9 ICLICE 2018-063 Orit Ezra

Contextualised MALL Quantitative Evaluation Tool for L2 Chinese

Orit Ezra*[a], Anat Cohen[a]
[a]School of Education, Tel Aviv University,
Haim Levanon, Tel Aviv, Israel
*Corresponding Author: oezra1@gmail.com

Abstract

Contextualised Mobile Assisted Language Learning (MALL) has been known for its potential in language learning pedagogies rooted in social constructivism theories. However a consistent approach to constituents of contextualised MALL in addition to an operative and quantitative tool to evaluate it is seemingly missing in reported case studies. The purpose of the present research is to present an index for analysing, designing and evaluating contextualised MALL drawing upon integration of existing literature of context definitions. Accordingly, real world and real life contexts variables were analysed in both Taiwan – where learners' L2 (Chinese) is the spoken language and in Israel – where learners' L1 (Hebrew) is the spoken language. Empirical data collected using a fully structured interview from 53 Chinese L2 students in Taiwan and Israel encompassing 296 types of MALL activities performed by students, was used to develop the contextualised MALL index for measuring real world and real life context learning. This measuring index was established in a combined top-down and bottom-up process, using context pre-defined literature augmented with students stories. Real world was measured by amount of activity content relation to the place, typical or non-typical objects of the place and typical situations at the place. Real life was measured by the degree of other tools assisting in another core activity which purpose was not learning. The paper presents the developed index, with preliminary examples illustrating their application. The index and the clarified demarcations between real world and real life contextualised MALL may be used by researchers and practitioners in the challenging task of analysis, design and evaluation of contextualised MALL activities.

Keywords: MALL, mobile-assisted language learning, Chinese learning, mobile learning, language learning.

Introduction, Purpose of Study, Research Question

In recent decades, language learning theories have come a long way from behaviorist and cognitive to embracing constructivist approaches (Comas-Quinn, Mardomingo, & Valentine, 2009; Wong, Chin, Tan, & Liu, 2010). One such noticeable shift is the move towards social constructivist learning which among others suggests the importance of contextualised, situated language learning as a means for achieving goals such as more meaningful learning (Comas-Quinn et al., 2009), or context-dependent vocabulary learning (Wong et al., 2010).

With the emergence of mobile devices, it became apparent that Mobile Assisted Language Learning (MALL) may be highly significant in contextualised learning. Mobile device portability enables learners to engage with contexts which they find interesting, which may lead to a more personalized, meaningful, and thus deeper learning experience (Comas-Quinn et al., 2009). The distinction between MALL and previous Computer Assisted Language Learning (CALL) technologies is evident in MALL's support of contextualised learning. Kukulska - Hulme (2012) suggests accordingly that MALL is the use of mobile technologies

in language learning, especially in situations where device portability offers specific advantages that allow interaction across different contexts. Specific characteristics exemplifying MALL contextualised learning affordances include among others location-specific language materials sent based on radio-frequency identification (RFID) or Global Positioning System (GPS) technology.

Given the above described importance of contextualised language learning and the affordances of mobile devices in supporting it, the prominence of contextualised MALL becomes apparent. However, while exploring many implementation case studies (Burston, 2013), the lack of consistent approaches to contextualised MALL constituents in addition to the lack of operative and quantitative instructions on how to analyse, design and evaluate it were found. Thus, a quantitative evaluation tool is required.

The present study examines contextualised learning in MALL activities using real world context levels – pertaining to the place where the learners are located, and real life context levels – pertaining to the learners' life. Contextualised learning in mobile Chinese learning activities performed by foreign Chinese students in two countries – Taiwan where the target Chinese language (learners' L2) is the spoken language, and Israel, which is predominantly a Hebrew (learners' L1) speaking environment, is examined. The purpose of this paper is twofold: first, to present an operative evaluation tool for quantitative analysis of real world and real life contextualised MALL; second, to present examples of the analysis using the evaluation tool. The question which guided this investigation was:

How can contextualised MALL, as encompassed by real world and real life, be quantitatively evaluated?

Theory and Literature Review

Contextualised MALL in target and not target countries. An array of studies exemplify MALL's contribution to contextualised language learning (e.g. De Jong, Specht, & Koper, 2010; Hwang, Chen, & Chen, 2011; Hwang & Chen, 2013; Rivers, 2009; Sandberg, Maris, & de Geus, 2011; Wu, Sung, Huang, Yang, & Yang, 2011). Furthermore, Situated, contextual language learning is ideally provided in the country where the language is spoken, also known as the target culture. Thus, the target culture of the country reflects the environment affordance of rich context experiences. However, mobile learning may provide alternative context-rich experiences in non-target countries (Comas-Quinn et al., 2009). Accordingly, contextualised MALL case studies cover both learning in target and non-target countries (e.g. Chen & Li, 2010; Ogata et al., 2008).

