhat foretold a development that was to come, as it argued for the delivery of non-audiovisual materials to support learners as online learning objects that could be accessed separately (transcripts, grammar explanations and exercises), which is exactly what apps can do nowadays.

The article also included a reference to Kukulska-Hulme & Shield (2006), who hypothesised back then that “the arrival of new activities through new devices may

change the learning experience by possibly widening participation, giving more flexible access, shifting focus to aural learning, stimulating informal learning and making it easier for learners to contribute to, and build on, course content" (in Rosell-Aguilar, 2007, p. 489). This hypothesis was very accurate, as the affordances of the Social and Semantic Web have afforded the changes predicted.

Publication 1 suggested that the research agenda should include finding out about the capabilities of the devices owned by learners, how they use the podcasts they find, their impressions of using podcasts for LL and evidence of learning. This became the basis for the research presented in publications 2 and 3, which was the first (and to this day remains the largest) study of independent iTunes U users.

Publications 2 and 3 provided a hitherto unknown profile of the iTunes U learner, how they used resources and what they thought about the resources and podcasting itself, which over 80% of respondents rated as good/very good. The research presented in publication 2 also highlighted some differences between language learners and learners of other subjects. These publications also utilised the concept of internal and external learners to separate formal and informal / autonomous learners. This showcased the differences in behaviours between both sets, and represented a considerable departure from previously-published results, particularly in terms of transfer to mobile devices (70% of participants) and listening on the go whilst doing other activities (60%). This supports the notion that the differences in practices are dependent on context: where users find these podcasts and why they are listening, as a student who is doing homework or as an informal learner, for example. Furthermore, the evidence supported considering listening to iTunes U podcasts a mobile learning activity, even when smartphones were only five years old at the time. Because of this, the article emphasised that podcasts should be delivered taking MALL best practice into account for their design, including podcast length (which at the time tended to be very long). This evidence of podcast engagement as mobile learning activity also reinforces the iTunes U slogan: the university really is in the learners' pocket.

Publication 2 concluded by suggesting that there should be some form of accreditation of learning whilst keeping the resources open for everyone. This is the model that MOOC platforms such as FutureLearn have since developed. In many ways, iTunes

U was a precursor to MOOCs, providing massive access to free learning from well-known educational institutions.

Publication 3 used the whole cohort of respondents from the same survey and focused on mobile learning. It also focused more explicitly in the differences between internal / formal and external / informal learners and the differences between use of mobile and static devices to engage with podcasts. The fact that 23% of respondents who used static devices and 29.6% of respondents who used mobile devices were not formal learners allowed this research access to informal learners which, as discussed in the introduction, is a challenge for researchers. Very positive attitudes were recorded about the iTunes U podcasts, with over 98% claiming that the downloads helped them to learn, and a very high quality rating of 84.9% as either good or very good.

Another interesting result was the fact that 12.4% of respondents (10.4% in the case of language learners) used podcasts as their main source of learning about the subject they downloaded resources about, of which over 62% were mobile device users. This was a first indication in my research that some learners did not consider MALL resources a supplement to other learning.

Although the research was carried out using resources from only one institution, it is unlikely that the user profile for resources from other institutions would be very different, given that most respondents were not formal learners and appeared to be mainly curious to learn, picking and choosing resources that they found interesting and useful, in a similar manner to the way people use OER or MOOCs. iTunes U has delivered a wide range of freely-available resources from institutions that previously protected their content and it therefore was only available to a minority of the population. Because of the medium of delivery and the ease of access through mobile devices, listeners were not restricted by time, place or prohibitive costs.

The amount of storage on mobile devices has grown enormously since the publication of this research, and most devices would allow direct download into mobile devices nowadays. These two changes would affect the data collected at the time, as it is now highly likely that most podcasts would be accessed directly on a mobile device.

Apple announced in 2019 that iTunes U will cease to exist at the end of 2021 (Clover, 2020). The company had already removed iTunes from its main desktop store in 2017, leaving the standalone app as the only way to access iTunes U resources - podcasts in the majority - but also e-books and standalone courses, and only for Apple devices. Whilst podcasts will continue to be available from its *Podcasts* app, and educational content will be managed through apps such as *Classroom*, *Homework*, and the new *Apple School Manager*, the disappearance of iTunes U marks an end to free delivery of educational content in one place. It is not known whether institutions will continue to deliver the content they currently have on iTunes U through *Podcasts*, and the new educational management apps are aimed at schools that pay fees to use them, not autonomous learners. Without iTunes U, this type of research into autonomous use of academic podcasts in such large numbers will be hard to replicate.

The impact of this research into podcasting as a language teaching and learning tool has been wide and varied, and can be evidenced in a number of ways. In quantitative terms, the three publications on this subject have been cited a total of 422 times (as of July 2020), according to Google Scholar. In addition, two uploads of conference presentations based on this research have gained 643 views on Slideshare. In more qualitative terms, Publication 1 was used as an exemplar of the research approach centred on the investigation of the use of a generic (not designed for language learning) technology for its applicability to language learning by Stockwell (2012) and the taxonomy of podcasts for language learning was adapted by Hew (2009) into lecture podcast, supplementary podcast and student project. The results of the research have been used by many authors as a reference for discussion of podcasting for language learning in key CALL publications (Kukulska-Hulme & Shield, 2008; Levy, 2009; Stockwell, 2010; Alm, 2013; Pegrum, 2014). The research has also had impact outside the fields of SLA, CALL and MALL, with references from publications in a wide variety of subjects including blended learning (Ting, 2014), distance learning (White, 2017), educational design (Kirkwood & Price, 2012; Drew, 2017), music (Tam, 2012), physics (Lee, 2010), marketing (Woody, 2014) and law (Belgrove, 2009).

Technology II: Mobile applications for language learning

Despite a relatively large body of research into the use of apps for language learning, most of this research had focused on the use of a particular app in a specific context, with the vast majority of publications focusing on Higher Education students using apps to supplement formal learning. In addition, previous attempts at classifying apps and evaluate them had been written for use by teachers and researchers, not learners. Publication 4 aimed to review the research carried out up to that point and presented two tools to help develop an understanding of app-enabled language learning.

Being able to access a common language of reference in the academic discussion and evaluation of a pedagogical innovation is extremely useful, as is the classification of different resources into categories. For this reason, the first of these tools was a taxonomy of apps that can be used for language learning purposes. The taxonomy was presented both as a simple graphic and as a set of more thorough descriptions and examples for each of the three categories (apps designed for language learning purposes, apps not designed for language learning but useful to language learners, and dictionary and translation apps).

