

Emerging Vocabulary Learning: From a Perspective of Activities Facilitated by Mobile Devices

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Abstract

This paper examines the current mobile vocabulary learning practice to discover how far mobile devices are being used to support vocabulary learning. An activity-centered perspective is undertaken, with the consideration of new practice against existing theories of learning activities including behaviorist activities, constructivist activities, situated activities, collaborative activities and informal and lifelong activities. Such an approach allows one to reflect on the advantages of L2 vocabulary learning and to hypothesize what features of this technology are likely to change language teaching and learning. The integration of mobile devices and vocabulary learning needs to take into consideration portability, social interactivity, context sensitivity, connectivity and individuality. Insights gained from the categorization of activity type will inform researchers and teachers of the emerging vocabulary learning practice and its potential relevance to the innovation in language language teaching and learning.

Keywords: mobile learning, vocabulary learning, learning theories, activity types

1. Introduction

The prevalent use of mobile devices such as mobile phones is beginning to have an impact on how students learn, especially in the case of foreign language learning. These portable and readily-available devices offer more opportunities to improve student' retentions and achievement, and support different needs of the younger digital generation. Moreover, with a mobile device, learners are more likely to have the option of mobile access to electronic learning materials, resources and people. Mobile learning promises to deliver closer integration of language learning with everyday communication needs and cultural experience (Kukulska-Hulme, 2006). Therefore, mobile devices are deemed as efficient tools for language learners with additional support for comprehension and communication and also accommodate different learning styles.

An overview of the publications reporting mobile-assisted vocabulary learning is undertaken to discover how far mobile devices are being used to support vocabulary learning. These explorative studies (Kiernan & Aizawa, 2004; Beaudin et al., 2007; Cavus & Ibrahim, 2009; Chen & Li, 2010; Nwaocha, 2010; Wong et al., 2010) drawn from different contexts can be examined for their potential relevance to the new practice in language learning. Until now, numerous mobile vocabulary studies which employ the various functions of mobile technology have been conducted in different contexts and for different purposes and it pays to examine them comprehensively and then advance the mobile learning design. In particular, reflection is necessary on the unique properties of mobile vocabulary learning in order to predict directions for the future and inform practitioners of the possibilities of mobile devices utilized in the field of language learning. Different from the previous review of mobile learning studies, this paper examines accounts of mobile vocabulary learning practice from educational theory, specifically, the perspective of the activities initiated by the specific mobile vocabulary learning design. According to Hartnell-Yong (2007), educational theories rather than technologies will have influence on learning activities design (cited in Petrova & Li, 2009). In other words, solely reliance on technology itself will not transform learning. What is needed is to examine whether the available and acceptable technology is justifiable

in a particular educational context. Therefore, the classification of studies in the framework of learning activities in this paper is intended to offer ideas about the merits and drawbacks of each particular activity. Through the exploration of the various mobile vocabulary learning activities, this paper aims at offering guidelines for the activity designs and address the relationship between teachers and learners mediated by the mobile technology.

This paper firstly deals with the inception and development of mobile vocabulary studies and then classify the present mobile vocabulary designs into different activity types, i.e., behaviorist activities, constructivist activities, situated activities, collaborated activities as well as informal and lifelong learning activities. Then implications of such a view of mobile vocabulary learning are discussed for future vocabulary learning design via mobile devices.

2. Mobile Vocabulary Learning

Vocabulary is a fundamental component of foreign language acquisition. A minimal amount of vocabulary is indispensable for effective communication. Wilkins (1972) argued that “Without grammar very little can be conveyed, and without vocabulary nothing can be conveyed”. Therefore, vocabulary is considered the building block for the capacity of communication. Zhang, H., Song, W., & Burston, J. (2011) have reviewed previous vocabulary studies and categorized them into studies with technology and those without technology. The majority of the studies explores vocabulary learning from the perspective of mnemonic devices, learning strategies, the impact of reading, the role of context, as well as syntactic and thematic analysis.

Technological advances provide more possibilities and chances to enhance vocabulary learning. As Ellis (1995) argued, “CALL has numerous roles in the general training of explicit skills for memorizing the meaning of vocabulary, and in the particular presentation of mnemonic mediators for specific items of vocabulary”. He also emphasized the basic educational role of computers as programmed providers of drill, practice, and test. Currently an important strand of researching vocabulary learning is the exploration of mobile assisted vocabulary acquisition. The mobile devices have multiplied the opportunities to access learning resources. Another obvious function of mobile devices is the way they facilitate contextual learning, i.e. allowing the information available in learners’ location, relevant to their needs, to be captured or delivered in context (Kukulka-Hulme, 2006). If the acquisition of the new vocabulary items occurs at the right time and right place, learners will understand and use what they have learned with less effort.

