Towards a seamless language learning framework mediated by the ubiquitous technology

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Abstract: The ready-to-hand access of mobile devices creates the potential for practicing the novel approach of ‘seamless learning’, marked by continuity of the learning experience across different contexts. In a related note, the focus of Mobile-Assisted Language Learning is swinging to authentic or social mobile learning activities. In turn, we propose perspectives and approaches to address the need of establishing Seamless Language Learning (SLL) practice. Building on existing research work on Mobile-Assisted Language Learning (MALL), the approach highlights a socio-techno-pedagogical framework to address the challenges of the young learners of Chinese as a second language. We will describe how SLL informs a prospective study entitled MyCLOUD (My Chinese Language ubiquitOUs learning Days), and discuss some methodological issues pertaining to the study. The framework is intended to explore ways in closing the loops in both the seamless learning perspective and the language learning perspective through the ongoing learning process mediated by the ubiquitous technology.

Keywords: MALL; mobile-assisted language learning; seamless learning; vocabulary learning; socio-techno-pedagogical framework; DBR; design-based research; design for scalability.


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1 Introduction

Learners from the Generation-Y live in a world where there is constant interplay between the physical and digital realms, and the use of technologies such as blogging, social networking and digital content remixing are integrated into their lifestyles (Looi et al., 2010). However, these technology-mediated activities may not necessarily be integrated into their formal learning activities. In the context of K-16 education, the distinction between formal and informal learning remains, though clear boundary between the two are gradually diminishing (e.g. Cook et al., 2008; Zhang et al., 2010). The proliferation of participatory web 2.0 supported by cloud computing technologies has prompted educators
to look into ways to leverage the learners’ enthusiasms in the use of technologies to extend their learning beyond the four walls of the classroom.

The ready-to-hand access of mobile devices, which could function as a personal ‘learning hub’ (Looi et al., 2009), creates the potential for a new wave of evolution of Technology-Enhanced Learning (TEL) that is characterised by ‘seamless learning spaces’ (Chan et al., 2006, p.3). Such spaces are marked by continuity of the learning experience across different environments. Individual learner who has $24 \times 7$ ubiquitous access to at least one mobile device (1:1) would have plenty opportunities to traverse the formal and informal contexts, physical world and cyberspace, as well as personal and social learning spaces (Wong and Looi, 2011; Wong, 2012).

In a related note, paralleling to the paradigm shift in language learning theories from behaviourism to a communicative (e.g. Salaberry, 1996; Hoopingarner, 2009) and authentic (e.g. Mishan, 2005) learning approach, the focus of Mobile-Assisted Language Learning (MALL) is swinging from content-based delivery of relatively static learning content through mobile devices to design-oriented authentic or social mobile learning activities (Kukulska-Hulme and Shield, 2007). It is expected that such a trend can make MALL a viable solution to blending learners’ language learning environment into their daily life (Wong and Looi, 2010).

In this paper, we propose perspectives and approaches to address the need of establishing Seamless Language Learning (SLL) practice. The proposed approach is grounded in the theories pertaining to language learning and TEL. Building on existing research work on mobile-assisted seamless learning, the emerging approach highlights a socio-techno-pedagogical framework to address the challenges of Singapore ethnic Chinese children’s (who tend to be more well-versed in English) learning of Chinese as second language (L2). We will describe how the notion of SLL informs a prospective research study entitled MyCLOUD (My Chinese Language ubiquitOUs learning Days), and discuss some methodological issues pertaining to the study. The proposed framework could contribute to current research by exploring ways in closing the loops in both the seamless learning perspective and the language learning perspective through the ongoing learning process mediated by the ubiquitous technology. Matching the affordances of ubiquitous technology to these perspectives would enhance the development of 21st century knowledge and skills and nurture holistic language competencies among learners.