The second tool proposed in this publication was a framework for the evaluation of language learning apps. This was presented as four categories (Language learning, Pedagogy, User experience and Technology), with a set of criteria for each of the categories. The most innovative aspect of this framework was the fact that it was developed to be used primarily by learners as opposed to teachers, thus enabling both formal and autonomous learners to reflect on what an app provides and what it does not provide, with the potential for them to identify gaps in their knowledge and how best to fill them.

Publication 4 also proposed areas for further research in this field, including design and quality, user experience, the combination of several apps and resources, normalisation, and attainment. Publications 5 and 6 aimed at addressing some of these research questions, both with formal and non-formal learners.

As was the case with podcasting, most research carried out on the use of apps for language learning had focused on the evaluation of a single app by a specific group of formal learners at the behest of their instructor. The research presented in publication 5 explored the use of apps in a formal learning context in a different way: by asking learners if they used apps to support their learning, how, when, for how long, and their impressions of learning with them. The research utilised a mixed methods approach with both quantitative and qualitative tools, and was innovative as it also included participants who did not use apps for language learning, who provided information on why they did not engage with apps despite owning mobile devices. The quantitative survey gathered 85 participants and seven students volunteered for short interviews, which provided most of the qualitative data. The results showed that the type of apps participants used most were (in order of popularity) vocabulary, translation and grammar apps, whilst apps which enabled speaking practice and interaction with other learners or speakers of their target language were the least used. Most respondents used apps informally at convenient times, often, and in a variety of locations including their own home, whilst commuting, and during quick breaks at work, sometimes while doing other activities such as watching television. All respondents indicated that using apps had helped them to improve their learning of the target language to some degree. These results showed very different usage patterns from those found in previous research, most likely because using the apps had been motivated by the students' own initiative, and not because they had been asked to by an instructor or researcher. The conclusion called for research into the use of apps by autonomous learners, which was undertaken and reported in publication 6.

The introduction to this thesis highlighted the difficulties researchers have to gain access to autonomous learners. Since app developers can communicate with the users of their apps through in-app messages, this is one way to reach autonomous learners who use language learning apps. For the research published in publication 6, the developers of *busuu*, one of the most popular language learning apps, were approached. They agreed to send out the call for participants for the research as an in-app message to all *busuu* app (as opposed to website) users who were using English or Spanish as their language of instruction. The resulting data provided the first profile of truly autonomous language learners and previously-unavailable insights

into how they use the app, their most- and least-liked app features, their expectations and how they are met, and patterns of usage depending on the type of app user. The results supported some of the findings from previous research into the use of apps for language learning (including publication 5) and also contradicted some of the claims that had been made about app use in the past (e.g. that learners who studied with an app for personal interest were less likely to persevere in their use of the app, or that they used the app infrequently). The fact that 35% of respondents used the *busuu* app as their only tool to learn a language and the finding that over 10% of respondents used the app with the expectation to become fluent highlighted that some learners believe that language learning apps can be very effective tools for language acquisition, something that would have been highly unlikely only a few years ago.

One finding from this research that has seen development since its publication is the interest in some sort of certification of achievement for the learning that the users have undertaken, which is consistent with current trends in non-formal learning (Law, 2016) that were discussed in the introduction. Since the publication of the research, Duolingo have started to provide the Duolingo English Test, which provides level accreditation and is increasingly being accepted to fulfil entry level requirements to English-speaking universities for international students, although not without criticism (e.g. Wagner & Kunnan, 2015). This criticism, however, is based on the quality and variety of skill testing, not the delivery of the tuition or online assessment.

The impact of this research into the use of apps for language learning has been notable as it has generated a great amount of interest. Despite being published very recently (in 2016, 2017 and 2018 respectively), the publications have been cited over 100 times, and the three Slideshare uploads of conference presentations about this research have been cumulatively viewed 5364 times. In his review of smartphones for language learning purposes, Godwin-Jones (2017b), for example, highlighted many of the issues around app evaluation that Publication 4 discussed. Cervi-Wilson and Brick (2018) claimed that the evaluation framework presents “a robust set of criteria” (p. 57) for the evaluation of the app they developed. They also adopted the evaluation framework for teaching purposes in the MA in TESOL at Coventry University. The framework was adapted by Hashemi, Lindström, Bartram and Bradley (2017): they incorporated three of the four areas in the framework (Technology, Pedagogy and

Language Learning) and replaced User Experience with Culture to address the fact that their framework was primarily intended to evaluate apps for the purpose of integration. Their TPLC (Technology, Pedagogy, Language and Culture) model was used to evaluate a number of apps used by migrants arriving in Sweden and subsequently develop their own app. Matthews and Burke (2019) used the evaluation criteria for their own research into task-based language teaching with apps, and Tu, Zou and Zhang (2020) used it as the basis for their own evaluation framework of vocabulary apps. The results from the research published in publications 5 and 6 was used to inform the design of a vocabulary learning app by Kohnke, Zou and Zhang (2020), and Loewen et al (2019) used the data to compare the results with their own evaluation of the Duolingo app.

Technology III: Twitter as a language teaching and learning tool

Once again, my process of evaluation for this technology followed the pattern of identifying the potential for use for language learning purposes and the evidence gathered (publication 7) before carrying out my own research into the actual use of the technology by key stakeholders, in this case both language teachers (publication 8) and language learners (publication 9).

Publication 7 described the impact that Twitter has had since its launch in 2006 and, more specifically, its potential use for language learning purposes. This was summarised as a figure that classified the potential uses into input (linguistic and cultural), output (writing and speaking), and interaction. A review of studies into the use of Twitter and the evidence of language development found by a number of researchers followed, with the caveat that these studies focused mostly on teacher-directed activities in formal learning settings. I suggested that most learners are more likely to engage with Twitter for language learning purposes as an autonomous activity, and that this a) allows learner-centredness and b) is an area worthy of further research. The publication also suggested that the change in character length from 140 to 280 characters may lead to changes in the way that users utilise language on Twitter.

