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Mobile Informal Language Learning: Exploring Welsh Learners' Practices

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Mobile devices have great potential in supporting language learning, through providing access to vocabulary, lessons and resources, and supporting interactions with other speakers. There may be particular advantages, however, in using such technologies for learning minority languages.

Welsh is a minority UK language spoken by around 611,000 people in Wales and there is considerable interest among adults in Wales and from Welsh families in learning Welsh. However the small numbers of speakers and their uneven distribution make it difficult for learners outside Welsh speaking "hotspots" to hear and practice Welsh.

Mobile learning therefore has great potential for Welsh learners by providing resources wherever the learner is and by supporting web-based learning communities. The study reported here investigates whether this potential is being exploited in practice. It employed interviews and a small survey to study the practices of Welsh learners at all levels. It was found that learners used mobile technologies widely, to access a wide range of resources, although not always on-the-move, and also that many were using courses, in particular one online course. Learners' practices in using digital technologies for their Welsh language learning are discussed, and also the implications for both learning other minority languages and for informal mobile learning more generally.

Tags

informal language learning,
mobile, Welsh

1. Introduction

Language learning often takes place over a long period and encompasses both formal and informal approaches as learners seek to maximise their exposure to their target language. Over a period of time, language learners may well study different kinds of courses, including traditional 'classroom' courses, self-study courses and online courses. More recently these offerings have been added to by language learning apps e.g. Busuu and Duolingo which often involve communities of learning and can be accessed online and/or downloaded on to mobile devices such as smartphones or tablets, as well as numerous other language learning resources available via websites.

In recent years there has been increasing interest from researchers and teachers in how mobile devices can support language learning (see, e.g. Godwin-Jones, 2011 and Kukulska-Hulme, Norris and Donoghue, 2015) This paper considers how digital technologies, in particular mobile technologies have the potential to support informal language learning practices, focusing on a case study of Welsh, a minority UK language.

Welsh is a regional minority language in Britain, spoken by around 611,000 speakers. Wales has 3 million residents and currently Welsh, once spoken widely across Wales, is now only spoken by around a fifth of the Welsh population, and so is a minority language that is considered endangered by UNESCO. For some learners Welsh may be a heritage language: it has been spoken by previous generations in their family, and so learners may have some familiarity with it. However, with a small number of widely distributed speakers it can be difficult for learners to hear and practice Welsh. Hence, for learning Welsh, digital resources, which can help learners to transcend geographical limitations, may be particularly important. In this paper the focus is on the use of technological resources, particularly mobile devices, to support self-directed Welsh learning.

There is currently considerable interest in endangered and minority languages. Indeed it has been argued that the loss of language diversity is as problematic as the loss of species diversity (Turin 2012), as languages carry with them important cultural and social knowledge (e.g. the uses of plants for medicinal purposes can often be inferred from their names). Although the paper focuses specifically on a study of practices in learning Welsh, the implications for other minority languages are considered in the discussion section, as are the implications for informal mobile language learning more generally.

2. Informal language learning with mobile technologies

Although there are different definitions and understandings about informal learning in the literature, (Jones, Blake and Petrou, 2011) for the purpose of this paper informal learning is viewed as learning that takes place outside an institution (such as a school, college or university); without a teacher and without that learning being assessed. In recent years it has been argued that the distinction between different types of learning (e.g. formal, semi-formal and informal) is breaking down in many areas, not just in language learning and that mobile devices such as smartphones may bridge this gap and support continuity between formal and informal learning (see, e.g. Cook, Pachler and Bradley (2008). There has also been an increase in research into mobile informal learning more generally and Sharples (2013) reviews this research and practice and also notes the challenges. In the specific area of language learning, Lai and Gu (2011) note that “successful language learners often attribute

their achievements in language learning to active engagement with the target language beyond the classroom” (p.318).

Mobile devices can support learners in their language learning endeavour by providing access to resources wherever the learner happens to be. Such language engagement might include, for example, using chunks of spare time for practice or looking up vocabulary in relevant contexts or interactions on social media.

