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The Mobile Language Learner – Use of Technology in Language Learning

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Abstract: This research investigates how students in higher education engage with mobile devices when learning languages. The research addresses the following questions: What productive language learning activities evolve on mobile devices and how are they situated in students' learning environments? How do students' learning strategies contribute to mobile language learning? The study is based on questionnaires, interviews and observations with students concerning their mobile usage. The results show that engaging in online communities for learning purposes is increasing and that the participants have a broad view of what can be included in the concept of learning. Being productive with technology is a way forward to develop mobile habits is a constructive way for language learning to take place.

Keywords: Mobile Assisted Language Learning, Higher Education, Ubiquitous Learning, Language Learning, Learner-Driven Pedagogy
Categories: Computer applications (Arts and Humanities).

1 Introduction

The range of areas for mobile activities is increasing as mobile technology is used as an integrated part of everyday learning [Alamri et al., 14] [Park, 11]. As a consequence, there is an evolvement of on-demand technology that adapts to the learner in what is termed "augmented learning" [Sheehy, Ferguson and Clough, 14]. Learning with mobile devices has come to entail fluid transitions between informal and formal contexts [Büscher and Urry, 09] [Motteram and Boy, 13]. Also, for language learning in this respect, mobility means connecting facilities for engagement and collaboration. According to [Kukulska-Hulme 13] the access of mobile technology supports "continuity of learning across diverse contexts and physical settings as well as extending opportunities to learn" (p. 2). This means that the physical and mental boundaries of traditional classrooms are transformed, expanding some of the traditional learning contexts [Dooly, 08].

For students in higher education, use of mobile devices is influencing all aspects of daily life. These students are used to engaging in digital environments as a means to communicate. [White and Le Cornu, 11] challenge [Prensky, 01] metaphors digital native / digital immigrant and instead introduce a more updated distinction, visitor / resident. As suggested by [White and Le Cornu, 11] the variation of how we see our online engagement ranges from that of being a visitor, i.e. using technology temporarily, to being a resident, i.e. a member of the web. Being a resident implies living a great deal of life online, part of various online communities, staying constantly connected.

The use of mobile technology is increasing exponentially, particularly with smartphones where 8 out of 10 users of smartphones surf the Internet on their phone every day [Findahl, 14]. Together with the increased access of Wi-Fi, this also implies development of facilities for users to engage in net-based activities. This is in line with ideas that users are closely connected to development of learning activities since being productive online, they are part of both the design process as well as the refinement progression of existing technology by merely using it [Castells, 96].

The purpose of this research is investigating how engagement with mobile technology facilitates learning languages among students in higher education. This is based on the premise that when learners are engaged in productive activities, learning is promoted [Liu and Chen, 14]. In this study, when students are speakers of less used global languages, such as Swedish, learning to communicate in English and other foreign languages is something that has high importance. The overall aim of this research is thus to contribute to the understanding of how uses of mobile technologies are changing conditions for language learning from a learner-driven pedagogical perspective [Kukulska-Hulme, 13].

This research addresses the following questions:

- What productive language learning activities evolve on mobile devices and how are they situated in students' learning environments?
- How do students' learning strategies contribute to mobile language learning?

2 Collaborative Mobile Language Learning

From a sociocultural perspective, learning is a reciprocal process, situated in a social and cultural context (see [Warschauer, 05]; [Wells, 00]). Learners interact in a social and material environment where relationships and culturally constituted artifacts play important roles for thinking and learning [Vygotsky, 78]. Connecting this to practices within mobile devices, this is related to social aspects of language and contextualization of the language learning process. From this point of view, learning is a dialogic process between learners as well as with the mobile device.

Developing digital literacy will make students independent learners with mobile devices [Ng, 13]. The concept of new literacies points out the multifaceted nature of literacy in modern society founded in the development of participatory cultures [Lankshear and Knobel, 11]. It is suggested by [Ng, 13] that literacy associated with learning with mobile devices is an area in need of more research.

