Integrating a LSP Dictionary via Mobile Assisted Language Learning in a Multilingual University Setting

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Abstract

Mobile technologies have become worldwide phenomena, opening up new opportunities for language teaching and learning. A literature study on Mobile Assisted Language Learning as well as user research on digital dictionaries is presented. A LSP dictionary on a mobile phone is described, with reference to the aims, structure and functions, as well as the target group of the dictionary. The integration of the LSP dictionary in a multilingual lecture hall is explored, with regard to the structure and functions of the dictionary. A LSP dictionary, called MobiLex was compiled by academic specialists in the faculty of Education for pedagogical purposes at the University of Stellenbosch. The aim of the article is to demonstrate how the dictionary could be introduced into lecture halls at university. MobiLex is trilingual and fits within the university's framework of multilingualism. Afrikaans and English are used as languages of teaching and learning (LOTL) within the university, with the focus on the development of isiXhosa as academic language. A task-based activity for Social Sciences was designed with regard to the dictionary functions of MobiLex.

Keywords: user research; mobile dictionaries; LSP dictionary; multilingualism

1. Introduction

Mobile technologies have become an ever-increasing presence on university campuses. Students with their heads buried in smartphone screens are an everyday sight. Walking down the street, in university buildings and libraries, even in lecture halls, smartphones are their constant companions. Having grown up with the internet, computers, instant messaging, video games and mobile phones, the "millenial generation", has a very different view of information access than their parents and grandparents (Prensky, 2001). Rather than "going to get" needed information, the 18-25 year olds are accustomed to instant information access. Their expectation is to have their information needs and wants answered immediately (Oblinger and Oblinger, 2005).

As opposed to other types of computers, smartphones only require one hand to operate and therefore have an immediacy of use that other minicomputers, such as tablets yet have to attain. The possibilities of using mobile devices for learning are endless. Mobile learning or learning with mobile devices (Kukulska-Hulme and Traxler, 2005), is an expanding field of research and practice, increasingly shaped by rapid technological and socio-cultural change that is at odds with the more leisurely pace of evolving pedagogy, especially the formal pedagogy within higher education. Lecturers and lexicographers have to take cognizance of technological developments, with regard to mobile dictionaries as well as new possibilities of language teaching and learning opening up. Studies on dictionary use have been gaining ground over the last three decades, but while dictionary use has moved dynamically into the digital medium, user research on digital dictionaries has been somewhat slow (Lew, 2015: 1).

Universities all over the world are changing from monolingual to bilingual or multilingual education and it could be worthwhile to research the role of mobile dictionaries in a multilingual environment. The integration of a LSP dictionary on a mobile phone in teaching and learning is

described. The paper is structured as follows: in Section 2 a literature review on Mobile Assisted Language Learning as well as user research on digital dictionaries within the framework of Multilingualism is presented, in Section 3 the research question is introduced, in Section 4 a LSP dictionary on a mobile phone is described, with reference to the structure and functions of the dictionary and in Section 5 the integration of the LSP dictionary in a multilingual lecture hall is explored. The aim of this paper is to design a task where a dictionary on a smartphone could be integrated in teaching a multilingual class to ensure that a dictionary designed for a specific target user is used in an integrated way.

This paper draws insights from well-known lexicographical theories such as Wiegand's General Theory of Lexicography (1984), as well as the Theory of Lexicographical functions (Tarp: 2007,2008.). It refers to established lexicographical terms such as user perspective, user situations, user needs, as well as dictionary functions. Theories of language learning are also involved, such as behaviourist and constructivist learning, as well as the notion of multilingualism.

2. Mobile Assisted Language Learning

Mobile Assisted Language Learning (MALL) is increasing rapidly and is employed all over the world as technology is advancing. In one sense, mobility has been long part of learning, in that learning usually takes part in more than one location. However, mobile learning had gradually become imbued with multiple meanings, some emphasizing the physical mobility of learners; some focusing on the affordances of mobile technology; some emphasizing connections between contexts and settings; and some noting the primacy of access to digital resources. The use of mobile phones has increased dramatically and nowadays most university students are equipped with a mobile phone. The number of smartphones has increased since the mass introduction of smartphones in 2007 by Apple Inc. In 2013 the number of smartphone users all over the world was 1,31 billion, in 2014 it was 1,64 billion and it is predicted to exceed 2 billion by 2016 (www.emarketer.com). Teenager-adults, aged between 16 and 24 are the group with the highest rate of using smartphones, namely 88% (www.zeendo.com). In South Africa most university students are equipped with mobile phones and it is estimated that smartphones would make out 30% of all connected devices in South Africa in 2019 (Fin24).