Literature on mobile-assisted language learning has largely been dominated by accounts of project implementations, pilots and trials, as noted by Burston (2013), mainly within formal education settings. Recently there has been increasing interest in understanding how students create personalized learning experiences outside the classroom and how they experience mobile learning (e.g. Kim, Rueckert, Kim and Seo, 2013; Gikas and Grant, 2013). This is in part because of an increasing recognition of the extent of informal language learning and its importance: for example a positive association between informal learning and language gain is reported by Gan, Humphries and Hamp-Lyons, (2004).

One line of research has investigated how mobile language learning might supplement and augment classroom based learning, often focusing on learning English. For example Chen and Li (2010) developed a Personalised Context-Aware Ubiquitous Language System (PCULS) to teach English vocabulary to high school students. They report that using context-aware techniques tailored to the learning environment and content to support memorising English vocabulary via mobile devices was successful in improving English vocabulary. Researchers have also reported on mobile blogging as an out of class activity, e.g., to support the L2 English cultural and linguistic integration of Chinese university students in the UK (Shao, 2011) and to connect up L2 Spanish learners visiting Spain, allowing them to share experiences with other students on the same UK course (Comas-Quinn, Mardomingo, and Valentine, 2009).

Studies have begun to emerge reporting research into learners’ own self-directed practices with technology. For example, in a study cited by Lai and Gu (op. cit.), Zhang (2010) investigated Chinese EFL learners’ use of technology for language learning and found that although her learners made limited use of technology for their language learning, songs and films were used most and Web 2.0 resources least. Lai and Gu’s investigation of learners’ technology use found that students used technologies more outside the classroom than inside. The students used

a variety of technologies and their use included monitoring and evaluating their learning, increasing their motivation and seeking help from native speakers. However, Lai and Gu do not report on the extent to which mobile technologies were used.

A recent empirical study in the UK reported on the emerging mobile learning practices of adult distance language learners, across both formal and informal settings, who were learning a range of languages independently (Demouy et. al., In Press). It included a large survey which focused on the students' current practices and behaviours. The most frequent activities were watching videos and listening to the target language whilst the most popular resources and apps included reference material such as dictionaries and online translation tools. Language learning websites and apps, authentic audio-visual and reading resources were also frequently used by the students. Mobile devices were used for language learning both in planned sessions and spontaneously and most students believed that their mobile devices allowed them to study at times and in places that they otherwise would not have done. One reason these students used their mobiles was to use small gaps in their schedules, which would otherwise be 'dead' time. This might include daily commutes or lunchtimes at work, and it added to the time available for their language learning.

The EU funded [MASELTOV](http://www.maseltov.eu) project (www.maseltov.eu, 2012-2015) developed services and apps, collectively known as MApp, on smartphones to help support immigrants' integration into their new European cities. One of the MApp tools consisted of English language lessons to support informal and incidental learning in context. Additionally a forum provided social support and a place for peer comment and practice. These tools were used in a field trial in a UK city, Milton Keynes, by 17 participants from Spanish speaking South American countries. Results indicated that the language lessons on the smartphone supported the participants' English language learning by being available when needed; enabling vocabulary look up, help with phrases of personal interest and practice of different skills – in particular reading, listening, speaking and supporting particular situations: e.g. going to the doctor's, making bank transactions or catching a bus. Further details of the findings can be found [here](#).

As Gaved, Greenwood and Peasgood (2015) note, MApp works best where there is a high quality network connectivity – and this is not always available when mobile learners are out and about. A recent project, SALSA (Sensors and Apps for Languages

in Smart Areas) has therefore been investigating the provision of location-specific language learning activities in the context of a smart city, that does not require such connectivity but uses Bluetooth beacons, see Gaved, Greenwood and Peasgood (op. cit.)

These studies indicate the potential of mobile informal learning and some report on the positive benefits of having language learning tools available anywhere so that learners can use them as they go about their daily lives. However, as noted, most studies report trials of apps or software developed for particular projects, and often connected to formal language courses. There is still a paucity of research into learners' independent practices in pursuing their informal language learning. In the context of Welsh, as argued above, digital resources, especially when mobile, have the potential to at least partly overcome the particular challenges of learning a language with a limited number of dispersed speakers. Such challenges are also likely to apply to other minority languages. The next section considers the literature on learning Welsh and the resources available to Welsh learners.