Before we start to look at the mobile vocabulary learning projects described in the published studies, it is necessary to clarify what we mean by “mobile learning” since the concept has developed rapidly and there are different understandings. At the stage of infancy, researchers defined mobile learning from different perspectives. Geddes (2004) defined mobile learning as the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime that results in an alteration in behavior. Mobile learning is considered as the application of mobile or wireless devices for learning when the learner is moving. Thus, flexible, accessible and personalized learning activities are considered as the advantages provided by mobile learning. Sharples (2006) and Laurillard (2007) argued that a typical m-learning activity could offer more opportunities for digitally-facilitated site-specific activities, and for ownership and control over what the learners do. With regard to this remark, mobile devices are beneficial to enhance continuity and spontaneity of access and interaction across different contexts.

The early research in relation to the concept of mobile learning was closely related to devices and the potential for enabling lifelong learning. It soon became clear that rather than focusing on the device, research should be on the mobility of the learner. Mobile assisted language learning characterizes the use of personal, portable devices that enable new ways of learning, emphasizing continuity or spontaneity of access and interaction across different contexts of use.

...the mobile technology, while essential, is only one of the different types of technology and interaction employed. The learning experience cross spatial, temporal and/or conceptual borders and involve interactions with fixed technologies as well as mobile devices. Weaving the interaction with mobile technology into the fabric of pedagogical interaction that develops around them becomes the focus of attention.

(Kukulka-Hulme et al., 2009)

Mobile devices have brought a vast number of learning possibilities which are convenient and compatible to the mobile lifestyle. Mobile technology can support quick feedback or reinforcement; immersive experiences such as mobile investigations or games; situated learning in an authentic context; access to information while moving around a specific environment; information sharing in collaborative learning; record keeping in informal and lifelong learning; and coordination of learning and resources (Kukulka-Hulme et al., 2004). Mobile devices are

best viewed as mediating tools in the learning process during which the learners, teachers and content interact with each other. Kukulska-Hulme (2006) has predicted that language learning may be a fruitful area for informal learning with mobile devices.

Mobile devices have numerous advantages in language learning. In many cases, such devices are readily available. The portability is another obvious benefit. They can be easily accessed in the classroom or outside of classroom. Learners can study manageable chunks of information in any place on their own time, thereby taking advantage of their convenience. Researchers at Stanford Learning Lab envisioned that a good approach would be to fill the gaps of time by short (from 30 seconds to 10 minutes) learning modules in order to use the highly fragmented attention of the user while on the move.

One of the most straightforward applications of mobile devices for the educational purpose is text message. The greater mobility and lower cost of mobile phones compared to the computer mean that more people can afford to make use of this technology. The application of SMS assisted vocabulary learning would be highly practical and convenient for language learners. The practicality and convenience are beneficial for learning in and out of school context. Meaningful vocabulary learning occurs only when the learning process is integrated with social, cultural and life contexts (Chen & Li, 2010).

To gain insights in the potential of mobile vocabulary learning, it is necessary to examine the previous studies. A thorough and focused examination of the empirical studies is urgently needed. Cheung & Hew (2009) argue that a methodological review not only helps identify the contemporary topics, research methodologies and the usage of mobile devices, but suggest directions and guidelines for future research. Their study, however, cover issues in the whole educational setting, and thus the discussions concerning vocabulary learning is limited and less in-depth. Another review focuses solely on text-message vocabulary learning and summarizes the advantages and disadvantages of this particular mobile function, but it fails to capture the other practical applications of mobile devices, which may bring about the fundamental changes (Derakhshan & Khodabakhshzadeh, 2011). Therefore, this paper aims at bridging the gap of the previous reviews and takes into consideration various vocabulary learning activities facilitated by mobile devices, so as to take advantage of vocabulary learning and teaching mediated by mobile devices.

3. Activities of Vocabulary Learning Facilitated by Mobile Devices

Mobile learning, as an emerging branch of learning, will shed more light on the understanding of the learning process that brings together cognitive, emotional, and environmental influences and experiences for acquiring, enhancing, or making changes in one's knowledge, skills, values, and world views (Illeris, 2004). Learning theories will help describe how this procedure occurs, interpret the examples observed and suggest solutions to practical problems. A theoretical classification of mobile vocabulary learning activities will draw our attention to the crucial factors for the design and application of mobile affordance.

In this section, case studies are discussed in terms of the activities that can be enabled through the use of mobile phone. The classification of activities in this paper is based on the main themes mentioned in Literature Review on Mobile Technologies and Learning (Naismith et al., 2004) and the five categories related to vocabulary learning are behaviorist activities, constructivist activities, situated activities, collaborative activities, informal and lifelong activities.

3.1 Behaviorist Activities

Behaviorist activities constitute the basic mobile vocabulary learning designs in the early stage of mobile learning projects. In the behaviorist paradigm, learning is thought to be best facilitated through the reinforcement of an association between a particular stimulus and a response (Naismith et al., 2004). Various functions of the mobile devices act as a medium for stimulating such a response. The content delivery by text messages is often used in the behaviorist research design. Specifically, learners receive specific content and provide instant feedback via mobile phones. The vocabulary learning designs underpinning this mode take advantage of the unique features of mobile devices: portability and mobility, which help learners get access to the learning contents out of schools.