Generally, the presented literature is positive as to the outcomes of contextualised MALL and the smartphone's ability to deliver it. However, in light of many implementation case studies (Burston, 2013) lacking a consistent approach to contextualised MALL constituents in addition to an operative and quantitative instructions on how to analyse, design and evaluate it, it is therefore imperative discussing how contextualised MALL may be defined and consequently how it may be evaluated.

Contextualised MALL definitions. The present research is established on two main contexts that are intertwined in the literature: real world and real life.

Real world context. Real world contexts become learning contexts which may turn into learning content and may be informed by or sent to other peers (Pegrum, 2014); in other words, a contextualised MALL consists of varied real world places whose potential transformation into learning contexts (real world contexts) happens automatically. A learner who is walking around real world places and getting information from an electronic dictionary is an example of device mobility and real world contexts becoming learning contexts, whereas looking up words related to coffee while on the bus is not real world although searching for words related

to transportation would be. Thus, the real world pertains to the place where the learners are located. The above, along with Schilit's (1995) definition of a context as including the place and objects as well as Dey and Abowd (1999) who suggest that a context is describing situations, may be used in defining the a contextualised MALL evaluation index in real world contexts.

Real life context. Real life context is also frequently brought up as a constituent of authentic contextualised learning since during daily life actual language is used (Reinders & White, 2010). Thus, vocabulary learning may be embedded in the context of normal use rather than in abstract definitions. MALL is a practical solution to the blending of learners' learning environment and their real-life contexts (Wong et al., 2010).

Klopfer (2011) refers to mobile learning as taking place in the context of some other related or unrelated activity. This other activity may be related to one's real life. For instance, Pegrum (2014) refers to learning vocabulary while riding the bus, where the vocabulary is not related to one's other activity. According to Pegrum, since activity pertains to the learner being active, it seems that learning vocabulary should be considered real life only if there is an actual contribution to the learner's active performance within the other activity, such as purchasing a bus ticket; otherwise, in the example of simply studying bus related words on the bus, the mobile learning experience remains only real world related and not real life related. Thus, real life pertains to learners' life as reflected in their other activities.

The present research examined contextualised MALL as encompassed by the above two parameters: real world contexts which represent places in the world that may turn into learning contexts; and real life contexts which may be manifested through the (other) related activity and may not necessarily represent real world contexts but are attached the learner's authentic and daily life. Figure 1 illustrates these contextual conceptions.

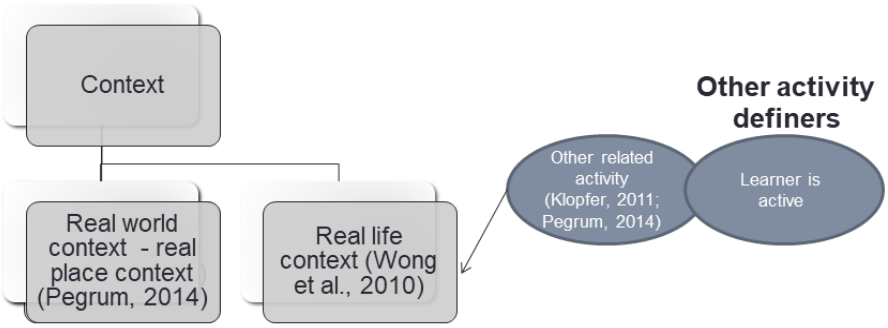

Figure 1. Real world/real life context model – literature based

Noticing the above mentioned case studies and many more (Burston, 2013) lacking of consistency in what constitutes contextualised MALL, in addition to operative and quantitative instructions on how to analyse, design and evaluate it and since most MALL-related studies report no objectively quantifiable learning outcomes (Burston, 2015), the present study sought to provide evaluation tool for the above real world and real life contextualised MALL. The decision to setting foot in Chinese is explained next.

Mobile Mandarin-Chinese learning. Following China's rise in the 21st century, L2 Chinese learning has been flourishing (Chen, 2010). Contextualised learning is particularly meaningful for learners of Chinese. Chinese is difficult to learn, particularly for westerners whose European language background is very different from the complicated characters or logographic writing system, and the pronunciations or tonal character of the phonological

system of Chinese (Moser, 1991; Tseng, Lu, & Hsu, 2007; Wang, Koda, & Perfetti, 2003); it might be harder to transfer the knowledge and the skills to the real world or real life contexts but learning in them can promote transfer from one context to another (Klopfer, 2008). On the other hand, a student's level might not be sufficient for using contextual opportunities (Al-Mekhlafi, Hu, & Zheng, 2009). Thus, the suggested evaluation tool is based on exploring Chinese learning activities.