Unlike the rest of the research presented in this thesis, publication 8 focused on the experience of teachers rather than learners. Whereas podcasting is used by educators either as a source of material for their teaching (in or out of class) or by engaging in podcast creation, this is rarely something that involves learning new skills (other than technical know-how) for them. Similarly, the use of apps for autonomous language learning rarely involves teachers. However, teachers engage in autonomous continuous professional development through Twitter, and this made researching this practice relevant to the focus of this thesis. The research focused on three questions: providing a profile of #MFLTwitterati hashtag users, whether their practices contributed to Continuous Professional Development, and whether they could be considered a Community of Practice. The profile revealed that despite the world-wide use of Twitter, the vast majority of users were based in the UK. In addition, most users were female and taught more than one language. Their practices showed very positive perceptions of the benefits of using the hashtag and the resources, ideas and support they had found through it, as well as a positive effect on the users' teaching practice, with many reporting an improvement. Finally, the group was deemed to fit the description of a COP. Aside from the innovative methodology involved in the use of the Twitter Direct Messaging Protocol (as described in the methods section of the introduction), the integrated use of Twitter and Dropboxes was an innovative solution that had been previously unreported. The data also showed that, just like some autonomous learners wish to have their learning recognised, some of the teachers involved in the #MFLTwitterati hashtag wished to have this form of CPD recognised too.

Publication 9 shifted the focus back to learners. Despite a large body of research into the use of Twitter for language learning, with evidence of acquisition of vocabulary, improvement of pronunciation, interaction, and community building among others, this has mostly been limited to instances where an educator or researcher has instigated its use and measured outcomes in formal learning settings. This type of research did not capture the autonomous activity that many learners undertake on Twitter. With a large number of respondents (370 valid responses), of which over 70% were not formal learners, the data obtained from this research provided the first profile of the autonomous language learners who use Twitter and through it gain access to target language resources, native speakers and fellow learners. The research found that most users utilise a mobile device to access Twitter, which they use often and for short

periods of time. The participants reported learning vocabulary - focusing on both meaning and form - and information about the culture of the areas where their target language is spoken. Many of them, those with a higher language proficiency in particular, tweeted and interacted in the target language. The research shows that Twitter can be used as a mobile language learning tool that provides exposure to the target language and its culture as well as opportunities to produce output and interact with others, and this is embedded into their daily routine for many users.

Given that my research on Twitter as a language learning tool and as a tool to form a community of practice for language teachers has been published between 2018 and 2020, the number of citations to ascertain its impact (42) is relatively low – although considering the time it takes to publish an article in a peer-reviewed academic journal, it is likely that any later papers citing the research have not been published yet. The number of views for the two conference presentations uploaded to Slideshare show a high degree of interest in the research, however, with 8,954 views. Among the academic papers that cite this research, Kelly (2019) answered the call for more research into informal language learning on Twitter suggested in publication 7 in her own study of student interaction via Twitter. Based on the claim from the same publication that the change to 280 characters had the potential to change the way students express themselves on Twitter (e.g. fewer abbreviations and acronyms), Costa, Silva and Ribeiro (2019) carried out a research project to further investigate what kind of changes the doubling of character count had enabled. Palacios Hidalgo (2020) utilised the theoretical underpinning of publication 7 to propose a model for social media integration in Content-and Language-Integrated Learning, and Demiröz (2019) used it in her case for incorporating and combining technology and literature into language teaching to enhance creativity. The research into the use of hashtags as a medium to create a network and community of practice was used by Gomez-Vasquez and Romero-Hall (2020) for their own research into social media community around the #AcademicTwitter hashtag, and the design of Owens' (2020) survey tool for her research into the influence of Twitter among academic communities was informed by this research too. The final publication (9) included in this thesis is currently in print, so its impact cannot be measured in the shape of citations. The conference presentation about this research, however, has been viewed 1828 times on Slideshare.

Chapter 4: Conclusion

This final chapter first returns to the main topics and concepts presented in the introduction and provides some considerations based on the results of the research carried out. It then proposes that there may be a need to refocus the MALL research agenda and suggests directions that future developments may take. The chapter concludes with a reflection of the current pandemic and its impact on language learning and teaching through technology.

4.1 Considerations on the main themes and concepts

The introduction presented four main themes (CALL, MALL, Autonomous language learning and software evaluation) and six concepts that are relevant to research into language learning with the three technologies that are the focus of this research. These themes and concepts are reconsidered here in light of the results of the research carried out presented in this thesis.

4.1.1 Computer-Assisted Language Learning

The field of CALL continues to evolve as new devices, tools and affordances appear. As Gimeno-Sanz (2016) acknowledged, the disappearance of the CD-ROM as delivery medium for CALL packages led to the loss of the “all in one” package. As web-based resources grew in the late 90s, it seemed like CALL software developers had not encountered the wealth of research on these packages and good practice guidelines that emerged from that research. The tools that were developed were mostly based on the capabilities of the software rather than the pedagogical lessons learned in the late 80s and early 90s. Something similar happened with the development of mobile apps. Once again, it seemed like developers were basing their product on the technology and not the pedagogy. This is rapidly changing, and a positive aspect of the quick speed of software and device developments nowadays is that the shift towards more pedagogically-sound approaches to software development has been much faster than the transition from behaviouristic / Structural CALL to Communicative CALL, for example.

One aspect that much of the literature about CALL appears to ignore (perhaps because of researchers' focus on formal learning) is the fact that a shift has taken place in the way we communicate. CALL traditionally focused on preparing learners for interaction that took place without technology, but an increasingly large amount of the communication that people engage in now takes place through their smartphone. Computer-mediated communication used to belong in the context of business or education, but for many it is now the most commonly utilised method of interaction. This is something that research in the field of CALL needs to focus on, as interaction, the creation of output, and the comprehension of input, are mediated through technology, whether posting on social media, messaging, using apps, accessing audio-visual resources or gaming.

There has also been a change in the learners themselves: what technology they own, how they use it, how they socialise and in what (physical or online) environments, what they need to learn, how they prefer to learn it, and whether they want or need accreditation for their learning. As the results from the research have shown, an increasing number of learners believe that content and apps accessed through their mobile devices has language learning potential, and the learning context is more varied than ever before: "the arrival and widespread usage of smartphones and apps fundamentally altered the relation of people to learning in different contexts. The shift has become one of push to pull, from providers trying to encourage learners to use mobile learning approaches to learners expecting it" (Weller, 2020, p. 81).

4.1.2 Mobile-Assisted Language Learning

Based on the knowledge acquired through the different research projects, a new taxonomy of online tools and resources that can be accessed through mobile devices is presented below (Figure 25). Maintaining the format of establishing the two main categories of tools and resources as those that are designed for language learning and those which are not, the new taxonomy further develops the original work on podcasting resources and mobile apps and combines them to present the potential of MALL as a whole.