2 The rationale of seamless language learning

One of the critical problems in traditional second language (L2) classroom practices is the excessive amount of decontextualised information, indirect and abstract language knowledge, and ‘secondhand’ experiences confined in classroom context (e.g. Jiang, 2000; Tedick and Walker, 2009). Therefore, language learning theorists have been advocating the integration of formal and informal language learning since the 1960s (e.g. Titone, 1969). The integration implies greater learner autonomy in language learning (in both formal and informal learning settings), which is again a notable trend in both modern language learning research and practice. Recent textbooks written for language teacher education had included chapters or sections on learner autonomy (e.g. Hedge, 2000; Harmer, 2001). In a nutshell, learner autonomy refers to learners taking charge of their own learning (Holec, 1981). In the context of language learning, Little (1999, 2007) outlines three interacting principles for classroom pedagogy: learner involvement, learner reflection and target language use.
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Personalised mobile devices can become a learner’s learning hub that facilitates and supports learner involvement, learner reflection and target language use across different learning spaces (i.e. not restricted to the classroom pedagogy that Little posits in his work). Such 1:1 TEL model has great potential in facilitating a significant reform in language learning. Nevertheless, the potential has yet to be thoroughly explored or exploited by MALL researchers. Almost all the MALL studies to date have been heavily focusing on either formal learning (e.g. Zurita and Nussbaum, 2004; Chang et al., 2010; Wong et al., 2011a) or informal learning (e.g. Joseph et al., 2005; Fallahkhair et al., 2007; Song and Fox, 2008). The integration of both seems rare, perhaps due to the relatively demanding time and resource requirements in conducting research on multiple learning contexts in one study. Furthermore, whereas language learning theorists stress the importance of learners’ autonomous, ongoing and incremental exposure to language comprehension (listening and reading) and production (speaking and writing) activities to ensure effective language acquisition, current MALL designs and enactments tend to be episodic or short-term in durations (e.g. Ogata et al., 2004; Chen et al., 2009; Looi et al., 2009).

We envisage an ongoing (perhaps longitudinal) SLL model to address the research gap. With proper learning design, the mobile and ubiquitous technology could facilitate the transformation of classroom learning activities into a more learner-centred, personalised and social learning process. Learners engaged in such a learning experience need to process and associate their experiences or the situated information received (informal contexts) with the knowledge that they have acquired or constructed in the classroom, reflect upon any discrepancy and apply the knowledge for out-of-class communication. In the context of language learning, it is to apply their language knowledge for communication, articulation of thoughts or production of linguistic artefacts such as essays, tweets (brief status updates on social networks), blog entries or podcasts. Eventually, it is desirable to feed the learners’ situated learning gains back to the formal class for generalisation, thus completing a seamless learning cycle, and therefore increase the learners’ abilities in applying the target language in their daily life.

3 The focus on vocabulary learning – the MALL study of ‘Move, Idioms!’

Vocabulary acquisition has a central role in learning a L2 (e.g. Sokmen, 1997; Hulstijn, 2000). One important claim is that a good knowledge of how the system of language works (grammar) may not necessarily enable one to communicate; however, it is usually possible to communicate if one has sufficient vocabulary (Wallace, 1988). Furthermore, Ellis (2002) posits that early L2 learning should be focused on vocabulary, and that grammatical instruction comes after learners are able to engage in message-focused tasks using whatever language they have regardless of grammatical correctness.

However, Schmitt (2008) observes that many L2 teachers (as well as many vocabulary-focused MALL studies, e.g. Levy and Kennedy, 2005; Chen and Chung, 2007; Meng, 2009) have been emphasising behaviourist-oriented rote learning of large quantity of vocabularies, and consider a word ‘learnt’ if the spoken/written form and meaning are known. Contrarily, Nation (2001) highlights the necessity of the inclusion of contextualised components of vocabulary knowledge, such as grammatical functions, collocations and constraints on use. Therefore, while it is true that the form-meaning link is an important aspect of vocabulary acquisition, learners ought to advance to contextualised exposures (listening and reading) and productive use (speaking and writing) of vocabulary, perhaps in authentic situations, which is what another smaller
set of MALL studies had investigated (e.g. Joseph et al., 2005; Ogata et al., 2008). Nevertheless, to close the loop, we argue that it is important for the learners to proceed for generalisation of vocabulary knowledge (Schmitt, 2008) through personal reflections or social meaning negotiation in the classroom or online. In other words, a seamless cycle of language learning should involve both contextualised understanding and contextualised use of the vocabulary, and followed by the effort to generalise the word meanings, perhaps across both formal and informal settings. Current technology such as the mobile devices and web 2.0 platforms offer many affordances to support the cycle of learning, which we will explicate below.

We conducted an intervention study on SLL entitled ‘Move, Idioms!’ from February to November 2010. In learning Chinese idioms and conjunctions (two special forms of Chinese vocabulary), students are provided with smart-phones on a 1:1, 24 × 7 basis. They were encouraged to make sense of what they learn in classroom by capturing photos of the real-life contexts pertaining to the idioms/conjunctions, and to construct sentences with them. Subsequently, in-class or online (wiki) sharing and discussions on the contexts took place to enhance the students’ understanding of the proper usage of the idioms/conjunctions. The multiple sentences constructed by the students then form a basis for the discussion of the grammatical rules involved and the inductive reasoning allow students to construct generalisable meanings of the vocabulary. Informed by the Design-Based Research (DBR) methodology, we co-constructed a cyclic learning process for ‘Move, Idioms!’ with the teachers involved to guide the ongoing learning experience design and refinement, as shown in Figure 1.