Students learn more effectively when exposed to spaced-repetition of vocabulary than massed repetition. The projects (Thornton & Houser, 2005; Cavus & Ibrahim, 2009; Nwaocha, 2010) integrating text message and vocabulary learning were generally well received. The success of such vocabulary learning is mainly due to the "push media" effect, which promote frequent rehearsal and spaced study, and utilize recycled vocabulary (Thornton & Houser, 2005). This spacing effect is considered as the major contributor to enhancing vocabulary learning via text-messaging (Derakhshan & Khodabakhshzadeh, 2011). In terms of the memory effect, the items

presented and then immediately repeated (massed practice) are not as good as those repeated after a period of time. In the latter case, vocabulary items monitored by mobile devices can help deliver regular and repeated learning content and such frequent encounter with new items at spaced intervals, and in a variety of contexts, tend to enhance memory. The long-term effect of the spaced learning, however, is still open to discussion, and need further testing and research. As both traditional vocabulary learning and mobile vocabulary learning have their innate advantages and disadvantages, a blended approach is recommended for learners to meet their particular needs (Zhang et al., 2011).

3.2 Constructivist Activities

In the constructivist learning framework, learners live in an ever-changing social, cultural, and technological environment, and their learning is a constructive process of acting within an environment and reflecting upon it. Learners are encouraged to discover principles for themselves and construct new ideas or concepts based on both their previous and current knowledge (Naismith et al., 2004). Thus, they need not only an environment where they can participate in the learning process but effective tools for that knowledge. Mobile devices offer a unique opportunity for learners to construct knowledge and share it with peers by interacting in a naturalistic context and getting access to supporting tools for their learning.

A study (Wong et al., 2010) examined learner-created content and contextualized meaning making via mobile phones in a Singaporean primary school. These pupils were encouraged to create various forms of authentic use of Chinese idioms. The meanings of idioms are context dependent. When discussing the role of instruction in language acquisition, Ellis (2005) argued for the focus on meaning which entails semantic meaning and pragmatic meaning. Such practical meanings are highly contextualized and arise in acts of communication. Therefore, it is difficult to capture context dependent vocabularies such as idioms and proverbs in a simple definition. In this case, it is the mobile affordance of the immediate data collection that offers learners opportunities to visualize the idiom-and-context association. Those shared digital artifacts collected by the learners via mobile phone are the key to achieving a profound understanding of the idioms and the online discussion expanded their social learning space with rapid artifact revision and interaction. The blended use of mobile phones and Web 2.0 technologies provided the learners with the opportunity to share learner-created content in authentic environments.

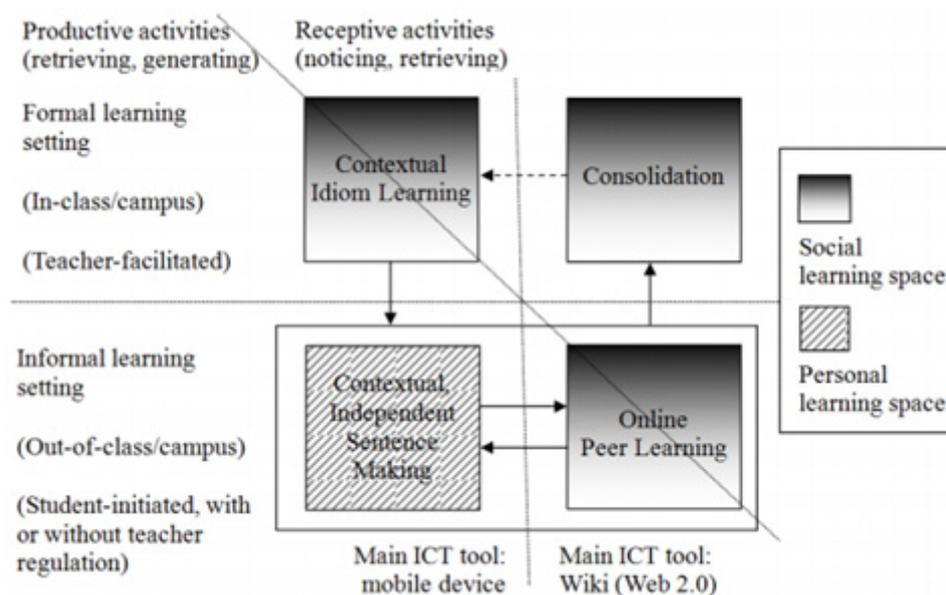


Figure 1. The mobile-assisted idiom learning process (Wong et al., 2010)

Figure 1 (Wong et al., 2010) conceptualizes the process of the learning design. The four-activity process include formal and informal learning settings, individual and social learning spaces, receptive and productive activities, and the use of both mobile and Web 2.0 technologies (i.e., learning takes place in both the physical world and the cyberspace). This conception examines the tool-mediated social-cultural activity in and out of the formal

educational settings and bridges the gap between formal and experiential learning (Kukulka-Hulme et al., 2009).