3. The Welsh learning context and resources for Welsh learners

The literature on learning Welsh is relatively sparse. Baker et al. (2011) provide the context on formal adult education provision for Welsh learners in Wales and report on the rise in Welsh learners at adult Welsh centres in Wales, as well as their motivations and expectations. Trosset (1986) reports on an early study of Welsh learners, which unusually took an ethnographic approach and argued for the social nature of language learning: "... to learn a language is to enter a community of people who speak it. There are many aspects of language learning that exist not in the cognitive processes of learners, but in the social relationships developed between the learners and the members of the speech community which they seek to enter." (Trosset, 1986: 165.)

Despite massive growth in online language courses and apps, few include Welsh. One that does and which is a notable success in terms of the number of learners is [SSIW](#) (Say Something In Welsh) with 30,000 participants having signed up for courses. It includes:

- Three online courses (so far) with conversation-based lessons

- A forum
- A weekly newsletter
- An online Eisteddfod (a Welsh festival of literature, music and performance)
- “Bootcamps” where learners meet up face to face for intensive speaking practice
- Local meetings

SSIW is a hybrid online/offline language course and community. As learners are largely based in one country, face to face meet-ups and “Bootcamps” (intensive language learning weeks) are arranged. The combination of online and offline opportunities offers:

1. A means of socialising into a new community.
2. Communication with a wide range of peers (who may be widely distributed)
3. Speaking practice in authentic real life situations

Eight participants in the study described in section 4 were using SSIW to learn Welsh. Other Welsh digital resources are available for learners, and there are also resources available for and produced by native Welsh speakers.

A number of researchers have investigated the use of Welsh in social media. For example, Cunliffe, Morris and Prys (2013) report on how by young bilinguals use Welsh and English on Facebook, and found that language use online is largely determined by home use: it is an extension of everyday language. They found that for most participants their Facebook community resembled their real life community. In North West Wales, where most participants speak Welsh at home, both languages were used, with Welsh commonly used, whilst it was not as frequently used in the South East. The authors suggest therefore that Facebook could play an important role in maintaining Welsh networks. In another study Johnson (2013) investigated the use of Welsh by bilingual Twitter users and how this varied according to their presumed audience. He found that just under half used Welsh, and where a Welsh audience was in mind, the norm was Welsh. So it seems that Welsh is well represented in the use of Facebook and Twitter.

For many learners, however, Welsh Facebook might be a bit daunting, and too difficult, although Twitter is used for Welsh learning by SSIW who set a word a day game/challenge.

However, resources specifically for learners are freely available including the BBC⁽ⁱ⁾ [‘learnWelsh’ website](#), and programmes for learners from the Welsh television broadcasting company S4C: the current series is called [Dal Ati](#) (Keep At It) which replaces a series aimed at beginners, Hwb, mentioned by several participants. Other freely available resources for learning Welsh can be easily found. A recent simple Google search, using the terms Welsh learning resources returned 1,200,000 hits at the time of writing – although many of these won’t be freely available.

4. A case study on using digital resources for informal Welsh learning

Despite increased interest in the advantages in using digital technologies for informal language learning, there is a paucity of empirical evidence on the extent to which such potential is being realized. This project therefore aimed to research the use of digital technologies for supporting Welsh language learning, with an emphasis on informal learning, through investigating existing practices. The research questions were:

1. What use is made of digital technologies and resources to support informal Welsh language learning?
2. How do learners use such resources to support their learning?