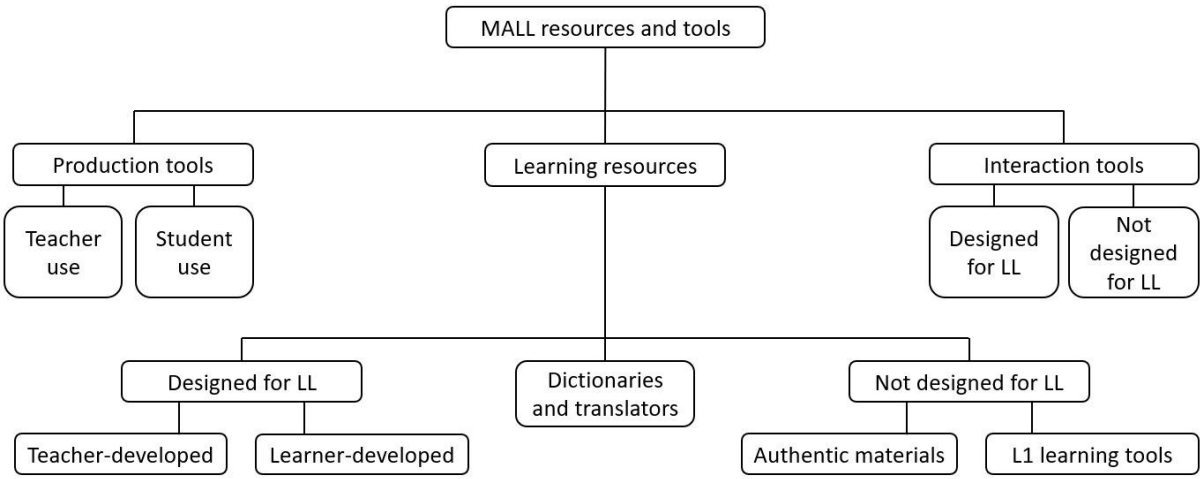

Figure 25: taxonomy of MALL resources and tools.

The taxonomy classifies resources and tools for Mobile-assisted Language Learning into three main categories: production tools, interaction tools, and learning resources. Some of these resources and tools have many affordances, so their use can overlap into more than one category within the taxonomy.

Production tools are those that learners can use to produce output. They include word processors, presentation software, audio and video recorders, social media and blogging and micro-blogging services.

Interaction tools are subdivided into those that are designed for language learning purposes and those that are not. Interaction tools designed for language learning can afford interaction with bots and with people (native speakers or fellow learners) such as Siri or Tandem. Those that are not designed for language learning purposes include audio and video conferencing tools, messaging apps, and more traditional asynchronous tools such as email, forums, comment facilities, and social networking sites.

Learning resources include dictionaries and translators, and resources and software either designed or not designed for language learning purposes. Resources designed for language learning purposes are subdivided into those that are developed by teachers / professionals, such as podcasts, apps or MOOCs (which in turn can focus on a specific skill, grammar item or vocabulary), and those developed by learners, including podcasts, YouTube videos, flashcards, and interactive activities created with

software such as Kahoot. Resources not specifically designed for language learning are subdivided into authentic materials (news services, streaming TV and video, podcasts, websites, games, social media) and tools designed for L1 learners to develop literacy skills (spelling, phonics, reading).

4.1.3 Autonomous Language Learning

The research presented in this thesis has produced evidence that autonomous learners engage with language learning tools such as podcasts or apps in a way that is different from learners in formal settings, and for different reasons. The data also shows that a large number of autonomous learners are no longer in education and they undertake language learning for reasons other than passing a course or obtaining a qualification (mainly personal and work reasons). Most of the research published into autonomous language learning and MALL inevitably mentions the teacher's role as someone who can foster autonomous language learning as part of tuition. It is also the case that most research papers on podcasting, apps and the use of twitter as language learning tools conclude that these are very good supplements to formal tuition. Both these facts reveal that researchers presume an element of formality and teacher involvement in the language learning process. But these so-called supplements can be put together to make a whole language learning experience completely separate from formal tuition. There are many language learners who do not engage in formal learning, do not wish for any sort of accreditation, and create a personal learning environment for themselves out of the different tools available, selecting what works for them to achieve their goal. This goal is not dictated by a curriculum, board of studies or education agency. It is individual to each learner and their needs. For example, a learner who wishes to engage in conversation with the family of their loved one will not need to write a formal text, a learner who studies a language to engage with its literature may not want to learn how what they read is pronounced.

The process of creating one's own personal learning environment, however, involves trying out different tools and resources. This can be a frustrating experience, where expectations may not be met. Furthermore, a learner may not be aware of what they need to achieve their learning goal, or maintain momentum and keep challenging

themselves. In the case of apps, for example, it is very easy to be contented by the rewards and small achievements of vocabulary development or grammar drills without stopping to think about whether those steps are heading in the right direction to achieve the goal. The research on the use of the *busuu* app, for example, found that the most popular reasons for using the app was to develop speaking skills, yet this was not high among the areas that users reported to have developed despite claiming that they were satisfied with the app. This is consistent with previous findings by Gimeno-Sanz, Morgana and Van de Vyver (2020).

Something that all learners have in common is that – in most contexts – they will have been schooled for a number of years. It is during this time that the value of autonomous learning and learning how to become a good autonomous learner need to be developed as a life-long skill. To support such an undertaking, Figure 26 presents a technology selection process for autonomous language learning which consists of five steps. The first step is for the learner to identify their language learning needs: "what do I need to learn?". The second step is to identify the tools: "which tools can help me meet those needs?". The third step is to use the tools, after which the fourth and fifth steps involve considering the effort and time on task spent using the tool and whether this was well spent with regards to the needs fulfilled.

Figure 26: autonomous language learning technology selection process.

Returning to the definition of fully autonomous language learning as "informal language learning that takes place in digital spaces, communities, and networks that are independent of formal instructional contexts" (Sauro & Zourou, 2017, p. 186), it is important to make a case for this area of language learning to be further investigated. Fully autonomous language learning remains an area of great interest, yet under-researched. One of the reasons why fully autonomous learning is the focus of fewer research studies is access to learners. Since mobile devices are widely owned and

provide so many opportunities to engage in language learning activity, it is through these devices that the opportunities to gain access to them arise. Research methods in autonomous language learning should include mobile devices as tools for research, allowing a digital ethnographic approach integrating the research tool into the learning experience.

Furthermore, given the methodological differences between the study of formal and fully autonomous language learning, it is worth considering whether fully autonomous use of MALL resources should be considered a parallel field in CALL.