Although recent mobile technologies are increasingly built on net-based applications allowing for formation of social interaction and collaboration through wireless Internet, mobile technology has traditionally been more individualized and considered an instrument for autonomous language learning [Stockwell, 08]. A mobile device is for instance suited to play the role of a personal mentor. Learning content can be personalized and adapted to the learning context of each participant as displayed in a study by [Cabot et al., 14]. Research on language training with mobile technology has focused on affordances inherent in mobile applications for training, such as vocabulary (see [Song and Fox, 08; Stockwell, 08]) or pronunciation [Fouz González, 12].

However, mobile devices have capacity to support ubiquitous cooperative interaction and sharing, which has opened up ways of learning together with others. There are studies focusing on social interaction and collaborative mobile language learning [Lan, Sung and Chang, 07] [Rosell-Aguilar, 08]. In an investigation of the application of mobile blogging, Chinese students in the UK enhanced their understanding of British culture by a context of socialising and exchanging information with students in China [Shao, 11]. Another example is a design-based study seeking to enhance English as second language students' aural skills by means of mobile practices evolving from a set of podcasts [Palalas, 11]. These two latter examples, display the power of collaboration to motivate language learning.

Exploring ways that learners are engaged in language learning activities means taking a bottom-up perspective on the learning as being part of the development phase [Ros i Solé, et al., 10]. The focus on what learners do when co-constructing knowledge to solve problems [Kukulska-Hulme and Shield, 08] still needs to be explored further.

3 Methodology

This section first presents the participants engaged in the study and the design premises. Then, the data and analytic process will be described leading to the results.

3.1 Participants and Design

This research scrutinizes instances where students are initiators of technology. As stated by Sharples [Sharples,10] it is useful to first establish who is initiating and managing the mobile learning situation. The study is situated within research based on ideas of having a focus on the learner, i.e. "the 'learner's perspective' on e-learning and mobile learning, in the context of increasing learner autonomy, personal choice of tools and learning spaces" [Kukulska-Hulme et al., 11, p. 19].

The participants comprised 58 third-year computer engineering undergraduate students in Sweden aiming at an international career as engineers. The students were quite homogenous in academic background, gender and age. The majority of the students were in their final undergraduate year before entering either a Master's program in Computer Science and Engineering or working life. At the time of the study, the students were taking a course in English for Specific Purposes for Computer Science and Engineering. The aim of the course was to enhance the students' ability to be effective communicators in English, with a focus on academic writing and presentations, preparing the students for their professional career.

The sample consisted of 55 males and 3 females, which was representative of the gender distribution in this study program. The age range was from 20 – 28 years, the average being 21 years old. Concerning the students' language background, the distribution of their mother tongue was Swedish (n = 55), Arabic (n = 1), Finnish (n = 1), and Hungarian (n = 1). Also, the students had taken at least seven years of English at school, so the level of English was advanced with a level of B2 or C1 according to *The Common European Framework of Reference for Languages: Learning, Teaching, Assessment* [Council of Europe, 01]. The students in question were generally very active online, using English as their primary online language. Apart from being

competent in at least the two languages Swedish and English, the majority of students also knew one or more languages.

Focusing on a targeted group of computer science students in higher education means a group who is in the forefront of using technology. They are early adapters and keen to explore as well as make use of affordances in technology, in other words, what [White and Le Cornu, 11] term residents. They can likely be seen as indicators of trends in mobile development for learning. Investigating such a homogenous group also caters for a possibility to compare usage across contexts within this group. In addition, scrutinizing this type of student in higher education implies targeting students with expectations of being competent members of a specific language environment with demands of foreign language learning skills for their careers.