4.1 Methods and participants

The study employed interviews and a small survey to study the practices of learners at all stages of their language learning. Interviews were chosen as the intention was to uncover practices and thus this method was appropriate as it allowed the exploration of such practices, and provided a learners’ perspective. The interview schedules were partly based on the research of Kukulska-Hulme and de los Arcos (2012) on using mobile devices for informal language learning in order to be able to compare data. Participants also completed a small survey to provide information on their background, language learning experience and expertise. Initially, the author asked for volunteer participants at the [Welsh National Eisteddfod](#), a Welsh Arts festival. The Eisteddfod includes a ‘Learners’ Area’ where the author gave a short talk on the role of blogs in learning Welsh. Further potential participants were obtained via contacts who were teaching Welsh and via two Facebook groups on learning Welsh. Thirteen participants took part in

interviews; either face to face, or more frequently by phone, which lasted between 40 and 90 minutes.

4.1.1 Analysis approach

The interviews asked about participants' use of digital technologies, including mobile devices, to support their Welsh learning. Their use of social media has been reported elsewhere (Jones, 2015) and so is not the focus here. A thematic approach was taken to analysing the interview transcripts (Braun and Clarke, 2006) in which the transcripts were scrutinised for emerging categories, producing a long list which were then re-evaluated and reduced to provide a small number of themes. The themes that emerged from the analysis of interviews have been drawn on to address the research questions.

5. Findings

There were thirteen participants: seven women and five men. Three classified themselves as beginners (B); two as beginner/intermediate (B/I), two as intermediate (I) and four as experienced (E). Three of these experienced learners taught others Welsh.

5.1 Learners' practices to support their informal Welsh Learning

Learner	Level	Reading	Speaking	Writing	Listening	SSIW
1 Jane	I		✓	✓	✓	
2 Catrin	I	✓	Limited	✓	✓	
3 Tina	B/I	✓	✓	✓	✓	
4 Paul	E	✓	✓	✓	✓	
5 June	B/I	✓	Limited	✓	✓	✓
6 Sue	B	✓	✓	✓	✓	✓
7 Jan	B	✓	✓	✓	✓	✓
8 Jim	E	✓	✓	✓	✓	✓
9 Mat	B	✓	✓	✓	✓	✓
10 Jon	E	✓	✓	✓	✓	
11 Ann	E	✓	✓	✓	✓	✓
12 Sam	I	✓	Limited	✓	✓	✓
13 Cal	I/E	✓	✓	✓	✓	✓

Table 1: Participants' activities across the four language skills

5.1.1 Speaking

Table 1 shows activities undertaken across the four language skills; the participants' language skill level, as described above,

and who uses SSIW, (see section 3). Six SSIW participants learn with the SSIW course, and Ann uses the materials to support her Welsh teaching. All participants engage in learning and practicing all the skills, but three spend limited time in speaking Welsh. Catrin does not have many opportunities to speak Welsh and does not see technology as helping her with this. June, who lives Switzerland, also comments on the lack of speaking opportunities. All other participants except one have found or created regular opportunities to speak Welsh. The exception, Sam, has access to a conversation group, but has not found much common ground with the group, and so does not attend. Ten participants do speak Welsh regularly: seven of them in face to face situations. Possibly the fact that the three who speak Welsh on Skype are at intermediate or experienced level is noteworthy: Skype may be a more challenging medium for those with less experience, where gestures are not so easily used and interpreted.

5.1.2 Listening: on the move or at home and listening to lessons

Listening to the target language is perhaps the most convenient activity to undertake on the move using mobile devices. However, many participants describe the convenience of moving around the house and learning in different locations at home, rather than out and about, as Sally notes in talking about using her tablet for SSIW lessons:

Well it is portable so whatever I am doing I can listen to the lessons. I can be washing up, ironing, sitting, knitting.... I can be in the kitchen and I don't have to take a big laptop. It .. gives me the ability to learn Welsh wherever I am at home.

The focus of the interviews was on informal Welsh practices: i.e. activities that were not part of formal courses. However, all participants had taken courses at some point and eleven were taking courses at the time of the interviews: six were mainly learning through taking an online course, SSIW (Say Something In Welsh, see section 3) and a seventh was using it to support her teaching. SSIW learners downloaded the course onto their smartphones, iPads or listened to it whilst they were travelling, or at home - often whilst they did household tasks. Three learners also used [Cadw Sŵn](#), described as "a complete Welsh course which uses music and stories to support the learning process"¹. [Memrise](#) was also used.