The combination of the mobile and Web 2.0 technologies enable students to experience a holistic language learning integrating their learning experience in both physical and cyberspace contexts. In this design, the personal and social meaning making activities provide learners with opportunities beyond the formal learning environment, expand the learning process into students' daily life. During the process, comparisons and contrasts of similar student artifacts for the knowledge co-construction are highlighted. Thus, students not only engage themselves in watching idiomatic animations but extend vocabulary learning to social learning.

3.3 Situated Activities

The situational learning approach has proposed that "context" is an important factor in language learning, capable of enhancing learning interest and efficiency. The authentic context itself appears to be part of education resources. To achieve the goal of creating authentic context, situated learning experience can be realized via three manners, namely, problem-based learning, case-based learning, and context-aware learning (Naismith et al., 2004). Knowledge gained from the interaction in any of the above three manners reduces the learning time and enhances efficiency and retention. Specifically, the words learnt from a specific context will enable learners to naturally understand the meaning and use the words appropriately. The various contexts, coupled with diverse individual differences such as the different needs and aptitudes, make it difficult in practice for most teachers to design lessons which meet the needs of the students.

With the advancing technology, context-aware mobile learning systems can support learning activities without constraints of time or place, associate learning activities with real learning environment and extend learning into the interaction of daily life. The up-to-date mobile technologies featuring context awareness are capable of facilitating the individualized learning process. Context awareness means gathering information from the environment to provide a measure of what is currently going on around the user and device (Naismith et al., 2004). As mobile phones are readily available in different contexts, they are the best choice for context-aware applications. Understanding and supporting learning in context is a key to integrating context-aware mobile devices and language learning. The dimension of the context may include individual difference and the specific time and location for their learning. The up-to-date mobile tools take advantage of "the situated and immersive learning where learners interact with their immediate surroundings and adapt the learning experience to personal needs" (Kukulka-Hulme, 2010). A mobile learning environment is designed on users' current knowledge state, their location, their ability to concentrate at that location, the likelihood that they will be interrupted, and the amount of time they have for learning (Cui & Bull, 2005). It is conceivable that context-aware mobile technology has a significant role to play in the mobile language learning.

A project designed by (Chen & Li, 2010) utilized a personalized context-aware ubiquitous learning system (PCULS) for learning vocabulary based on the learners' location as detected by wireless positioning techniques, learning time, individual English vocabulary abilities and leisure time. Such context-aware mobile devices enable learners to be exposed to learning content adapted to their needs and support English vocabulary learning in the school environment.

To further investigate learners' perception of context-aware learning mode in the experimental group against the non-context-aware learning mode in the control group, all students in the control group were provided with proposed PCULS for one week after finishing their learning activity and post-test. Therefore, these students experienced both learning modes (i.e. without and with context-aware service). The result indicated that 72.2% of learners preferred to use the proposed PCULS for learning English vocabulary. Besides, 94.4% of learners favored the proposed system with context-aware service because it could promote their learning motivation and help learners gain a deeper impression of vocabulary than the same system without context-aware service.

3.4 Collaborative Activities

Collaborative activities enhance learning through social interaction. Such learning experiences are initiated as a learning process with proper social interaction. Specifically, mobile devices add another dimension for learners to interact with others, sharing data, files and messages. Mobile technologies overcome the weaknesses of collaborative learning undertaken without technology with regard to coordination, communication, organization, negotiation, interactivity and mobility encountered in (Kukulka-Hulme et al., 2009; Zurita and Nussbaum, 2003). These devices are also typically used in a group setting, and so interactions and collaboration are very likely to take place. According to Nah, White & Sussex (2008), these collaboration activities can be effectively "initiated by such mobile functions as SMS, mobile email, mobile discussion boards, and mobile messengers" (cited in Derakhshan & Khodabakhshzadeh, 2011). Mobile phones offer a collaboration platform

beyond the formal school setting.

Another study (Kiernan & Aizawa, 2004) of mobile phones in classroom information gap tasks are designed to promote interaction among learners with target vocabulary assessed in pretest and posttest. Though the mobile learners kept their messages to a minimum, they were able to collaborate and communicate effectively so as to complete the tasks given. The authors argue that the functional capability of the mobile phones is likely to enhance the interaction and collaborations among the learners who have limited communication proficiency. Effective interaction facilitates language acquisition when learners get the input and engage in negotiation and feedback (Long, 1996). During the collaboration process, either through pre-programmed software or interaction with peers or instructors, learners are provided with opportunities of negotiation of meaning as well as comprehensible input.

3.5 Informal and Lifelong Activities

Mobile learning provides opportunities for informal learning. It is acknowledged that people engage in informal learning more than any other kind of learning as shown in the figure 2 (http://en.wikipedia.org/wiki/Informal_learning). The personal and portable nature of mobile devices enhances learning that takes place beyond formal education. Research on informal and lifelong learning recognizes that learning happens all the time and is influenced both by our environment and the particular situations we are faced with. Eraut (cited in Naismith et al., 2004) classifies “non-formal” learning activities along a continuum from deliberate learning to accidental learning such as through TV, newspapers and conversations. To some extent, mobile devices, which are considered the best tools for recording, reflecting on and sharing informal learning, facilitate instant information acquisition in a seamless and unobtrusive way, and therefore, mobile learning is particularly suitable for informal and lifelong learning experience.