Contextualised MALL is likely to contribute to Chinese language learners (at target or not target counties), similarly to all other language learners, as described above. It may also be beneficial to specific Chinese language particular needs such as learning of idioms and proverbs (成语) which are highly context-dependent in that there are many possible contexts where such vocabulary could be suitable or unsuitable (Wong et al., 2010). Thus, the suggested evaluation tool is based on exploring Chinese learning activities.

Methodology

For the purpose of this research, 53 beginner-intermediate students of Chinese as a second or foreign language (L2) at two universities in Israel and one university in Taiwan were interviewed based on fully structured interview. It is important noting that activities and not the students themselves were the objects observed in this research.

During the interview, the learners reported of their mobile Chinese learning activities that occurred in the past month and outside of their house. They then answered questions pertaining to each activity based on the research dependent context variables. Learners specified the places at which the activity occurred in the past month and particular occurrences they remembered best. These occurrences were referred to as events. For each event, learners were required to state the place where the event took place, describe it in detail, express the level of real world and real life context according to the questions as guided by the interviewer and state their arguments for these context level selections. The real world and real life questions were pre-defined prior to data collection to meet known literature about real world and real life contexts definitions as described above (Dey & Abowd, 1999; Klopfer, 2011; Pegrum, 2014; Schilit, 1995; Wong et al., 2010). Specifically, the following questions were asked:

Real world question: "To what degree was the activity/were the activity materials such as the application, website or pure content related to your physical location at the time, to the objects at the place which you came/did not come in contact with, or to the situation at the place where the activity occurred"?

Real life the question: Was presented in a three-step process. In step 1, the question regarding other activities was asked. In step 2, aiming to locate real life activities with no direct learning purposes, the learners were asked for the main purpose of the other activities. Activities which purpose was to learn Chinese were removed.

In Step 3, for each of the reaming (other) activities, learners were asked: "Was the (other) activity related to the Chinese mobile learning activity or its applications, websites or content materials?" If it was related, then learners were asked to grade the other activity by answering the following question: "To what degree was the Chinese learning/practicing/using activity or the activity materials – applications, websites or content, related to the other activity?"

Data regarding 296 activity types and 519 events (each learner activity may have had a few events) was collected from the 53 respondents who all reported on mobile Chinese usage outside of their residence. The range of the number of activities for each learner was 1–18 and the range of the number of events for each activity was 1– 6. A detailed segmentation of target and non-target countries is depicted in table 1.

Table 1
Learners, activities and events figures

Country	*N* learners	*N* activity types	*N* events	Activity range per learner	Event range per activity
Target: Taiwan	27	148	255	1–12	1–4
Non-target: Israel	26	148	264	2–18	1–6
Total	53	296	519	1–18	1–6

Most outside observed activities involved smart phones (N=259). Some activities involved tablets or smart phones (N=17) and some only involved tablets (N=9). The remainder involved either car audio CD, MP3s, iPods or iWatch (N=8). Notably, the devices of three activities were missing.

The following research employed a qualitative strategy for analysing students' mobile learning activities. The question, how can contextualised MALL, as encompassed by real world and real life, be quantitatively evaluated? was addressed by reviewing the data and analysing it using the qualitative method. At the end of this qualitative analysis a quantitative operative evaluation index was developed.

During this stage, the researchers performed an inter-judge reliability process in addition to analysing the events to allow for the creation of real world and real life contextualised MALL index. The intensive inter-judge reliability process was performed to establish agreement between the researchers concerning the context variables (real world content level and real life context level), and the definitions of activities and events. The evaluation index development process which was based on events analysis (and which was accompanied by the inter-judge reliability process as stated above), was used to answer the research question pertaining to the possible evaluation of real world and real life context. Thus, in a combined top-down and bottom-up approach, an index which had been based on initial literature-based real world/real life context definitions and on learners' stories, was empirically developed and adjusted.

At the end of this research procedure a quantitatively operative evaluation index of real world and real life contextual MALL was developed, based on the described qualitative strategy. The index and some preliminary examples of the analysis using the index are presented in detail next in the finding chapter.

Findings

Real World and Real Life Contextualised MALL Quantitative Evaluation Index

Real world. *For e*ach activity's event three scores were found: place score, object score and situation score based on the amount (partial or full) of content relation to the place, the non-typical or typical objects of the place, and the typical situations at the place where partial content relation or relation to non-typical objects received lower scores.