¹ The website says; Cadw Sŵn is a complete Welsh course which uses music and stories

Not surprisingly, what resources were accessed and how they were used, depended on language level. Nearly all participants listened to Welsh radio, allowing them to access authentic materials and to hear Welsh spoken at normal speed. Although learners at beginner or intermediate level could not always understand much, they saw exposure to the language as helpful. Catrin, who listened to Welsh stories on her MP3 player said:

I will happily sit with earphones in my ears hearing someone reading me a story. Even if I am barely following it, the language is still flowing over me...

Indeed, not understanding the radio meant that some learners were happy to have it on at work, because they would not be distracted:

I listen to Radio Cymru as a background on the laptop too. At the moment I don't understand enough to get distracted by it. (Matt)

Participants also described how different levels of Welsh can serve different purposes. For example, Cal describes how he understands conversation in a lighter chat programme when he listens in the car, using his phone, during his 15 minute commute between home and work:

On my phone I pick up the internet radio I get the news and then a bit of chat, they bring school children on and that is brilliant because I can understand that. They don't speak in whole sentences but use words ... that I know.

However, he listens to the news for a different purpose as he does not understand it:

...the news is technical it is political and I get lost, so I do that simply to train my ear and hear the rhythm.

Another aspect of mobile learning is that it can be timely: learners can start when they are motivated and really want to do it. Matt explained how learning Welsh started for him: *I was in Blaenau Ffestiniog a year ago on my own and I found and downloaded SSIW whilst I was there. Also I found a centre that supported Welsh activities and provided cultural; opportunities and attended a drop-in class*

5.1.3 Reading and writing

Given that many participants focussed on conversational Welsh, it is perhaps surprising to see that reading and writing featured for everyone, including beginners. For many, this consisted of writing and receiving emails, text messages and/or tweets; hence the reading and writing was in quite small chunks. However, more experienced learners reported extensive use of digital resources to support their writing, in particular those participants who were trying to live much of their lives through the medium of Welsh. Paul describes how he uses technology to do this as much as possible and searches for Welsh applications:

... I'm struggling to find welsh applications so largely it's a matter of texting and (Welsh) Facebook. On my desktop I have windows in Welsh, and I have a Mac laptop and a Smartphone. I use Welsh whenever I can: it's a good way of broadening vocabulary. The frustrating thing about using Macs and Apple is it doesn't have as much for the language. I use the Microsoft interface in Welsh and all applications in Welsh (Excel, Outlook). They work exactly like the English – it is a matter of becoming familiar with the Welsh language terminology used

5.1.4 Multi-Tasking, being opportunistic and planning

As reported elsewhere (e.g. Kukulska-Hulme, 2012), participants reported multi-tasking and using unexpected small periods of time to do their Welsh learning. For example Catrin noted *... and if I am waiting outside in a car park to pick [the children] up, I think 'oh, I'll just listen to something now'* This use of spare time that arises is not planned, but as learners had their devices with them they could use them if an opportunity arose. So Catrin listened to Welsh stories in the bath and Sam listened on his phone whilst cooking. In addition to such spontaneous language learning activities, there were also many planned activities. These included activities for travelling time: hence podcasts, stories, lessons and the radio were listened to whilst walking, driving and on the train and bus, or doing activities at home that did not require their full attention. Matt, learning through SSIW, described how his Welsh learning encompassed both a planned schedule and spontaneous activities.

At the moment both. I enjoy it so don't need a regular schedule. Twice a month I go to meetings or clubs to talk W and that prompts me. ...there are various prompts such as needing to drive somewhere, or "by Friday I need to ...". When I run out

of steam I may need to change my approach. My goal is to get through the course. There is a final lesson that tests everything. I want to then do course two and perhaps three.

5.1.5 Helping others and creating resources

As can be seen from table 2, an extensive number of resources was used. Indeed one of the participants, (June) already fluent in three languages, commented:

Welsh is the only language I know that has so much material online.