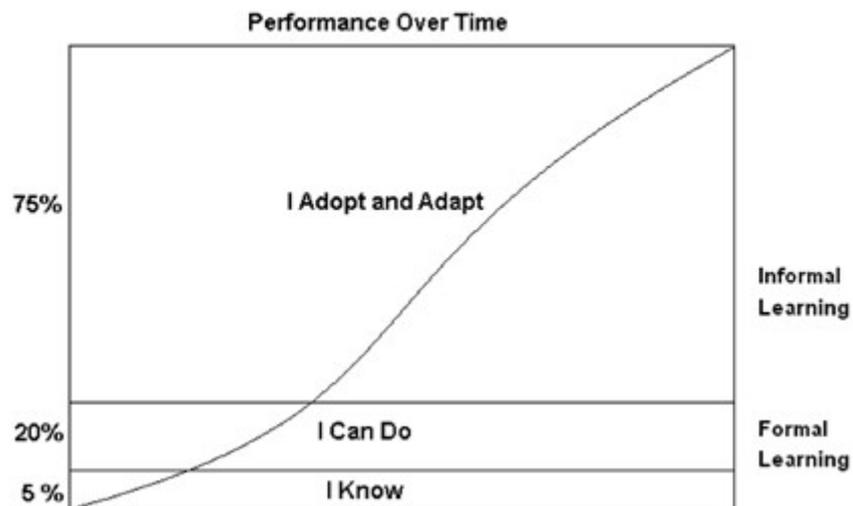


Figure 2. A study of time to performance by Sally Anne Moore

Cavus & Ibrahim (2009) investigated the use of wireless technologies in education with particular reference to the potential of learning new technical English language words using SMS text messaging. This regularly-delivered intensive content represents a form of deliberate learning beyond the classroom context and such activities aim at vocabulary development predominantly. The system, called mobile learning tool (MOLT) in their design, has been tested with 45 1st-year undergraduate students. The knowledge of students before and after the experiment has been measured. The results show that students enjoyed and learned new words with the help of their mobile phones. Therefore, using the MOLT system as an educational tool expands the learning experience into the informal setting and particularly contributes to EFL language learners' achievement.

Vocabulary learning may occur in the informal learning environment. Incidental vocabulary learning is the major type. Incidental vocabulary learning creates opportunities for inferring word meaning in context, enables vocabulary acquisition and reading at the same time, and is more individualized and student-centered (Derakhshan & Khodabakhshzadeh, 2011). For example, a study designed by Song & Fox (2008) in Hong Kong discusses how college students integrate incidental vocabulary learning into their academic studies. Such an incidental learning design is significant in helping EFL researchers and teachers understand students' needs

and strategies in coping with vocabulary learning difficulties. This three-case research develops a diagram of PDA uses for undergraduates' incidental vocabulary learning in the academic studies.

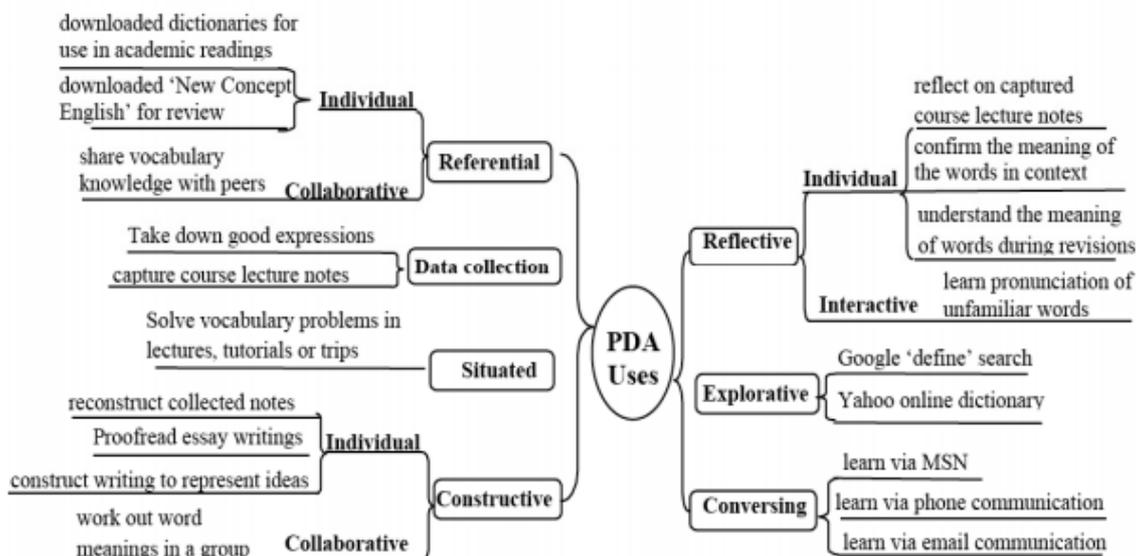


Figure 3. Diagram of PDA uses for incidental vocabulary learning (Song & Fox, 2008)

In figure 3, we can see that mobile devices have been used to support informal learning (both deliberate and accidental) in the educational context. These students employed various tools for data collection, situated, constructive, reflective, explorative and conversing uses. Their use of technology has influenced vocabulary learning activities, and vice versa. Therefore, administrators and teaching staff within institutions are increasingly acknowledging and corresponding to external factors and internal factors (such as student preference, staff capabilities and pedagogical approaches). Besides, the decreasing costs of the mobile and wireless access are increasingly favorable compared with the maintenance of on-campus computer facilities (Cobcroft, Towers, Smith, & Bruns, 2006). The acceptance of mobile device will promote the informal learning practice.