As the number of smartphone and tablet users increases worldwide, mobile technologies have the potential to be used in a multitude of pedagogical and other contexts in higher education. The use of portable technologies makes it easier for students to study whenever and wherever they want. One category of technology to be used (Patten, Sanchez and Tagney, 2006) is that of referential works such as dictionaries, e-books and office applications.

According to Kukulska-Hulme and Traxler (2005) when designing content for MALL, it could include a variety of different contents. The interactivity afforded by mobile technologies creates a teaching and learning environment more suited for a constructivist approach where the device is a tool for information and direction. Contents are specified with the author's reference to an online LSP dictionary application of the Faculty of Education at the University of Stellenbosch, called MobiLex. MobiLex is a trilingual dictionary, featuring the languages Afrikaans, isiXhosa and English. The following aspects are important to consider:

- Learner-centred content: if students are expected to construct some of the content as part of their learning, this can be done in various locations and mobile devices can facilitate it. It is personal and specific to context, and usually to time and place. For example, when a lecturer mentions a term in class in the language of teaching and learning (Afrikaans or English) which a student does not understand, the student could make use of the MobiLex dictionary to translate the term. In such a case an isiXhosa student could look up the isiXhosa

translation of an English or Afrikaans term used in class. The definition of the term in isiXhosa could elucidate the concept to the student.

- Personalized content: students can receive, assemble, share and carry around personally useful and appropriate resources. For example, when the Curriculum Studies lecturer instructs the class to draw up a lesson plan and a student is unsure of the content of such a plan, a description of the lesson plan could be found in MobiLex.

- Updated content: updates may be more easily delivered to mobile devices when students are highly mobile and would not regularly access a desktop computer. MobiLex is a web-based application and could be updated frequently as new terms are added to the dictionary.

- Timed or scheduled content: students can engage with content frequently, repetitively or periodically using a mobile device without overhead or inconvenience, for example looking up a difficult term during studying for a test or working on an assignment.

- Prioritized content: some content can be made available on mobile devices in such a way as to prioritize it over other content; this may be a useful deliberate teaching strategy. If a student for example is a frequent user of MobiLex, it would appear in search history of the smartphone and it would be easy to access it whenever needed.

- Flexible content: students may appreciate having the option of mobile access to learning material and resources, as an alternative to desktop content. MobiLex is always available, during class, for group discussions or when otherwise needed.

According to Naismith, Lonsdale, Vavoula and Sharples (2004) mobile technologies can be used in the design of six different types of learning, or categories of activity:

- Behaviourist learning — where quick feedback or reinforcement can be facilitated by mobile devices because they are at hand. For example look up the meaning of a term in class when lecturer refers to a term.
- Constructivist learning — where students build up new concepts, perhaps engaging with their physical and social environments. Students are responsible for their own learning. Example of independent learning is when a student studies and cannot remember the meaning of a concept and he/she could refer to MobiLex.
- Situated learning — where students take a mobile device into an educational relevant real-world location and learn from that setting.
- Collaborative learning — where mobile devices are an essential means of communication and electronic information sharing for students in groups outside their educational institutions.
- Informal and lifelong learning — possibly unconstructed or opportunistic, driven by personal curiosity, chance encounters and the stimulus of the environment. Mobile devices accompany users and become a convenient source of information that assists with learning, or records learning experiences for future consultation and reviews.
- Supported learning — where mobile devices monitor progress, check schedules and dates, review and manage progress.

According to Traxler (2009) mobile devices are involved in the wider, social transformation of how people, not just students, acquire and distribute information, images, ideas and opinions, and of how learning is redefined.

Hill and Laufer's (2003) study showed that the use of computer-based dictionaries could lead to more incidental vocabulary learning for Chinese EFL university students. Participants had to read a passage on a computer screen containing twelve words that were unfamiliar to them and then complete tasks regarding these unfamiliar words (Hill & Laufer, 2003: 93). The participants had an electronic dictionary at their disposal (Hill & Laufer, 2003: 101). The results showed that

participants who engaged in more dictionary activity did better and that increased dictionary activity included more use of the *Hear* button, which provided successful auditory reinforcement (Hill & Laufer, 2003: 103).