The place score in ascending order could be 0, 1.A or 2.A; the object score in ascending order could be 0, 0.1, 0.2, 1.B or 2.B; the situation score in ascending order could be 0, 1.C or 2.C (Figure 2).

Factors		2. Place factor			
		Place (P)	Non-typical object (NTO)	Typical object (TO)	Typical situation (TS)
1. Content factor	No content relation	0	0	0	0
	Some content relation	1.A	0.1	1.B	1.C
	All content relation	2.A	0.2	2.B	2.C

Figure 2. Real world context level index

Preliminary examples of activities which demonstrate the application of the real world context index are presented next ordered by their real world context degree (Figure 3).

Case name	No relation	NTO		P	TO	TS	P	TO	TS
		Some content	All content	Some content			All content		
	0	0.1	0.2	1.A	1.B	1.C	2.A	2.B	2.C
Online conversation case	X								
Tattoo case			X						
Typical conversation case				X	X	X			
Place online conversation case					X	X	X		
Sign case							X	X	
Restaurant case							X	X	X

Figure 3. Real world context level index – examples

Online conversation case: This case scored lowest, 0. Learners corresponded with another party (for instance through social media) in various places and for various purposes such as scheduling an appointment or just holding a conventional conversation. Words were completely unrelated with the place or its typical objects. Moreover, since the conversation was not even held at the place (rather online), it was not qualified as a typical situation at the place.

Tattoo case: This case scored 0.2. Learners searched their electronic dictionaries for words completely related to tattoos belonging to someone in their vicinity. The tattoo represented the person who was not necessarily a typical object of the place. However, as mere curiosity triggered these incidents, there seemed to have not been any typical situations.

Typical conversation case: This case scored 1.A, 1.B, and 1.C. Learners used their electronic dictionaries to assist in their conversations about the coffee place they were at, but the conversation went beyond coffee, so only some words were related to the coffee place, the coffee (typical object) or to the typical situation which in this case was the actual conversation.

Place online conversation case**:** This case scored 1.B, 1.C, and 2.A. Learners held online conversations, while the content was related to the place. Nevertheless, content may have been partially related to typical objects and partially to typical situations. For example, a learner at a bar corresponded about what she was having (typical objects) and what she was doing (typical situations). This is also an illustrated of the ability to have a mixed score (1.B, 1.C, 2.A).

Sign case: This case scored 2.A and 2.B.Various manifestations appeared across signs (such as parking lot signs). Learners searched their electronic dictionaries for words completely related to the place which the sign represented and to typical objects of the place – namely the sign attached to the place. However, as mere curiosity triggered these incidents, there seemed to have not been any typical situations.

Restaurant case: This case scored the highest, 2.A, 2.B and 2.C.Various manifestations appeared across consumer venues such as restaurants, supermarkets, and stores. Learners searched their electronic dictionaries for words completely related to the place, to its typical objects – such as menu or supermarket and store products, and to typical situations such as checking menus or searching products.

Real life. For each activity's event one score was found based on the level of assistance/support/contribution of the mobile Chinese learning activity to the other (real life) activity. The other activity could draw support from the learning activity either without any other supporting tools such as English or human help or alongside other supporting tools which received a lower score. The other activity examined was the smallest activity which was found to be contributed by the mobile learning activity; it was referred to as the core activity. Based on the above constructed index, the elaborated new context model of the real world and real life was also revealed.

Figure 4 demonstrates the scoring process: events in which the mobile learning activity did not support any real life activity received 0, events in which other (real life) activities were supported by the mobile learning activity and other tools received 1, and events in which other (real life) activities were solely supported by the Chinese mobile learning activity received 2. Thus, in total, each activity's event received one of 3 possible scores – 0,1 or 2.

No support	Support alongside other tools (AOT)	Support without other tools (WOT)
0	1	2

Figure 4. Real life context level index

Preliminary examples of activities which demonstrate the application of the above real life context index are presented next ordered by their real life context degree (Figure 5).

Examples and comments	Other core activity	Other supporting tools	No support	AOT	WOT
			0	1	2
Sign case			X		
English menu restaurant case	Check menu	English		X	
Restaurant case	Check menu/ product details				X
Online scheduling appointment case	Scheduling appointment				X

Figure 5. Real life context level index – examples

Sign case: This case scored the lowest, 0.Various manifestations appeared across signs (such as parking lot signs). Learners searched their electronic dictionaries for sign words. However, as mere curiosity triggered these incidents, there seemed to have not been any other core activity at the place (whose purpose was not learning).

English menu restaurant case: This case scored 1. Similar to the above restaurant case; however, the menu was available in Chinese and English.