What is more significant is that the potential of mobile devices relates to lifelong learning. An explorative experiment was designed by Beaudin et al. (2007) in which two adults were facilitated with mobile system. Their result suggests that the repeated exposure of context-sensitive interactions relieves the burden of learning. Thus, the adult learners were inclined to see the vocabulary learning tasks as less daunting and their interest in vocabulary learning was sustained.

Mobile phones lend itself to variety of learning activities, namely, behaviorist activities, constructivist activities, situated activities, collaborative activities, informal and lifelong activities. The above cases provide us with insight in the potential of mobile phones in facilitating vocabulary learning.

4. Discussion

The five learning activity types classified above enable us to know better what happens on the learners' part. Such discussion enables us to understand what experience, behaviorally, cognitively, psychologically or socially, can be triggered during the mobile vocabulary learning process. It will bring more constructive ideas to mobile learning design if understanding of another dimension added – role of the teacher in the mobile learning design. The relationship between the five types of mobile vocabulary learning activities and the role of the teacher is briefly discussed below.

The teachers' perspective is important for examining the pedagogical model because they are responsible for directing an activity and how much freedom the learners have. When addressing the pedagogic models via mobile device, McFarlane, Roche and Triggs classified three main "emerging models of use", namely, teacher-directed activity, teacher-set activity and autonomous learning activity (cited in Kukulska-Hulme, 2010). Although it is not easy to separate distinct models, it is possible to recognize a continuum, with teacher-led

activities at one end and learner-driven ones at the other. This continuum provides us with different lens to examine the activity types of mobile vocabulary learning design classified in this paper. The behavioral activities are more teacher-directed while the constructivist activities, situated activities and collaborative activities are generally teacher-led because “teacher sets the task and the general outcome, but the processes and format of the outcome are largely defined by the learner” (Kukulska-Hulme, 2010). The informal and lifelong ones correspond to autonomous learning activities because learners perform mobile learning tasks unasked. In this sense, mobile technology can be a catalyst for learners to initiate new models of learning.

In a word, the understanding of the three models and five activity types is conducive to the mobile vocabulary design. Having examined the particular needs of the target learners, the teacher or designer need take into consideration the extent to which the role they will play before and during the mobile learning experience. The behavioral mobile vocabulary designs are often teacher-directed and content-rich. The teacher controls the pace and volume of new lexical items with regard to the particular group of learners. In this model, the learning material can be delivered to the learners but there is no guarantee that the learners will act as intended. Constructive learning, situated learning and collaborative provides authentic context for the knowledge and knowing. In such authentic context, social interaction and collaboration occur. If vocabulary learning is designed to be integrated into interaction, learners will pay attention to the meaning as well as the form. Hence, meaning-driven interaction generates true communication. In this way, vocabulary learning is less discouraging and painstaking for the learners. As for autonomous learning activity, self-initiated and sometimes innovative learning are encouraged. Especially those motivated and advanced learners are more likely to take initiatives to integrate mobile technologies with their daily life including study.

Having examined the relationship between the teacher and the five learning activities categorized here, teachers or educators shall focus on one of the above three models of use or integrate them in the mobile vocabulary learning design with the special regard to the particularity of the target learners.

The above section discussed vocabulary learning on the basis of activities enabled through the use of mobile devices with reference to the role of teacher. A further dimension of mobile enhanced vocabulary learning can be explored from the point of view of the personal and portable nature of the device, coupled with the interaction with other learners and environment. Klopfer et al. (cited in Naismith, Lonsdale, Vavoula, & Sharples, 2004) identify five properties of mobile devices which provide the unique educational affordance, namely, portability, social interactivity, context sensitivity, connectivity, individuality.

These features are closely related to the above mentioned activities stimulated in the mobile learning process and, therefore, are essential consideration for designing and implementing mobile language learning. The mobility of learners can help learners gain new knowledge, skills and experience as “learning is a cumulative process involving connections and reinforcement among a variety of learning experiences, across formal and informal learning context” (Kukulska-Hulme et al., 2009).