**Figure 1** The mobile-assisted idiom learning process

The processes of the four activities are described below:

*Activity 1 – In-class or on-campus contextual idiom learning (formal setting; physical and social learning space):* The activity is aimed for assisting the students in establishing
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the initial form-meaning link of the idioms/conjunctions, as well as motivating and preparing students to engage in subsequent after-school activities. During each lesson, a few animations of idioms/conjunctions are shown in-class. The animations illustrate the meaning of the idioms and they remain accessible by the students after school via smartphones. The teacher then conducts contextualised collaborative learning activities such as facilitating student groups to take photos and make sentences on campus to illustrate the idioms/conjunctions.

Activity 2 – Out-of-class, contextual, independent sentence making (informal setting; physical, individual and productive learning space): Students carry their smart-phones 24 × 7. Apart from watching the animations repeatedly, they identify or discover contexts in their daily life that are associated with the idioms/conjunctions. They then take photos, make sentences by using the idioms/conjunctions as photo captions, and post them onto a class wiki. In the wiki, we create one page for each idiom/conjunction for students to post their photos/sentences. This allows comparison of student-identified contexts and their sentences pertaining to the same idioms/conjunctions.

Activity 3 – Out-of-class, online peer learning (informal setting; cyber- and social learning space): Students learn from and perform peer reviews on the wiki by commenting on (with the wiki comment tool), correcting or improving their peers’ sentences (by modifying the sentences posted on the wiki pages). They may use PCs or laptops in school or at home to access to the wiki space.

Activity 4 – In-class consolidation (formal setting; social and receptive learning space): The teacher facilitates class-wide or small group discussions on selected sentences made by the students on debatable contextual use of specific idioms/conjunctions.

We conducted a nine-month intervention study in 2010 with 34 Chinese Singaporean students with diverse proficiencies of the Chinese Language from a Primary 5 (5th-grade; 11-year-old) class. Each of them was assigned a Samsung Omnia II smart-phone running MS Windows Mobile™ 6.5 and with functions such as built-in digital camera, Wi-Fi access, internet browser and English/Chinese text input. Furthermore, we used xwiki (see www.xwiki.org) to create the wiki space for photo/sentence sharing and peer reviews. The teacher conducted numerous cycles of ‘Move, Idioms!’ learning process.

The study yielded promising results. Due to the space constraint, we will only provide summarised findings in subsequent text. More details are given in the work of Wong et al. (2010) and Wong (in press).

During the study, the students contributed a total of 920 photo/sentence sets. We found the students’ photo/sentence production and commentary activities analogous to photo-blogging in general sense and yet strongly linking to the SLL process facilitated by the teacher. We categorised the student artefacts and their self-reported creation processes into three dimensions, namely: ‘types of physical setting’, ‘types of meaning making’ and ‘types of cognitive process in artefact creation’. With that, we observed a similar pattern, across most of the students, of language improvement and their more eager interactions with the physical environment in their daily life. This can be attributed to the process of personal meaning making. Table 1 depicts the categorisations of the student artefacts with an example given under each category. The original idioms are underlined in the students’ Chinese sentences – some sentences contain grammatical errors but we preserve them in their originality. To benefit international readers, we translated the sentences into English with the translations of the idioms underlined.
### Table 1  Categorisations and examples of student artefacts in ‘Move, Idioms!’ (see online version for colours)

<table>
<thead>
<tr>
<th>Categorisation type</th>
<th>Categorisation &amp; description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural setting (photo context)</td>
<td>They are discussing something important in groups of three and four.</td>
<td><img src="image1" alt="Example Image" /></td>
</tr>
<tr>
<td>Object manipulation</td>
<td>The animals come in droves and eat the grass in a carefree manner.</td>
<td><img src="image2" alt="Example Image" /></td>
</tr>
<tr>
<td>Types of physical setting (photo context)</td>
<td>They are racing out the door.</td>
<td><img src="image3" alt="Example Image" /></td>
</tr>
<tr>
<td>Previously published materials (e.g., TV snapshots, book illustrations, Internet images)</td>
<td>When little sister sees the mascot, she rushes cheerfully to take a photo with it.</td>
<td><img src="image4" alt="Example Image" /></td>
</tr>
<tr>
<td>Literal meaning making (The sentence demonstrates a direct description or interpretation of the photo context.)</td>
<td>My cousin is very fond of SpongeBob as he looks so cute when smiling ear to ear.</td>
<td><img src="image5" alt="Example Image" /></td>
</tr>
<tr>
<td>Types of meaning making (relationship between photo and sentence contents)</td>
<td>&quot;Wow! These are our favourite dishes!&quot; Brothers react with excitement.</td>
<td><img src="image6" alt="Example Image" /></td>
</tr>
<tr>
<td>Extended meaning making (The sentence demonstrates a logically deductive interpretation on the photo context.)</td>
<td>Tourists come from far off distances to visit Singapore Flyer. They were watching and raving about the vast stretch of beautiful scenery.</td>
<td><img src="image7" alt="Example Image" /></td>
</tr>
<tr>
<td>Creative meaning making (The sentence demonstrates a twisted, perhaps creative, abstract or metaphorical reinterpretation on the photo context.)</td>
<td>&quot;Chris, I am going to eat you!&quot; said the little boy.</td>
<td><img src="image8" alt="Example Image" /></td>
</tr>
</tbody>
</table>