4.1.4 Evaluating technology for Language Learning purposes

The purpose of the research carried out and reported in chapter 2 was ultimately to evaluate the use of the three technologies for language learning purposes. Publication 5 presented an evaluation framework for language learning apps, and this framework has been used and adapted by others, as discussed in chapter 3. The use of the framework does not have to be restricted to mobile apps, however. Figure 27 presents a revised overview of the framework in which *interaction* has been extracted from the user experience criterion and given a category of its own due to its importance in the language learning experience and the fact that each of the criteria can be affected by it. The five criteria are therefore Technology, User experience, Language Learning, Interaction and Pedagogy, or TULLIP.

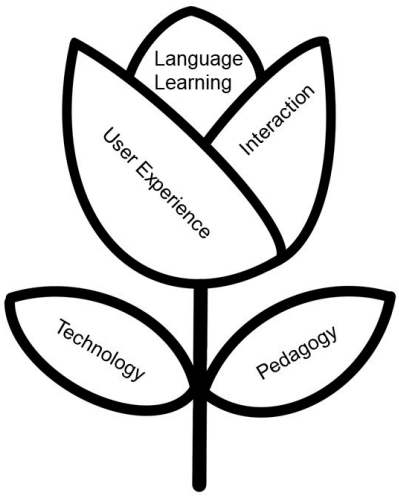

Figure 27: TULLIP at a glance.

In Figure 28, the full set of criteria is presented with each of its components. The interaction criterion has been separated into five possible types of interaction: with native speakers, non-native speakers (who may be learners too), educators, institutions and artificial intelligence (chatbots or voice assistants, for example). This revised framework could potentially be used to evaluate any technology that can be used for language learning purposes, whether designed for it or not.

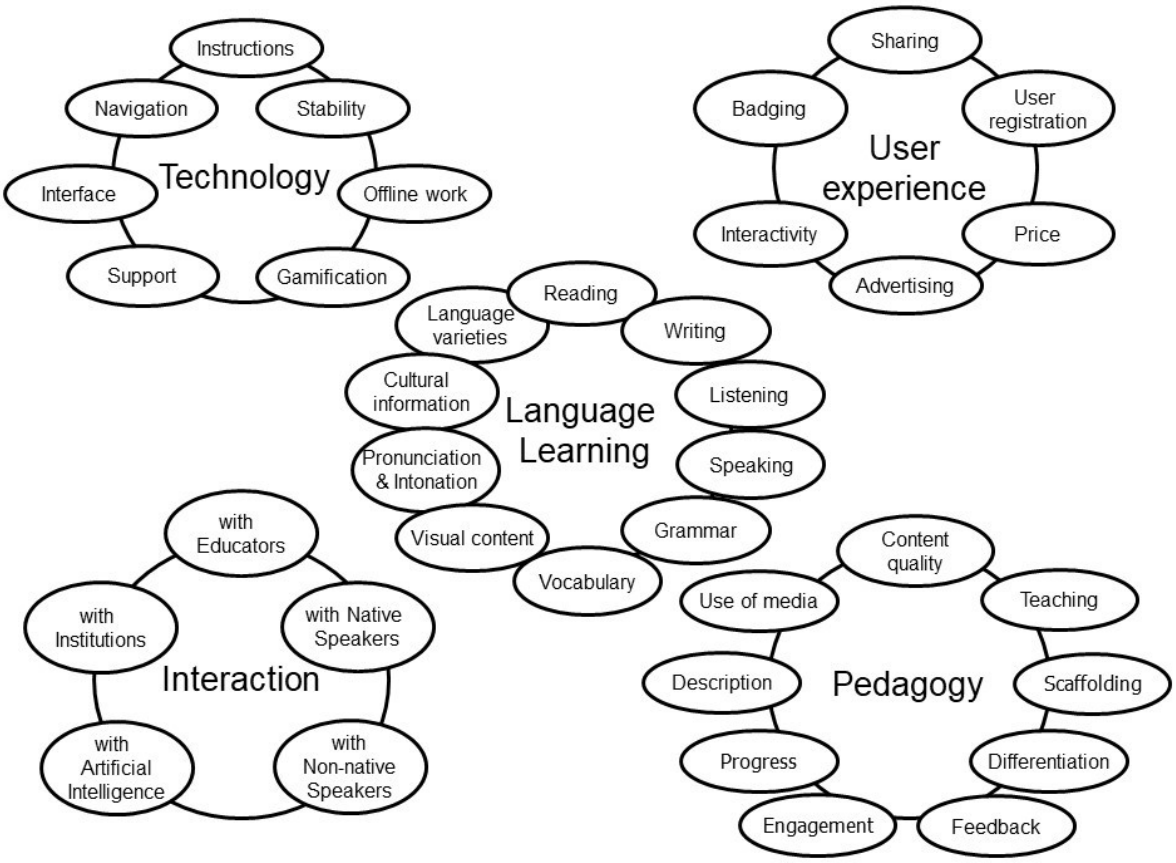

Figure 28: the full language learning technology evaluation framework.

The framework can be used as part of a more complex evaluation process which starts with identifying the potential for language learning of a given technology (or combination thereof) based on the outcomes of engaging both with the TULLIP framework and with any evidence of language learning use available either anecdotally or as the outcome of previous research. The next stage of the process is to investigate how learners use the technology. For this, the process involves profiling the learner (formal or informal), how they use the technology, and whether learning

takes place. This can be based on learner beliefs about learning with the technology as well as empirical evidence. The process is illustrated in figure 29.

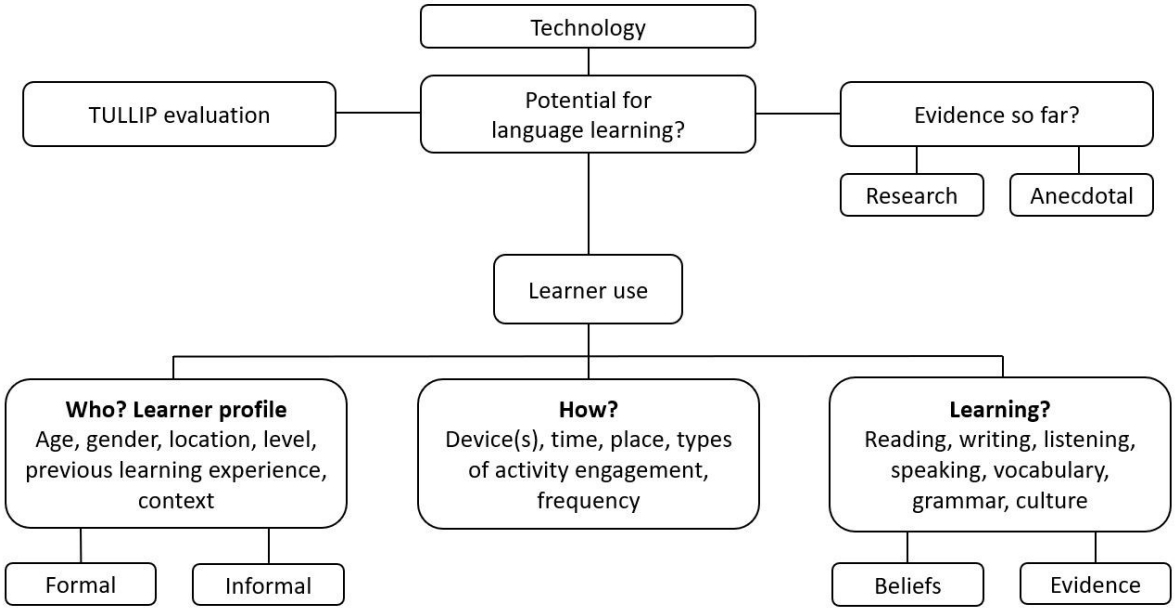

Figure 29: process of evaluation of new technologies with potential language learning use.