With growing globalization and an increased number of mobile devices hosting advanced technology, trends have subsequently moved the computer into the hands of all users of small devices, such as smartphones and tablets. There are initiatives in education looking for ways of reaching out to learners even if development incentives are lagging behind existing technological practices [Dyson and Litchfield, 11]. From the different pedagogical models identified for mobile assisted language learning (MALL), ranging from packaged material to more flexible models [Kukulska-Hulme, 13], this research focuses on the latter, self-initiated models.

3.2 Data and Analytic Process

In order to investigate how students engage in mobile learning, the study is based on qualitative methods. As suggested by [Büscher and Urry, 09] investigating learning on the move with intermittent usage through multiple technologies, a combination of methods will catch emergent mobile activities.

The study is based on questionnaires, interviews, and observations with students in order to follow mobile usage from a bottom-up perspective. The procedure started by introducing the objective of the study to the students during a lecture in the beginning of 2014. During this occasion, a consent form was also handed out to the students, informing about project goals and explaining the purpose of their answers. The names of the participants were protected at all times and they could also withdraw their participation at any point. There were a high number of respondents, 58 students out of the 60 students in total enrolled in the class.

The questionnaire allowed for quantitative evidence and qualitative trends in usage. The questionnaire was designed with text fields, multiple choice statements, polar questions with subsequent text fields, inviting the participants to contribute with additional comments after each question. The questions were organized into three blocks; 1) technology and online communities used for learning, 2) production and sharing of content for learning and, 3) language learning strategies applied (see Appendix A) The introduction of the questionnaire expressed the objective of the study, i.e. investigating uses of mobile devices for learning, specifically geared at language learning. The nature of the questionnaire, designed with text fields accompanying each question, was designed to cater for reflexivity, promoting the participants to consider how technology is used. In this way, the reflections would trigger a process of further sharing procedures for learning. Since the questionnaire was anonymous, those who volunteered to be interviewed were asked to contact the researcher to appoint a time.

Eight students contacted the researcher for individual interviews. The interviews were carried out two months after the questionnaire, allowing time for the students to reflect on the questions before being interviewed. Each interview, which lasted for 30-40 minutes, was conducted with the screen capturing program Camtasia, catering for online observations. Recording the interviews enabled transcription as well as providing the possibility for the students to display the application of software and websites since their screen movements were also recorded at the same time. Catching the process of interaction is suggested as one of the mobile methods for empirical research by [Büscher and Urry, 09].

The interviews were semi-structured, taking a starting point in the same questions as in the questionnaire. To capture the respondents' reflections, they were encouraged to expand on the questions, allowing for a more in-depth understanding of mobile usage areas. The researcher handling the data and analysis was not involved in teaching the students.

The students could choose whether to be interviewed in Swedish or English. Only two students chose Swedish, claiming they were more comfortable speaking Swedish in an interview situation. Thus six chose English, with the motivation that carrying through an interview in English was not an issue and since they were currently taking an English course, they took the opportunity of speaking English.

4 Results

The results are based on the outcomes of the gathered data and analysis. In this section, first the implications of the mobile technology that students use are accounted for. Then, the notion of activities related to production and sharing of content is mapped out in order to shed light on how collaborative online activities are perceived. Finally, the learning strategies that are used for language learning with mobile devices that the students were engaged in will be discussed.

4.1 Implications of Technology

First, a baseline of usage was established, verifying that the trend is going towards increasing mobility with digital devices, particularly the use of smartphones among young adults [Findahl, 14]. All respondents in this study have a smartphone or access to a handheld mobile device. Concerning the question of technology primarily used on a daily basis, there is a combination of devices. The majority claims that they own at least two mobile devices, such as tablet and smartphone, apart from a laptop or stationary computer. The devices are used interchangeably, due to their network affordances. As many as 46 out of 58 use more than one mobile device every day for surfing the Internet.