In addition, the students’ online and in-class peer reviews have further enhanced both their understandings in individual idioms/conjunctions and their socio-cognitive skills. Through the student interviews, we have also found out that the learning activities have stimulated more family member interactions and intergenerational/sibling learning—some students worked with their family members to create the digital artefacts, such as brainstorming for photo ideas or enlisting family members as photo models. All these are indicators of social meaning making.
4 From ‘Move, Idioms!’ to MyCLOUD – towards a scalable SLL environment

Despite the encouraging outcomes, there are challenges in terms of the scalability and sustainability of the project. The learning design may be seen as an add-on in relation to the formal Chinese Language curriculum, i.e. it is nice-to-have but too resource-consuming to implement in an ongoing basis. Furthermore, during the study, despite being able to motivate the students to carry out after-school artefact creation activities, most of them did not go beyond creating artefacts pertaining to the idioms/conjunctions, albeit being encouraged to work on other lexical items that they are learning or encountering in formal or informal settings.

Idioms and conjunctions constitute a limited and highly context-specific aspect of language learning. A good contextual knowledge of the relatively small set of idioms (48 idioms were covered in the study) may enrich the students’ oral and written expressions. However, the effects on the students’ overall language proficiency are restricted.

Studies in psycholinguistics may shed light on the limitation of ‘Move, Idioms!’ (and almost all other prior MALL studies) in this aspect. Psycholinguists believe that an individual stores vocabulary of a language in the form of mental lexicon. However, the mental lexicon differs radically from a dictionary as it does not store lexical items in an alphabetical order (Müller, 2008).

To understand how L2 mental lexicon is represented as a whole, it is important to make a distinction between episodic and semantic memory (Tulving, 1972; Tulving, 1983). Episodic memory receives and stores information about episodes or events. Semantic memory, conversely, functions like a mental thesaurus. It organises knowledge one possesses about verbal symbols, their meaning and referents, and the relations among them. In word recognition studies, a similar distinction has been made between the lexical system (mental lexicon), and the non-lexical, episodic system (Forster, 1985). Within the mental lexicon, words coexist in a semantic network. When a word is used, the activation in the mental lexicon spreads over its semantic network. In general, there exist two general lexical relations in the lexicon: the syntagmatic (collocation) relation and the paradigmatic (hyponymy, hierarchies, antonymy and synonymy) relation (Aitchison, 2003; Feng, 2008). The mental lexicon of a person is dynamic – new words acquired should be integrated to the network, which is analogous to the constructivist view of linking prior and new knowledge. If a learner encounters or rote-learns a word without a deep understanding of both its meaning and contextual usage, it may become a word in the episodic system (Jiang, 2000). In turn, we argue that a truly holistic L2 vocabulary learning process should involve the interplay of contextualised learning of individual L2 words and the construction of personal L2 mental lexicon. There had been studies in language instructions where a variety of mental lexicon-related approaches were developed, such as semantic mapping, word associations and finding substitutes (e.g. Crow and Quigley, 1985; Nation, 1994; Sokmen, 1997), but other researchers argued the inadequacy of such strategies for skipping the contextualisation stage (e.g. Gu and Johnson, 1996).

To address the limitations of the ‘Move, idioms’ project, we explore a new vocabulary learning model, namely MyCLOUD, by mobilising the formal Chinese Language curriculum across three levels (Primary 3–5, or 3rd–5th grade). MyCLOUD supports cross-context seamless learning process (arose from ‘Move, Idioms!’) and other practices
informed by language acquisition theories (e.g. mental lexicon). Through the ‘Move, Idioms!’ study, we gained a good understanding in how to facilitate SLL experiences and what is the potential of such a learning model. Our next move is to build on this learning model to address the research gap in interventions that are genuinely informed by language learning theories, an aspect that is often ignored by prior MALL studies (Wong and Looi, 2010).