Whilst beginners often gave examples of using digital technologies to listen to and view Welsh, the more experienced learners, such as Paul above, drew on digital technologies to support more complex tasks or to help them to support other learners: two participants were teaching Welsh and Jonty was supporting Welsh learners in England through a Facebook group, publications and newsletters and running workshops for learners:

I also use Google circles and have gone to the SSIW group meetings – the hangouts which are very interesting. ...Through the publicity and through SSIW, we have attracted learners from Manchester, Sheffield and of course Jed [pseudonym] from Norwich. Now there is also a group in Solihull and Leeds.The Welsh site is really a blog... and there is a real blog as well: Llais y Dderwent. Once a month I update it and use it to put up forms about the workshops.

Ann comments on how she uses digital resources for her teaching:

I plan my lessons on here,[the desktop] and I keep my files. I read the news on the BBC website. I send emails out mainly from the desktop because I have a really nice Welsh spell checker that is built in.

...

I ... downloaded the language lab from Microsoft because that will work on email.... I've put the Facebook page into Welsh so the spell checker works on that. If I used Facebook when I was writing my blog that would pick up the spellchecker on the computer...whereas if I opened the blog up in FireFox it would use the Microsoft spellchecker which is really odd ... The Keyboard is a Welsh one because there are keystrokes for the accents...

Both Ann and Jonty refer to blogs that they write or have written. Ann stopped writing hers once she started spending time teaching and Jonty uses his to support learners and to inform them about activities in the local Welsh learners' group. Paul, another participant who is now teaching, talked about how he collaborated with a friend and colleague to develop digital flashcards for learners.

Table 2 shows the digital resources used by the participants and also indicates the extent to which they make use of mobile devices, and if so what resources they use:

Participant	Mobile	Digital Resources used
1 Jane	Podcasts,Flashcards	Dictionaries, school website, translation app, S4C website ¹
2 Catrin	CDs in the car	Memrise ⁽²⁾ , S4C ⁽³⁾ , Facebook, CadwSŵn
3 Tina	Watching TV on the iPad, welsh music	Cyw, S4C, BBC website resources, BBC Catchphrase resource
4 Paul	Looking for ways to use Smartphone in Welsh, texting	Catchphrase, Big welsh challenge for learners, Welsh blogs (for reading)
5 June	SSIW lessons downloaded onto MP3 player for use on the move	BBC Learn Welsh website, SSIW, Welsh radio, S4C, stories, films.
6 Sue	SSIW lessons downloaded onto tablet for use at home	SSIW, Welsh radio, Welsh TV programmes, particularly Hwb ⁽⁴⁾
7 Jan	SSIW lessons on tablet for use at home, mobile for texting in Welsh	SSIW, S4C, particularly Hwb
8 Jim	Laptop for SSIW lessons and practice	SSIW, Welsh radio, S4C, facebook for Welsh groups, twitter for SSIW daily word, Skype
9 Mat	Mobile for SSIW lessons whilst driving, on train or whilst walking	SSIW, Welsh radio, Google translate, Facebook,S4C, Hwb.
10 Jon	Welsh music on CD player in car and Welsh radio from pub car park	Welsh twitter, Facebook, blogs, BBC Catchphrase ⁽⁵⁾ , Y Bont ⁽⁶⁾ , Skype
11 Ann	Resources for teaching on smartphone and ipad	Golwg360 ⁽⁷⁾ , y Bont, Youtube, SSIWiPlayer, S4C, Clic, SSIW, Facebook

12 Sam	CadwSwm and SSIW on iPad, also S4C on iPad/iPhone	CadwSŵn, S4C, Hwb
13 Cal	Welsh radio in car travelling to work	SSIW, Welsh radio, Google translate, S4C, Hwb, CadwSŵn

Table 2: mobile digital resources used by the participants

5. Discussion and conclusions

The findings from the study have shown that participants use digital technologies, including mobile technologies to support all the different language learning skills and practices. However, the use of digital and mobile technologies does not support all skills equally: some participants, especially beginners, prefer to speak face to face. Listening is a favoured and convenient activity that can be fitted into and around busy everyday schedules and it can be done whilst doing other tasks. What was surprising was that six participants were learning using the conversational Welsh course Say Something In Welsh, although some were also using other courses. Which resources participants used depended on their level. Beginners would choose to listen to the Say Something in Welsh lessons, or to other resources aimed at beginners: however, some would also have the Welsh radio on in the background so that they could become familiar with the rhythm and sound of the language.