There is a distinction in mindset using a stationary mode from using a mobile mode. In the students' everyday working situation, for instance engaging in programming assignments, there are practical reasons for using a laptop or stationary computer, such as accessing installed software, or the need of a certain screen size for assignments. However, when online activities take place on the go or when no specific restraints exist, a mobile device is used. The small size of the screen is not considered an issue even though several tasks entail multiple screen movements,

shifting between web-pages, zooming, filling in text fields, clicking and reloading pages on the mobiles. The following excerpt is an example displaying this diversity in engagement:

> On the bus when going between home and school, I mainly watch YouTube clips, surf and read web pages, but also write in a collaborative text through Google Drive or do some Facebooking. (Interview 3)

Even though some online activities are preferably done on a larger screen, such as programming and networked gaming, there is generally transferability between what is done on a mobile device and on a stationary computer or laptop.

Participating in university education, it is common that students find material online complementary to what is offered in courses taught in modules. There is significant activity going on which is not recognized by the formal institution. For the students, this is a common way to fill the gap between taught lectures and classes and what is offered in the course book. The next excerpt recognizes the impact of online sources for learning, which should not be under-estimated:

> Teachers don't generally introduce or encourage external, online material. This is something we have to find out ourselves. For instance, I managed one of my math's courses since I was using Khan Academy and other online resources. I'd say that 30-40% of a course was dependent on online material for complementary information together with asking classmates. (Interview 5)

Suggested online resources are propagated by other fellow students. This can take place in joint online social networking groups where they are engaged in sharing information.

4.2 Social Network Groups and Communities for Learning

From the vast number of activities performed online, engaging in communities for sharing of content for learning purposes is something that is increasing [Park, 11]. A majority of the respondents, 37 out of 58 (sett Table 1) claim they are active in social networking groups for learning such as Facebook (21) and Twitter (12) or communities specifically related to learning, such as Ted Talks (19) and Khan Academy (14). From those who stated not to be engaged in learning groups on a regular basis, they are still frequently visiting such groups to participate in ongoing discussions.

Students' use of mobile devices for learning (n=58)	**Yes**	**No**
Active in social networking groups or communities	37	21
Learning through interaction	45	13
Have used or using language learning apps	36	22

Table 1: This table highlights some of the main usage traits from the questionnaire; students' use of mobile devices in groups or learning communities, for interaction, and by means of language learning apps.

Further, it is interesting to note that the students labelled pastimes not traditionally associated with education as learning activities, such as reading newsletters and engaging in forums for special interest groups. For example, one activity that is claimed to take much time is reading informative websites. This broadened concept of learning emerges through ubiquitous use of technology creating a convergence between the virtual and physical world [Sheehy, Ferguson and Clough, 14].

Another common activity labelled as a learning activity by the students is watching multiple modes of interaction in film clips with instructions or tutorials. Concerning the question if online learning channels are used for learning, YouTube channels such as Vsauce and minutephysics are mentioned as major sources for learning. Most of the respondents claim that learning activities imply watching videos with instructions and tutorials. As many as 29 actively subscribe to at least one online facility for learning which offers a wide variety of topics. Usually, the respondents subscribe to several online resources. As many as 45 of the respondents claim that they use online modes of learning which entail interaction with the application, where engagement implies learner input (see Table 1). However, interaction is considered to be a broad concept, since also YouTube channels offer certain interaction through commenting functions. This is in line with what [Liu and Chen, 14] suggest that productive modes of interaction encourage learning.

4.3 Production and Sharing of Content for Learning

As part of the evolvement of the network society [Castells, 96], users are part of the design and production of content. However, this is still an area that is slowly developing (see Table 2). Since a great deal of the learning material online consists of instructive videos, the students were specifically asked if they have produced and shared their own video for learning purposes. Although 13 answered that they had done so, this is still a quite uncommon activity. Hosting a website with shared content was a bit more common with 24 responses. To the question if ever having developed a mobile app, there are a great number of responses (46). The explanation is that this is part of one of the software engineering courses that the students participate in, thus the high number.

Students' productive online learning contribution (n=58)	**Yes**	**No**
Produced and shared video for learning purposes	13	34
Shared content on your own website	24	34
Developed mobile app	46	12

Table 2: This table shows online learning contributions in student production and sharing of online content.