4.1.5 The six useful concepts

This section briefly returns to each of the six concepts presented in the introduction.

I teaching strangers

It is very likely that there are as many, if not more, autonomous language learners as there are formal learners, as the millions of language learning apps users suggests. These users do not have much in common other than owning a mobile device and wanting to use it to learn a language. To customise their learning experience, learners will try different tools and use technologies in ways that may not be what their designers conceived them for. It is because of this that the importance of profiling users and their experiences with technology cannot be understated and should be high on the MALL agenda, particularly in the case of fully autonomous learners. There will be always an element of uncertainty when designing materials for strangers, but the more that is known, the better the learning experience will be.

For this, establishing who the audience is and what they do with technology for language learning purposes should be embedded into the design of open initiatives and inform future iterations. Teaching strangers presents a number of challenges in terms of design, pedagogical approach, and accessibility. The materials and design should be as flexible as possible to enable as many types of learner to benefit from it. In order to achieve this, developers should tag language learning materials according to level and describe them as accurately as possible, a practice that is not as common as it should be.

II Digital capabilities

The ability of learners to find, use and evaluate learning resources and tools is often taken for granted, but as the data from app non-users in publication 5 revealed, this is not always the case. Training is rarely provided for self-directed learning out of the classroom context, let alone full autonomy. As stated above, something that the vast majority of learners will have in common is the fact that they will have a number of years of schooling. It is at this time that digital capabilities need to be embedded in the curriculum, not just as a set of abilities to undertake a number of tasks with certain tools, but to enable them to become autonomous learners after formal education. Yet, as most educational systems do not teach the value of autonomy or how to be autonomous, learners have to learn both of these for themselves.

Autonomous learners make choices to devise their own learning environment, with a range of tools and resources for language learning. Pegrum (2014), referred to apps as walled gardens isolated from each other and the wider web “leading to a learning landscape populated by individually purchased, independently used, standalone apps training limited sets of knowledge or skills.” (Reinders & Pegrum, 2017, p. 2). Without guidance and training, learners may simply undertake a number of activities without considering how these activities fit into a larger plan, or do what they find rewarding, not what they need, which in turn can lead to an unintended imbalance of skills. If young learners are taught to take control of their learning and question what they do (following a process similar to the one presented in Figure 26) then they will be prepared for life-long learning in and outside of formal education.

III Micro-credentialing

As autonomous language learners undertake informal learning opportunities, the research found that there is a growing call for their learning to be recognised. This also applied to teachers engaging in CPD. Micro-credentialing acts as a form of accreditation of learning experience, but this can lead to quite a fragmented system, where badges are located across a number of platforms and cannot be showcased in a single place. This could be changed with a wider adoption of personal learning environments (PLEs). The PLE concept is in many ways an evolution of the e-portfolio but not restricted to one platform or institution. E-portfolios “can be an effective means to document both personal achievements and learning trajectories” (Godwin-Jones, 2011, p. 4), and they “serve a variety of purposes: personal, educational and vocational” (ibid). PLEs “allow learners to make decisions about how to choose tools and configure the learning environment to best suit their learning goals and needs for networking, knowledge construction, social interaction and collaboration” (McLoughlin & Lee, 2010, p. 31). The wider adoption of PLEs may also address the issue of accreditation of informal learning activity, something that employers continue to demand.

IV Continuous partial attention

The data from this research found ample evidence of technology users engaging in other activities whilst undertaking learning activities on their mobile devices. This is further supported by anecdotal evidence of multitasking whilst engaging with social media (Rosell-Aguilar, 2018d). Some might argue that most of us are affected by CPA to some degree, but further research needs to be undertaken to ascertain how CPA affects the learning experience on mobile devices.

It is not uncommon to pick up a smartphone or tablet with the intention of doing something and be distracted by games or social media. Even whilst taking part in an educational activity, notifications from messaging, updates, news... can affect concentration or make the user pause or quit the learning activity altogether. The fact that the tool that provides a learning environment is also a source of distraction and procrastination creates the need to be determined when undertaking a learning

activity. Most mobile devices provide a summary of activity (hours of use, type of app used), and this is a tool that may be worth exploring as a possible source of help in maintaining concentration.

V Foreign language anxiety

The data from the research has provided evidence that foreign language anxiety also affects learners whilst using mobile devices. For example, there were instances of learners stating that they would not submit their output to be reviewed by a native speaker within the *busuu* app, and others saying that they do not tweet in their target language as they do not want to make mistakes in public. These, however, were very few in proportion to the numbers of users who took part in the various research projects.

There is no doubt that apps provide safe spaces where learners can test their grammar without anxiety about making mistakes in public, and this should help minimise anxiety and hopefully increase learners' confidence to produce output. This may enable learners to reduce their anxiety in other mobile-mediated environments such as texting. Whether gaining confidence in understanding input through podcasting, or producing output through the use of apps or by successfully tweeting in the target language, affects anxiety in other contexts where the learner has to produce output more spontaneously remains an area worthy of further research.

VI Normalisation

When it comes to learning using a mobile device, the research presented in this thesis has shown that those who use it as a language learning or practice tool are able to find resources, use them and complete learning activities successfully. Learners do not appear to have any problems finding podcasts they consider useful. Apps are mostly intuitive, with good design and their use is normalised. There is evidence of expectations that one can learn with them and even become fluent. Users do not have any concerns about how to use smartphones, and they are normalised for those that use them regularly. There was also evidence of language learners who did not realise some of the ways in which they can use their mobile device as a learning tool, and

although the device is normalised for these learners, learning with it is not. This supports the case for teaching pupils in schools how to make the most of their devices for out-of-class learning, and eventually life-long learning.