The combination of understanding of context and activities engaged in the mobile learning is necessary for the successful mobile learning design. Context of mobile learning is considered as an important construct, but its connotation varies among researchers. Kukulska-Hulme & Wible, (2008) classify the theoretical work on context according to two perspectives: pedagogical and technological. The pedagogical perspective examines the flexible and learner-generated context in relation to mobile learning while the technological perspective refers to integrating the personalized interaction and adaptive content with context identification and detection technologies. From a technological perspective, consensus has not been made on whether context can be isolated and modeled in a computational system, or whether it is an emergent and integral property of interaction (M. Sharples, 2006). Therefore, such a view is not likely to offer much insight for the mobile learning practices. Another study (Vavoula, Pachler, & Kukulska-Hulme, 2009), however, has further classified context into six types, including temporal context, social context, situational context, educational context, activity context and historical context. As it can be seen, context is a multi-dimensional construct and can be approached from the above mentioned six dimensions. However, the analysis of any dimension can not be isolated from each other. Such a classification broadens our understanding of context and the focus on a particular context will yield more context-specific applications. Traxler (2007) claim that mobile technologies can support diverse teaching and learning styles and lend themselves particularly well to personalized, situated, authentic and informal learning (cited in Kukulska-Hulme et al., 2009). Thus, how to construct helpful context to meet diverse needs and goals of teaching and learning pedagogically and technically, is seen as the key to the effective mobile language learning applications.

The above reflection of context facilitates researchers and educators to design mobile learning activities with

focus on mobility, awareness of contexts, temporal, social, situational, educational etc, which are genuinely important factors for the adoption of mobile technologies. In the meantime, understanding of the activity types helps educators adopt appropriate activity for learners in a particular context.

When dealing with technologies, human nature should be firmly anchored at the center of the developments. Mobile technology is proving to be a fertile ground for innovation, but it is important to realize that the success of mobile learning will depend on human factors in the use of the new mobile and wireless technologies. It is conceivable that more practice of mobile learning on a larger scale, and with diverse populations of students involved will enable us to have a deeper understanding of this field.

However, the role of mobile devices in language learning should not be overstated. Colpaert (2004) emphasizes the importance of developing the language learning environment before deciding on the role of mobile technologies and further emphasizes focusing on the learner ahead of technology. The above comment on the relationship between technology and learning imply that technology is not the solution to all the difficulties in learning.

Another issue that the instructor ought to bear in mind is the learners' preparedness for mobile learning. It may take longer time than we expect to integrate mobile learning and language learning. Wang and Higgins (2006) pointed out that the barriers that limit the use of mobile phones for language learning are technological, pedagogical and psychological. They argue that it is time-consuming for learners to embrace new technologies, and it is not possible to expect all learners to accept the new learning mode at the same rate. In a survey about the integration of SMS into learning, Petrova & Sutedjo (2004) conclude that specific learners' needs and their learning style are the major considerations for the mobile-assisted learning. Therefore, further understanding of the preferred communication modes such as frequency and the most suitable time for mobile learning activity is necessary for identifying the most efficient and potentially successful applications of mobile learning.

5. Conclusion

This paper is aimed to reflect on the impact of mobile learning on the process of L2 vocabulary learning and on what is likely to change how languages are taught and learnt. Advantages such as mobility, portability and context-awareness will change learning. By looking at the examples of mobile vocabulary learning, we can get a closer understanding of mobile learning experiences and role of the teacher, and reflect the relationship between them so as to design new learning projects which are highly situated, personal, collaborative and long term.

It can't be denied that mobile devices are finding their way into language classrooms. Kukulska-Hulme (2006) argues that those who conduct new design for language learning should bear in mind context, continuity and openness to the unexpected. It is true of vocabulary learning, which is considered the foundation for language learning. The categories presented in this paper will provide guidelines for those who want to integrate mobile technologies into language teaching and learning. Specifically, the learners' experience with regard to learning theory and the role of teachers are indispensable factors for guaranteeing the success of the mobile vocabulary learning design.

The categorization and discussion of the current mobile vocabulary designs provide further understanding of mobile learning experience and the role of the teacher. Such a stance is intended to narrow the gap between the mobile learning practice and potential mobile vocabulary learning design. As is predicted, the potential of mobile technology for the next generation will change daily activities by capturing details about the time, location, people, and consequently the future learning will involve making rich connections within these environments to both resources and to other people.

References

- Beaudin, J., Intille, S., Munguia Tapia, E., Rockinson, R., & Morris, M. (2007). Context-sensitive microlearning of foreign language vocabulary on a mobile device. *Ambient Intelligence*, 55-72.
- Cavus, N., & Ibrahim, D. (2009). M-Learning: an experiment in using SMS to support learning new English language words. *British Journal of Educational Technology*, 40(1), 78-91.
- Chen, C.-M., & Li, Y.-L. (2010). Personalized context-aware ubiquitous learning system for supporting effective English vocabulary learning. *Interactive Learning Environments*, 18, 341-364. <http://dx.doi.org/10.1080/10494820802602329>
- Cheung, W. S., & Hew, K. F. (2009). A review of research methodologies used in studies on mobile handheld devices in K-12 and higher education settings. *Australasian Journal of Educational Technology*, 25(2), 153-183.