It is interesting to note that as many as 36 students are using or have used a mobile app such as Duolingo or AnkiDroid flashcards for language learning purposes in their spare time (see Table 1). These apps are used for different reasons; brushing up some previously learned German, French or Spanish but also for beginner Mandarin or Japanese. There is usually a combination of other means than only general language learning apps, for instance learning apps dedicated specifically to Chinese. Being

computer science students, some have also engaged in development of online courses. Three students are appointed as e-learning developers for a university program engaged in development of distance courses for engineering students at an upper secondary school. In addition, one student is an active participant in creating flashcards for AnkiDroid in Swedish sign language.

In some cases, the download of a language learning app did not lead to any further usage. According to the students, since they had not made a routine for using it, they discarded the idea of proceeding with it.

4.3 Learning Strategies Applied in Mobile Language Learning

The fact that the investigated engineering students are engaged in an English for Specific Purposes course forms a backdrop to this study. In addition, the interviews verified that the content of the questionnaire triggered the students' mindset around questions of learning, and language learning with mobile devices. In their English course, there are no specific language learning activities promoted on mobile devices, though there are a few online collaborative assignments for the students. These take place over the university learning management system where teachers communicate with the students, but also on student driven spaces such as Google Drive and Facebook.

Concerning the question of strategies used when learning a language, although visiting the target country, being immersed in the language, is the most preferred approach, online learning programs are ranked higher than attending a traditional course (See Appendix A). Engaging in self-studies online by using a combination of text, audio and video files, movies as well as short film clips is something that is mentioned in the interviews. The respondents did not consider use of social networking as a primary means of learning a language, although this is a means commonly used for sharing information and sharing ideas. However, if social networking would entail staying connected with someone in the target language, this would be a more interesting option. Mobile technologies cater for flexibility and a way to stay in touch anytime anywhere [Pareja-Lora et al., 13].

In answer to the question of what the students would do on mobile devices when it comes to language learning activities, there is a distinction between randomized and more organized learning. Apart from the time spent on specific classroom activities, the majority of time spent on mobile devices involves quite diverse activities.

One of the crucial matters brought up in the interviews concerned how people can create a routine around mobile language learning with mobile apps. It is stated that the freedom of usage in time and place with mobiles, requires the learner to be disciplined. One student solved this by always engaging in language learning when going home on the bus. In [White and Le Cornu, 11], place and space are suggested to have a social dimension of importance. A sense of social presence "is something those who spend time on social media platforms experience to a high level" [White and Le Cornu, 11]. However, making a routine can be challenging as stated in the following excerpt:

> I repeat my old languages online, Italian, French and German but not on a regular basis, which would have been better. Now it's more killing time once in a while waiting for something, for a meeting to start for instance. (Interview 3)

If advancement is embedded as a component in the system, regularly stating a progression for the learner, this is considered even more helpful. Another, quite contrary way of learning online is raised by those who interact with others in social networks. This is also mentioned having an impact on learning. In the following excerpt a student explained:

> I speak with Spanish speaking people via the Internet that I met when I was living in Ecuador for a year. Sometimes I read a text in Spanish too and then I use Google Translate directly when reading it. (Interview 2)

Apart from using online translation services for language comprehension, dictionaries are also mentioned as a learning application for language training. Online specialized dictionaries and encyclopedia are used as resources for learning. A great number claim that they look up expressions that are unknown right away, toggling between text and dictionary, when deep-reading a text for the English module for instance.

5 Conclusions

This research set out to investigate the question of what productive language learning skills students who are residents [White and Le Cornu, 11] engage in on their mobiles. This research displays a diversified picture of mobile language learning and that the participants have a broad view of what is included in the concept of learning. Even though social networking is increasing, a primary part of mobile language learning activities are still individual activities. The learning strategies applied is a mix of what is learned from school and what persons do in social networking. However, networking by collaboratively engaging in learning communities will likely increase as time goes by.