Restaurant case: This case scored the highest, 2. Repeated in places such as restaurants and supermarkets. Learners searched their electronic dictionaries when checking the menu/products which were offered only in Chinese.

Online scheduling appointment case: This case scored the highest; 2. Learners corresponded with another party through social media for real life purposes. The conversation was held in Chinese only.

The types of supporting tools which emerged, among others, included: English or any other non-Chinese language - for instance, in online conversations; human help - for instance, as a service person assisting in finding a product at a store alongside checking an electronic dictionary for the product name; and parking lot or street signs when using Google Maps (a hybrid blend of English and Chinese) for navigation.

Discussion

The real world and real life context components and their index as developed in this study offer a consistent approach to what constitutes contextualised MALL in addition to supplying operative and quantitative instructions on how to analyze, design and evaluate it.

The real world context index is based on the content factor as well as the place factor. Events can be scored based on how much their content is related to non-typical objects of the place, place, typical objects of the place or typical situations. Checking the content and place factors may be important since focused environmental circumstances provide a subconscious environment which makes it easier to remember words (舒, 2008), thus, higher scores are attached to those activities at the restaurant (place) and when reading the menu (typical object and situation).

The real life index is based on the other tools factor. Events can score based on how much they independently support another real life core activity. For example, a higher score is attached to the above mentioned restaurant activity if an English menu is not present. By doing so, similarly to the real world context, focused activity circumstances may be provided.

Furthermore, the index which was developed, also established a clearer operative demarcation between real world and real life contexts. The real world context involves the place and everything is examined in terms of its relevancy to the place (or the place typical object or typical situations). For example, Al-Mekhlafi et al. (2009) contextual Chinese learning system, which offered sentences when learners' activities matched their location, seems to coincide with the fine-tuned definition presented in this research of a real world context as a typical situation rather than just a context and a situation as presented in some context related literature (Dey & Abowd, 1999; Schilit, 1995).

The real life context involves activity which does not necessarily relate to the place but has a context in one's life; thus an online conversation such as online scheduling case is not related to the real world place, but is related to one's real life. A sign case on the contrary, in which mere curiosity triggers learner's observation of sign wording (reading the sign is indeed the other activity but one with an intention of learning) is not real life, albeit real world. Whereas in real life the learners are very active, in the real world even when not as active they may still perform contextual learning.

Limitations

This study analysed 296 activity types of 53 learners in both target and not-target countries which is a relatively small number of students. Further validation is required in larger volumes and in different country settings.

Recommendations for Practitioners and Future Research

The conclusions of this study may assist practitioners and researchers alike, particularly of Chinese-Mandarin which is in rising need of propagation (Allen-Ebrahimian, 2015). Teachers could enhance their knowledge about students MALL practices in target and non-target country and be encouraged to further usage of mobile technology (Van Praag & Sanchez, 2015). The demarcations sought in this study of contextualised MALL constituents of real world and real life may turn valuable for more consistent practice and research of contextualised MALL particularly in light of many implementation studies (Burston, 2013) that seem to be blurring the real world and real life definitions.

Furthermore, the newly developed index built on objective contextual definitions henceforth may be of help in the challenging task of analysis, design, evaluation and assessment of contextualised MALL activities whose difficulty results from learners' subjectivity (Comas-Quinn et al., 2009); Or as depicted by Traxler (2007) from the personal contextual 'noise' which is problematic in definition and evaluation.

Future studies may also validate the above index by applying it in more target and non-target universities and perhaps even different L2s. Activities designed to bring the maximum contextualised scores based on the index could be built into existing curriculum to prove applicability. Ideally they should also be validated against quantitative learning outcomes and perhaps even be used to compare the real world and real life contextual learning given its differences as shown in this study.

Attention should also be turned to other factors that may have an influence on the level of contextualised mobile language learning. Indeed, the authors' subsequent papers are planned to broaden the description of the index, by suggesting statistical scales for measuring activities and focusing on the correlations between real world and real life. Additionally, the influence

of target country and mobile material types (Reinders & Pegrum, 2016) on contextualised MALL will be explored.

Conclusions

The study findings suggest a clarifying demarcation of real world and real life contextualised MALL with a quantitative evaluation index tool to allow for their measuring. In fact, to reach the contextual index, the authors of this paper had further developed a contextualised MALL research framework based on theoretical background and adapted methodological means which details are described in Ezra, (2017). In addition to aspects presented in this paper, namely activities, events, country, and the real world/real life context levels index, the framework offers additional variables such as mobile material type, and specific procedures which may assist practitioners and researchers in analysis, design, evaluation and assessment of such contextual MALL.

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