- Cobcroft, R. S., Towers, S. J., Smith, J. E., & Bruns, A. (2006). Mobile learning in review: opportunities and challenges for learners, teachers, and institutions. *Proceedings Online Learning and Teaching (OLT) Conference 2006*, pp. 21-30, Queensland University of Technology, Brisbane.
- Colpaert, J. (2004). From courseware to coursewear? *Computer Assisted Language Learning*, 17, 261-266.
- Cui, Y., & Bull, S. (2005). Context and learner modeling for the mobile foreign language learner. *System*, 33(2), 353-367.
- Derakhshan, A., & Khodabakhshzadeh, H. (2011). Why CALL why not MALL: an in-depth review of text-message vocabulary learning. *Theory and Practice in Language Studies*, 1(9), 1150-1159.
- Ellis, R. (2005). *Analysing learning language*. Oxford: Oxford University Press.
- Geddes, S. (2004). Mobile learning in the 21st century: Benefit for learners. *The Knowledge Tree*. Retrieved from February 13, 2011, from http://flexiblelearning.net.au/knowledge/tree/edition06/html/prs_simon_geddes.html
- Illeris, Knud. (2004). *Three dimensions of learning*. Malabar, FL: Krieger Publishing.
- Kiernan, P. J., & Aizawa, K. (2004). Cell phones in task based learning -are cell phones useful language learning tools? *ReCALL*, 16. <http://dx.doi.org/10.1017/S0958344004000618>
- Kukulka-Hulme, Agnes. (2004). Usability: a common theme for developments in e-Learning at the UK Open University. *International Journal of Distance Education Technologies*, 2(3), i-vi.
- Kukulka-Hulme, A. (2006). Mobile language learning now and in the future. In Svensson, Patrik ed. *Från vision till praktik: Språkutbildning och Informationsteknik (From vision to practice: language learning and IT)*. Sweden: Swedish Net University (Nätuniversitetet), pp. 295-310.
- Kukulka-Hulme, A. (2010). Learning cultures on the move: where are we heading? *Educational Technology & Society*, 13(4), 4-14.
- Kukulka-Hulme, A., Sharples, M., Milrad, M., Arnedillo-Sánchez, I., & Vavoula, G. (2009). Innovation in mobile learning: a European perspective. *International Journal of Mobile and Blended Learning*, 1(1), 13-35.
- Kukulka-Hulme, A., & Wible, D. (2008). Context at the crossroads of language learning and mobile learning. *ICCE 2008 Workshop Proceedings*, 27-31 October 2008, Taiwan.
- Laurillard, D. (2007). Pedagogical forms of mobile learning: framing research questions. In Norbert Pachler (Ed), *Mobile Learning: Towards a research agenda*, Occasional papers in Work-based Learning, I, WLE Centre, Institute of Education, London.
- Naismith, L., Lonsdale, P., Vavoula, G., & Sharples, M. (2004). Literature review in mobile technologies and learning. *FutureLab Report*, 11.
- Nwaocha, Vivian Ogochukwu. (2010). SMS-based mobile learning system: a veritable tool for English language education in rural Nigeria. MobileActive.org. Postgraduate strand at ICTD2010. Retrieved from <http://www.mobileactive.org/research/sms-based-mobile-learning-system-veritable-tool-english-language-education-rural-nigeria>
- Petrova, K., & Suttedjo, Y. (2004). Just-in-time learning: ready for SMS? *IADIS International Conference on Cognition and Exploratory Learning in Digital Age (CELDA)*, 15-17.
- Sharples, M. (2006). Big issues in mobile learning. report of a workshop by Kaleidoscope Network Excellence Mobile Learning Initiative (pp. 41-52). University of Nottingham, UK. Retrieved from mlearning.noe-kaleidoscope.org/repository/BigIssues.pdf (June 20, 2011)
- Song, Y., & Fox, R. (2008). Using PDA for undergraduate student incidental vocabulary testing. *ReCALL*, 20. <http://dx.doi.org/10.1017/S0958344008000438>
- Thornton, P., & Houser, C. (2005). Using mobile phones in English education in Japan. *Journal of Computer Assisted Learning*, 21(3), 217-228.
- Vavoula, G., Pachler, N., & Kukulka-Hulme, A. (2009). *Researching mobile learning: frameworks, tools and research designs*. Peter Lang.
- Wang, S., & Higgins, M. (2006). Limitations of mobile phone learning. *CALL Journal*, 2(1), 3-14.
- Wilkins, D. A. (1972). *Linguistics in language teaching*. London: Edward Arnold.

- Wong, L. H., Chin, C. K., Tan, C. L., & Liu, M. (2010). Students' personal and social meaning making in a Chinese idiom mobile learning environment. *Educational Technology & Society*, 13(4), 15-26.
- Zhang, H., Song, W., & Burston, J. (2011). Reexamining the effectiveness of vocabulary learning Via Mobile Phones. *TOJET*, 10(3), 203-214.
- Zurita, G., Nussbaum, M., & Sharples, M. (2003). Encouraging face-to-face collaborative learning through the use of hand-held computers in the classroom. *Proceedings of Mobile HCI 2003* (pp. 193-208). Udine, Italy: Springer-Verlag.