Concerning the question of how students' learning strategies contribute to the development of mobile language learning, the results suggest richness in activity for learning purposes. The students are engaged in activities that are found both in traditional courses and in their online engagement in social networking. The fact that the students were participating in an English for Specific Purposes course when the research was done has bearing on the students' reflections. Also, the method of investigation, giving ample room for reflection between the questionnaire and interview informs the outcome of the analysis.

The findings from this research contribute to the understanding of how mobile environments are used for learning languages in students' everyday lives. The activities evolving on mobile devices will have bearing on the pedagogical uses of such environments. This research informs pedagogical aspects of language teaching and learning. From a literacies perspective, this project is part of exploring the area of participatory culture, and the social connection that mobile devices call for. The use of mobile technologies is a means of accessing, sharing and producing meaningful content.

Investigating learning engagement and activities with a group who is in the forefront of technological use, gives us a glance at the future of other learners. Those mobile activities that are connected to social networking and online communities are likely to increase in impact. Even those activities that are performed individually on a

mobile application for instance, will likely still be some kind of networking, i.e. connected to what others do on their mobiles.

6 Future Work

In having a mobile device, people tend to customize the usage for ways that suit them. More evidence is needed before the transformational power of mobile technology is fully acknowledged in education. In fact, it has been suggested that learning with mobile technologies is a very essential advance in education [Dyson and Litchfield, 11]; [Guy, 09].

Although evolvement in digital devices is moving fast, trends in usage remain longer and are worth looking into. Taking the opportunity to engage with online learning activities when there is time and space is something that mobile technology offers. Still, what is largely chosen by learners is more haphazard than determined by affordances in mobile technology [Kukulska-Hulme, 13]. There is yet discrepancy in what is most suitable for language learning.

Future development of functional mobile language learning would involve a variation of interactive elements such as possibility to discuss topics, listen to sound and/ or video, as well as writing down reflections.

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Appendix A

Questionnaire

Introduction
This study concerns uses of digital media and mobile devices for learning. The questionnaire distinguishes between stationary computers/laptops and mobile devices. Here, mobile devices are mobile phones, smartphones as well as any tablets; phablets, mini-tablets, tablets etc. Your answers are most welcome.

Block 1 Technology and online communities used for learning

1. Concerning technology: what technology do you primarily use on a daily basis?
   - Stationary computers/laptops
   - Stationary computers/laptops & mobile devices

Mobile devices
Additional comment: (State type of technology/ device)

2. Are you part of any social network groups or communities for learning purposes? (These can be formal or informal groups or communities):

Yes
No
Additional comment: (State groups/ communities)

3. Do you regularly use web sites or subscribe to any online learning channels on e.g. YouTube?

Yes
No
Additional comment:

Block 2: Production and sharing of content for learning

4. Have you produced your own video clips for learning purposes that you have shared online?

Yes
No
Additional comment:

5. Do you have your own website where you share content that you have created?

Yes
No
Additional comment:

6. Have you developed your own mobile app?

Yes
No
Additional comment:

Block 3) Language learning strategies applied

7. Have you used online language learning resources or mobile apps for language learning purposes?

Yes
No
Additional comment:

8. If you were to learn a language, what strategy would you use?
(number 1-5 in order of relevance 1= less likely, 5= most likely):

an online language learning programme:
social media:
attending a traditional course in a classroom:

visiting the target country:
other strategy (describe it, please):

9. When deep reading a text (i.e. you really need to understand it thoroughly) in another language on a mobile device and you don't understand a specific word, what is your strategy? (number 1-5 in order of relevance 1= less likely, 5= most likely):

I don't bother doing anything about it:
I'd look it up while reading (via a translation tool):
I'd look it up after reading:
I'd ask somebody in person:
I'd ask somebody online:
Other strategy (describe it, please):

10. What did we forget to ask you about?