Stephen Bax, who wrote extensively about normalisation in the context of language learning technologies, often used his spectacles as an example of a normalised technology. He would point out that spectacle users often forget that they have their glasses on and cannot particularly remember putting them on, and therefore they are a completely normalised technology for them. Just like people who are new to wearing glasses need an adaptation period when they are acutely aware of wearing them or may find them uncomfortable, once learners realise the potential and try different mobile language learning activities, the use of their mobile device is soon adopted and normalised.

4.2 A new MALL research agenda?

The previous section presented a revised framework for technology and software evaluation as well as a suggested process to follow, focusing on the learner experience of using the tools and software they have at their disposal. Evaluation of learning innovations for language learning has for a long time focused on measurable student success. This has led to studies that used statistically-significant increases in attainment to provide proof of learning. However, those studies tend to be so specific to a particular student population in a specific formal learning context that they are almost anecdotal, rarely replicable, and barely generalisable: “studying variables in isolation can be informative but may convey a cause-and-effect impression that belies the interdependence of individual traits, social interactions, institutional forces, socio-economic factors, and political or power relations” (Godwin-Jones, 2019, p. 18). The way that software is used nowadays does not allow for accurate measurement of language acquisition. Learning using mobile devices is very rarely done in isolation - using a single piece of software - anymore. A consequence of this is that to evaluate the use of a single piece of software would require learners to stop using every other resource they utilise for learning, something that – even if it were possible – may be

at odds with the aim of teaching and learning as opposed to research. There are too many factors and variables at play.

In the last few years, CALL has experienced a shift towards a personalised, learner-centred experience of learning with mobile devices whose software is generally intuitive to use rarely provide instructions. Learners have normalised the use of the smartphone as a learning tool and – in the context of fully autonomous learning in particular, but also in other contexts – the role of the teacher has been minimised. In this phase of Atomised CALL – where learning is based on the use of unstructured meaningful resources – it is the learner who constructs knowledge through their personal learning environment and (when this is done with others) the result is a technology-enabled socio-constructivist learning process.

In this context, the traditional approach to measuring success is not suitable. Because learning is the sum of the different micro-activities using “atoms”, it is not possible to predict how much users will learn, or - most importantly - if everyone who uses it will learn. Those traditional methods for technology evaluation within the field of CALL were designed for single-solution environments (e.g. CD-ROMs) that were used in isolation. The rate at which technologies appear and are updated or replaced by an improved version adds a further hurdle to evaluating a particular piece of software, and merits questioning whether this is a worthwhile endeavour: “What is the value of running detailed educational evaluations of a prototype mobile learning system implemented on last-year’s handheld technology?” (Sharples, 2013, p. 5).

It is extremely likely that any engagement with technologies that afford the learner opportunities to acquire vocabulary, learn grammar, notice salient aspects of language, focus on form, access target language materials and engage in several types of communication with others (as the research carried out has demonstrated) will provide some degree of improvement in language skills. If we can agree that this is the case, then – in addition to profiling the learners – the efforts of the MALL research agenda should focus on identifying the potential for learning of new technologies and then examining the learners’ (and in some cases the teachers’) experience of using those technologies. In the formal learning context, this will allow instructors to make informed decisions on whether the learners’ time is well spent

using these. Evaluation in CALL and MALL has mostly been carried out by researchers / experts / teachers but not learners - whose role has been that of participants, giving opinions, being tested, but not carrying out the evaluation themselves. We need to hand evaluation to the learner: guide them, teach them to find and select resources, to identify the potential of those technologies according to their needs, to be critical and make the most of the affordances of the tools available; encourage them to challenge themselves out of their comfort zone.

For this purpose, an evaluation framework has been provided and a process outlined above. Other activities to support the learner include teaching best practice for language learning. An example of this is the *How to Learn a Language* Badged Open Course (Beaven, Rosell-Aguilar & Richards, 2018), which covers motivation, goal-setting, awareness of the different areas to master (e.g. linguistic, cultural, methodological), finding and evaluating language learning resources, support networks, and establishing a routine among other subjects.

4.3 What next?

A common denominator in many science fiction films of the 1970s, 80s and 90s was that computers would be at the centre of human life. These envisioned futures, from films such as *2001: a Space Odyssey*, *The Terminator*, *Blade Runner*, or *The Matrix*, presented very advanced computers which in one way or another would attempt to control humankind and present a danger to it. Whilst we are now dependent on technology for many of our day-to-day activities and some might argue that many people are addicted to their smartphones (or rather the people and content that we can access through them), our present is - thankfully - not the dystopian future that these films portrayed. The computers that we use most often for most technology-enabled activity are not enormous metal machines that occupy entire rooms, but small devices we carry in our pockets. Predicting the future is not easy. We can, however, make educated guesses as to the developments can we expect in the field of mobile-assisted language learning in the near future. These can be divided into technological developments and developments in teaching and learning practices.

4.3.1: Technological developments

Technological developments that are currently taking place include the enormous improvement in automatic speech recognition (ASR) software that has taken place in the last few years. ASR software converts voice output into text, which makes it an ideal tool for anxiety-free pronunciation practice. Although ASR is intended as a tool for native speakers of the language, a likely development will be the evolution of this type of software as a language learning tool with the ability to provide feedback on pronunciation errors and teaching pronunciation that is closer to the native speaker model.

Another technological development that is gaining popularity is the use of voice interaction assistants such as Siri and Alexa. Their use in language learning is still in its infancy, but there are clear use strategies that can be implemented such as testing the quality of output in the target language by the assistant's level of understanding, and testing input comprehension of what the assistant says. In addition, these assistants can provide the learner with voice-activated access to dictionaries and translators. The level of interaction with voice assistants is limited: it is a question-answer format that does not simulate real conversation, but this may well be a development in the short-term future.

Linked to this is the use of artificial intelligence and bots that simulate natural intelligent communication using text or speech technologies. These can be programmed to carry out conversations on specific topics. The Duolingo app tested their use in 2018 and, although currently discontinued, they are likely to become more sophisticated and popular.

The three technological developments listed above can be categorised as plausible or likely developments. A further development that is perhaps less likely but desirable is the development of a language learning dashboard app. In the conclusion of Publication 6 on the use of the *busuu* app, I remarked that many of its users wished for an all-in-one solution and suggested that a possible solution to this would be a single dashboard app that incorporated and tracked achievements from other apps into a single environment. This app would provide a personal learning environment

customisable for each learner's goals and needs. As well as tracking activity carried out using language learning apps such as Duolingo or *busuu*, the dashboard could record activity such as accessing text resources, podcasts and YouTube videos in the target language or interaction through synchronous communication software or social media. Settings in the app could set a minimum amount of weekly activity across different tools. This would help the learner ensure that they are not only doing the activities they find easy or rewarding, but also other activities that they need to focus on and challenge themselves with. In addition, the app could use a feedback system and recommendation algorithms to suggest activities that other learners have found useful depending on each learner's settings.