Fox and Song (2008) investigated students' free use of mobile devices to foster their incidental vocabulary learning in pursuit of their undergraduate studies and in terms of downloaded electronic dictionary use and other uses. The focus of this study was on the perspective of the students at an EMI university in Hong Kong. Qualitative research in the form of case studies was used over a period of one year to determine the outcomes of the Personal Digital Assistance (PDAs) use in incidental vocabulary learning (Fox & Song, 2008: 293). The results not only indicated a positive attitude among students towards PDAs, but students also optimized their vocabulary learning by not restricting themselves and employing various tools such as online dictionaries, e-mail, MSN and so forth (Fox and Song, 2008: 311). The research showed that the PDA can be used in flexible and extended ways for EFL vocabulary teaching and learning (Fox & Song, 2008: 311).

A further study was done involving multiple universities in Hong Kong and Taiwan to evaluate the role of the electronic pocket dictionary as a language learning tool among Chinese students (Jian et al., 2009: 503). For this study a total of 195 questionnaires were collected, of which 193 were used (Jian et al., 2009: 506). Almost 80% of these participants owned a pocket e-dictionary and the results indicated that dictionary ownership was consistent with the expressed dictionary preferences, being electronic or paper-back (Jian et al., 2009: 507). Results showed that the main reason pocket e-dictionaries were preferred were due to speed of access (Jian et al., 2009: 511). Implications of these results are that developers should focus more on the speed of access, because current pocket e-dictionaries are only fast to use when learners know how to spell the query (Jian et al., 2009: 511).

Gromann and Schnitzer's (2015: 1) empirical study on dictionary use in foreign-language teaching suggests that few studies address the use of specialized resources by semi-specialized users (university students in this case). They found that a low awareness and use of specialized dictionaries exist in general among L2 learners. Experts seem to need specialized lexicographical resources and this raises didactic implications, in the sense that students should be familiarized with specialized lexicographical resources before they become experts.

The importance of academic vocabulary to comprehension is well documented (Antoinacci & O'Callaghan, 2011:10). In the use of multilingual glossaries in an Economics course, Paxton (2007; 2009) and Madiba (2014:78) revealed that the effective use of students' primary languages deepens the students' understanding of economic concepts. In Madiba's study, students were asked to define and distinguish between concepts, for example to define the words *deficit* and *loss* and then to distinguish between them. In this instance, findings show that students not only understood the respective terms, but their ability to distinguish between the words also "shows" development or progression in their conceptualization of the concepts (Madiba, 2014:84). Concept literacy enables students to develop their own voice and critically engage with academic concepts, rather than learn definitions by rote.

There is a growing body of literature on the difficulties experienced by students studying their second language at higher education institutions (Mashiyi, 2014: 145). According to Hibbert and Van der Walt (2014: 4) higher education is becoming increasingly multilingual as a result of internationalization drives, the expectations of transnational students and the effects of colonialism. Students have to cope with the demands of multilingualism and one such way could be with the support of multilingual mobile dictionary.

3. Research Questions

Cubillo (2002: 206) remarks on the relationship between dictionary use and language learning as a constant in lexicography. This relationship directs the research questions posed in the article and how to approach it in a learning context. How can a LSP dictionary (MobiLex) be integrated via mobile assisted language learning in a multilingual university setting?

Who are the users of MobiLex?

What is the dictionary structure of MobiLex?

What are the aims of MobiLex?

How can task-based activities be integrating MobiLex in a multilingual class with regard to its structures and functions?

The research methodology employed was to describe the users of the dictionary as they were envisaged at the compilation of the project, to describe the aims, as well as the structure of the dictionary and assign dictionary functions to the dictionary. The described dictionary structures and functions of MobiLex were used to design task-based activities to be used in a multilingual lecture hall.

4. MobiLex as Mobile Lexicon

MobiLex has been designed with a pedagogical purpose in mind, namely with that of providing support to first-year university students on LSP terms in a multilingual environment. The LSP dictionary was thus compiled to meet content-specific needs, as well as linguistic (translation) needs of first-year students in the Faculty of Education. With the target user known to the lexicographer, it is of utmost importance that the structure of the dictionary, the relevant data distribution and the envisioned lexicographical functions should be in perfect harmony with one another. The access structure of MobiLex has been designed to ensure fast, efficient access to subject terms on a first-year level. Students could find subject-specific terms on a web-mobile application. The MobiLex dictionary offers students the opportunity to look up words on their smartphones in Afrikaans, English or isiXhosa.