Participants really valued their mobile devices which allowed them to learn where and when convenient. For many this was within the house, or in the garden, where they combined their learning with other tasks. Some, however, did use their mobile devices whilst travelling.

The learners varied considerably in how their technology use supported their reading and writing, with experienced learners using sophisticated software to help check and edit their work, sometimes for other learners, and doing some extensive writing (blogs or newsletters) and even creating resources. However,

-
- (2) an online learning tool with courses created by its community for teaching languages
 - (3) S4C is a Welsh-language public-service television channel broadcast throughout Wales.
 - (4) Hwb is a Welsh channel TV programme for learners
 - (5) Catchphrase is part of the BBC LearnWelsh site, offering free downloadable audio and text learning. Archived material available at <http://www.bbc.co.uk/wales/catchphrase/>
 - (6) Y Bont (The Bridge) is an extensive digital collection of courses, exercises, games and other resources, gathered together and produced as part of Wales' adult learning programme.
 - (7) A Welsh digital news and information site

even beginners talked of using emails and twitter – and these seem to provide good practice in reading and writing in short chunks. It seems that the combination of the wide availability of resources (much of it free), and being able to access these anywhere (even if learners don't always choose to do this) makes learning Welsh a realisable activity for those who want to do it. In summary, the study showed that:

- Listening is a key activity
- Reading and writing are also core activities, including at beginner level where learners often used tools such as micro-blogging or texting suggesting that creating and reading short texts can play a useful role in language learning. Experienced learners wrote larger pieces of text such as blogs or newsletters
- Mobile learning allowed the use of spare time and multi-tasking and supported a pattern of learning that was often both spontaneous and planned
- Participants moved between informal and formal learning practices
- Mobile devices were often mainly used at home

What are the implications of this for other minority languages? As one participant noted, Welsh is well resourced. However, other minority and endangered languages have also received considerable interest in recent years, including how they 'fit' into the digital age. Fifteen years ago, Crystal (2000) noted new opportunities emerging for media production and consumption in minority languages: "An endangered language will progress if its speakers can make use of electronic technology" (Crystal, 2000, p141). Since then there have been numerous examples of how minority languages are represented in the digital age. These include community led initiatives such Tura Arutura's use of Irish language raps for teaching Irish (see <https://www.youtube.com/watch?v=n0sCindkvq4>), and corporate initiatives and partnerships. Google's partnership with the Alliance for Linguistic Diversity, (see www.endangeredlanguages.com) and the provision of a version of Windows8 in Cherokee are two such examples. Turin (2012, op. cit.) reports on how projects in the US, UK and the Netherlands include collaborative work with minority language communities.

Language learners are creative and opportunistic in finding and using digital resources for their informal learning (Demouy et. al., op. cit.). It is also clear from the study reported here

that learners do not only engage in informal learning or formal learning. The criteria for participants included being engaged in informal Welsh learning supported by digital technologies. However all the participants had at some point taken formal courses. So learners make use of what they can to support their language acquisition.

Although this sample is small, which is a limitation, the types of practices that learners engaged in, is similar to that reported in other studies, including Demouy et. al's large scale study (Demouy et. al., op. cit.) and Kukulska-Hulme, 2012). Understanding more about learners' mobile pedagogies and their challenges and successes can inform designers of language learning apps for mobiles as well as designers of language learning courses. For example, Kukulska-Hulme, Norris and Donoghue's recent guide to mobile pedagogy for English teachers drew on the experience of both learners and teachers who made use of mobile learning (Kukulska-Hulme, Norris and Donoghue, 2015). By continuing to investigate learners' mobile pedagogical practices, it is hoped that our understanding can contribute to supporting future language learners, whether they are learning minority languages or not.

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