4.3.2: Developments in teaching and learning practices

Developments in teaching and learning practice are likely to become even more divergent in the contexts of formal and informal learning. There is a possibility that formal qualifications in a given language may become a more niche requirement, and employers will require practical knowledge of a language rather than formal accreditation. Given that integrative motivation continues to be a very common reason for language learning, learners whose motivation to learn is not instrumental may not see the need for accreditation either. This would lead to a growth in autonomous and non-accredited language learning.

Should this be the case, MOOCs and apps will likely become the main source of language learning for many. Developers will therefore need to ensure that the learning experience in these environments is improved, with task design that takes principles of distance language learning as well as the devices used to learn, into consideration. This will involve the provision of more scaffolded activities, linked to grammar teaching and opportunities for interaction as well as meaningful feedback.

In this scenario, the issue of cost and pricing is unlikely to remain at the current impasse, where learners expect apps and courses to be free but providers need to recoup costs and generate income. Linked to this, it is possible that the future may see less choice and fewer specific products, with the least popular (not necessarily the least effective) providers no longer able to support their business model.

Another development that may take place is the reduction in publicly-funded language learning technological development. Currently, a large amount of work and resource, funded by EU for example, goes into developing apps, MOOCs, OERs and other initiatives to practice a specific skill, for a specific context, with a specific set of learners. These are usually built, evaluated by researchers with their target audience, and then fall into disuse as there are no funds to publicise their existence or make them sustainable. The trend is likely to continue towards the funding of initiatives to promote language learning in general and specific pedagogical approaches, rather than the development of materials.

In terms of research into the use of mobile devices for autonomous language learning, access to learners to evaluate their learning initiatives will continue to be difficult unless links are established with commercial developers to gain access to the learners that utilise their services.

Finally, one trend that will continue to grow is that language use will be mediated by technology. Based on this, one desirable change would be the realisation and acceptance by formal educational institutions (schools, further education and higher education) that language use occurs through the medium of technology, and that therefore learners need to be taught to use and exploit their devices for language learning. Classroom-based language teaching continues to focus on practice for situations that take place using traditional methods of communication (situations such as booking a hotel room by speaking to someone, something that rarely happens anymore) and not only does current practice not exploit the smartphone as a means of learning but forbids its use in many cases. The smartphone (or tablet) must enter the classroom and learners must be taught how to use it appropriately for learning purposes in and out of formal education. It affords learning that is personalised in terms of content, pace and location in a way that was previously unavailable. In a context where smartphone ownership is commonplace, it is imperative that these opportunities are seized upon.

4.4 Post-script commentary: The New Normal

“There's a special providence in the fall of a sparrow. If it be now, 'tis not to come. If it be not to come, it will be now. If it be not now, yet it will come—the readiness is all”. William Shakespeare – Hamlet (Act 5, Scene 2)

As the Coronavirus pandemic extended from east to west in the last few months, many countries imposed a lockdown and their educational institutions shut their doors. In this situation, the obvious decision was to move teaching online. Most schools, colleges and universities have a virtual learning environment, but despite the many collaborative tools that VLEs offer, many institutions had been using them merely as a place to publish timetables, class materials, and links to supplementary resources, not as teaching spaces. At best, their “online learning” practice was to ask students to undertake some sort of individual activity online to inform what happened in the face to face classroom, using a flipped learning approach.

One consequence of the Covid-19 lockdown was a considerable rise in the use of synchronous computer-mediated communication technologies for work and leisure purposes. Almost overnight, videoconferencing (*Zoom*, *Skype*, *Facetime*, *WhatsApp video*) became the essential tool for staying in touch with family and friends, leading to an enormous acceleration in the normalisation process of this type of technology. From children to grandparents, meeting online became “The New Normal”. However, knowing how to use a technology for a work meeting or hosting a quiz night does not equal knowing how to use it for pedagogical purposes. The directive from management to move all teaching online meant that teachers who had never taught a lesson outside a physical classroom had to learn how to use SCMC tools such as *Blackboard Collaborate*, *Adobe Connect* or *Big Blue Button* for live sessions with students. In many cases, institutions provided some instructions on how to use the technology, but little or no training on best pedagogical practice in such environments. As a consequence, many teachers turned to social media to find how best to use these tools, leading to hashtags such as #onlinepivot and #onlinelearning becoming very popular in educators’ timelines.

It is often assumed that students own a laptop or computer and have an internet connection, but many institutions found that their students did not own such devices. Instead, the students tend to use the many pieces of equipment and wi-fi available on campus, and their primary device is a smartphone and the limited data available on their phone contracts. This had an unforeseen impact on what software they could use and for how long. In the case of schoolchildren, it was a common situation for their family to have one computer or laptop, meaning that it had to be shared by everyone in the household for work, schooling, and leisure activities.

There has also been a number of cases of university students asking for refunds on their fees, claiming that online teaching was no substitute for face-to-face. So far none of the institutions involved in such cases have provided any refunds and they have made the point that their courses' learning outcomes were being met. What this situation has highlighted is that many people consider online learning to be of lesser value, or second best, and how unprepared schools and universities were for fully online learning. This only places more importance on staff training and management of student expectations, as well as on raising awareness of the value of online learning.

In these uncertain times, nobody knows how long restrictions related to Covid-19 will be in place for, or when the next pandemic will come. It is too soon to tell how the lockdown teaching experience will affect tutorial provision in schools or Higher Education. It is unlikely that schools will adopt it in the long term as they provide a social role and allow parents to go to work, but HE institutions now have evidence that their teachers and students can, for the most part, adapt to the online environment. This rise in online teaching may well lead to an increase in blended or full distance learning from institutions that did not provide such options. A possible consequence of this is that distance learning institutions may lose their uniqueness and find their position threatened by other providers.

At this time of need, social media has provided an environment for just-in-time professional development, with many online learning practitioners providing advice and support for those who were new to it. Technology has proven robust enough to serve the purposes of a much higher number of students than previously planned. This situation has shone a light in the knowledge gap in online pedagogy for many,

however. Training teachers to teach online has long been advocated, but it is now a necessity. This must be reflected in the curricula of teacher training programmes. The readiness is all.

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