This LSP dictionary currently provides translations for terms in mathematics (foundation phase), social sciences, natural sciences, educational psychology and curriculum studies. Please refer to the screenshot below in figure 1.

Figure 1: Homepage of MobiLex.

The access structure provides the user with a choice of the source language, namely Afrikaans, isiXhosa or English. In the example below English has been chosen as the source language.
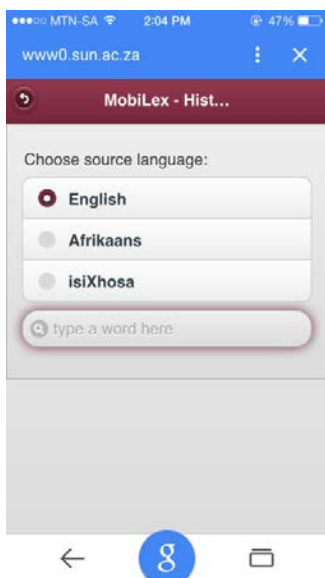

Figure 2: Access structure of MobiLex.

The dictionary is mono accessible and the macrostructure is accessed by typing in the desired term. During the search process, the application also extrapolates with each letter that is being typed in. If the student is not completely sure of the spelling of the term in question, assistance is provided with the supply of a possible term starting with the specific letters that were searched.

Figure 3: Access structure of MobiLex, showing the process of extrapolation.

Two translation equivalents are provided per lemma. Depending on the language selected, the English, Afrikaans and isiXhosa translation equivalents are provided during the search. A short, subject-specific definition on the first-year level is also provided in the preferred language (the source language). Short definitions ensure that the user would not find it necessary to scroll down, because the whole article could fit into the screen of a smart phone. The microstructure of MobiLex is very simple, thus keeping users' needs in mind to find a concise, meaningful definition in a short time. Peters, Jones, Smith, Winchester-Seeto, Middledorp and Petocz, (2008:234) refer to them as "need it now" definitions, that is definitions which allow students to understand their course material and wider reading. One datatype is supplied in the microstructure, namely semantic information.

Figure 4: Microstructure of MobiLex.

Tarp (2008) distinguishes between cognitive and communicative functions of a dictionary. Cognitive functions assist users with general, cultural and encyclopedic data, specific data on the subject field and data on language. Communicative functions of a dictionary assist users on problems regarding text production in the mother tongue or additional language, text reception in the mother tongue or additional language as well as the translation of texts from the mother tongue

to the additional language or vice versa. Müller-Spitzer (2014) found the most common activities supported by dictionary use to be text production, text reception and translation. MobiLex is a multifunctional dictionary with communicative as well as cognitive functions, as it provides data on the subject field (of education, as well as subfields) and it provides translation equivalents for subject terms.

5.   Integration of MobiLex in a Multilingual Lecture Hall

The integration of MobiLex in a multilingual lecture hall is explored, with reference to dictionary look-up tasks and a translation task for students. Research was conducted in the Social Sciences 1 class where lecturers wanted to do an introduction to History terms. Students in the class are from various backgrounds, linguistically, as well as academically. Some of the students had history as matric subject, where others dropped the subject in grade 9 in high school. For that reason lecturers start the course with an explanation of various terms and concepts before further work is done in the course. It seemed like a good idea to introduce students to MobiLex and to combine that with an introduction to concepts.

There are 280 students in the class and they form a truly multilingual class, with Afrikaans, English and isiXhosa speakers. Afrikaans and English are used as LOTL in class. Afrikaans and English students could do their tasks in their home language, with the translation in the additional language, while isiXhosa speakers had a choice to do their tasks in English, with the translation to Afrikaans, or in Afrikaans, with the translation to English.

A task-based activity was designed where MobiLex could be integrated in the class. The lecturer mentioned MobiLex as a possible resource and the activity was handed out to the students. No demonstration was provided and students had the choice of using MobiLex to complete their tasks. An opportunity for constructivist (where students could construct their own learning) and mobile learning was created.

In order to integrate mobile learning effectively in the lecture hall environment, typical dictionary functions were assigned to the task. The questions as well as dictionary functions associated with them are listed as follows:

(1) Definition matching. Match the term supplied (e.g. *humanism*) with a suitable description of the term (supplied). (specific data on the subject field – cognitive dictionary function)

(2) With which figures in history would you associate the concept of absolutism? When and where did they live? (encyclopedic data – cognitive dictionary function)

(3) Which movement was formed in reaction to modernism?   (encyclopedic data – cognitive dictionary function)

(4) Describe what you understand under the word "neo-fascist". (specific data on the subject field – cognitive dictionary function)

(5) What would be the use of oral history for historians? (specific data on the subject field – cognitive dictionary function)

(6a) What would you consider to be the difference between primary and secondary sources? (specific data on the subject field – cognitive dictionary function)
(6b) Give an example of a primary and a secondary source. (specific data on the subject field – cognitive dictionary function)

(7) Would you consider the story of Racheltjie de Beer to be a myth? Substantiate your answer. (encyclopedic data – cognitive dictionary function)

(8) Supply a synonym (a word with the similar meaning) for:
evidence, narrative, franchise (data on language – cognitive dictionary function)

(9) Supply an antonym (a word with opposite meaning) for:
localisation (data on language – cognitive dictionary function)

(10) Supply the Afrikaans translation for the following terms:
commemorate, heritage, franchise (communicative dictionary function)

(11) Translate the following text into Afrikaans:
During the 17ᵗʰ century the governments of Europe were characterised by absolute rulers who wielded complete and unlimited power. Proponents of individual freedoms questioned this system under the banner of Liberalism. Governmental assurance of civil liberties is taken for granted in our modern democracies where sovereign power resides in the people. (communicative dictionary function)

Questions (1-7) are aimed at concept development, the understanding of concepts and application of encyclopedic knowledge of terms, whereas questions (8-9) are aimed at understanding the semantic relations between concepts. Questions (10-11) are about the translation of texts, with the target language an additional language of the student. This is a very relevant task within the framework of multilingualism, as students are often confronted with texts in text books, journals and lectures that are not in their home language.

A section on reflection on the use of MobiLex was added to the task.

Reflection on the use of MobiLex

Answer the following questions after you have completed the task.

(1) Difficulty of task: how difficult was the task on a scale of 1 to 5 (1=easy – 5=difficult)?
(2) Dictionary use: did you make use of MobiLex during the task?
(3) Underline the words in the text (in Question 11) which you had problems with.
(4) Write down all the words you looked up in MobiLex. Usefulness of dictionary definitions: did you find the dictionary definitions in MobiLex meaningful on a scale from 1 to 5?
(5) Usefulness of dictionary definitions: did you find the dictionary translations in MobiLex useful on a scale from 1 to 5?
(6) What recommendations would you make to other participants in the task to answer the questions successfully?
(7) Reflection on reference process: how would you describe it ? Was it successful?

Students were asked to reflect on their experience of MobiLex by means of statements on a Likert scale ranging from 1 to 5. (Results of the tasks will be analyzed and will be presented in a forthcoming paper).

With the task mobile learning was employed in various ways. It was learner-centred, as students had to construct some of the content as part of their learning. Constructivist learning could take place where students had the opportunity to build up new concepts, using MobiLex. Behaviourist learning took place where quick feedback was facilitated with a mobile device at hand, for example where a student had an idea of a concept, but wanted to make sure if that concept was correct (During the task some students were quite dependent on MobiLex and used it to check every question, where others did not make use of it at all). Situated learning took place with smartphones been used in the

lecture hall to facilitate learning where MobiLex was used for language support during translations, for example.

6. Conclusion

With an ever increasing connectivity sweeping around the globe, mobile learning is much more present and it should be used to facilitate different kinds of learning. It is an expanding field of research and practice. Also in the field of lexicography, with the notion of the user perspective in mind, the possibilities and opportunities for mobile dictionaries should be recognized and utilized.

Mobile dictionaries have an important pedagogical part to play in the development of content vocabulary as well as academic literacy deemed necessary to achieve success in higher education. Students aspire to become subject experts and they need content-driven vocabulary to cope academically. Such dictionaries have to be designed, with the user in mind, with appropriate dictionary structures, so that meaningful learning could take place, also in a multilingual environment. Such dictionaries should also be used to fulfil the pedagogical needs of the appropriate target user group in a learning environment.

It was demonstrated in the paper how dictionary structures and dictionary functions could potentially be used by the appropriate user in an integrated pedagogical environment for successful mobile learning.

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