5 MyCLOUD – the research process and platform development

In the MyCLOUD project, we intend to iteratively design, implement, evaluate and refine a ubiquitous seamless learning environment for Chinese Language learning that is both integrated into the formal classroom lessons and promoting students’ after-class self-directed learning. As the national curriculum of Chinese Language embroils a series of textbook passages associated with various learning goals, including vocabulary learning, to mediate classroom instructions; the vocabulary-focused learning process of MyCLOUD will take the lexical items of the passages as the starting point of each learning cycle (see Figure 1). However, instead of prescribing a learning model developed solely by us, we will facilitate dialogues between research and practice by only proposing a high-level socio-techno-pedagogical design framework. We will then form a researcher-teacher taskforce to co-design and refine the concrete pedagogy in ongoing basis, where teachers’ practical experiences will be respected. We adopt this approach in order to ease the settling of the learning model into the school ecology (see Wong et al., 2011b).

As depicted in Figure 2, our proposed high-level design framework synthesises two important theoretical perspectives, namely the language learning perspective and the seamless learning perspective. To incorporate the language learning perspective, we examine how relevant linguistic theories and language learning theories such as mental lexicon, contextualised learning, incidental vocabulary learning, inductive learning and productive learning can be integrated into the learning design. We consider how vocabulary learning can serve as a starting point that leads to learning and/or enhancement of other aspects of the linguistic skills – grammar, oral, reading, writing, etc. The iterative process starts with vocabulary contextualisation through situated learning (e.g. Nation, 2001), followed by generalisation through personal reflection and social meaning making (e.g. Long, 1980; Pica, 1994), and finally the construction of mental lexicon (e.g. Hall, 1992; Tse et al., 2007). In a nutshell, it is a bottom-up process in building a learner’s mental lexicon.

In the seamless learning dimension, we seek to refine and research the SLL processes that we previously developed for ‘Move, Idioms!’ (see Figure 1). We do not prescribe the details of the to-be-adapted four-activity process as it will be up to the researcher-teacher taskforce to design the actual activities. For example, for the ‘contextual independent learning’ activity, it was referred to student artefact creation in ‘Move, Idioms!’ project. In MyCLOUD project, we may retain this effective learning activity while incorporating additional ubiquitous learning activity types to further enhance student learning. Conversely, for ‘vocabulary learning’ in formal setting, we might explore alternative activity models such as off-campus (perhaps context-aware) mobile learning field trips.
In Figure 2, the dashed lines between the two dimensions refer to the possible mappings between the seamless learning activities and the language learning activities – for example, ‘construction of mental lexicon’ could take place during ‘contextual independent learning’ (construction of students’ personal mental lexicon) and ‘in-class consolidation’ (group mental lexicon), respectively. These mappings are again not prescriptions but rather references for future learning co-design. Furthermore, the bi-directional arrows signify that the three-step vocabulary learning process is iterative and intertwining (i.e. not fixed sequence) in nature. Nevertheless, we acknowledge that such a cognitively and disciplinarily demanding learning process is a tall order for average primary school kids to carry out. That is also one of the main reasons that we set the intervention period to be three years in three experimental classes. Instead of overwhelming them with all the learning activities stated in Figure 2 from Day One, we intend to gradually introduce various learning activities and emphasise them at different stages, in order to progressively foster autonomous learning with ubiquitous technology among students. Our rough plan for the three years’ interventions in the three experimental classes is

- **Year 1 (Primary 3):** We will focus more on contextualised learning (such as, photo taking and sentence making to describe their daily life) and simple social networking activities (see below) plus relatively casual and superficial discussions on their peers’ artefacts.
- **Year 2 (Primary 4):** With the contextualised learning activities still going on (where they will start to write paragraphs containing not one but multiple ‘target vocabularies’ to describe the photos that they take), we will foster more meaningful, inductive peer reviews among the students. They will also deepen their learning through the construction of simple personal mental lexicons.
Year 3 (Primary 5): While the contextualised learning activities are still going on, we will elevate them to construct more complex personal and group mental lexicons.

The main mobile device that we will provide to the students in the three experimental classes in 1:1, 24 × 7 basis will be tablets (Acer Iconia Tab W501), where they can carry out most of the MyCLOUD activities across different learning contexts. In addition, they may either make use of their personal digital cameras or camera phones, or occasionally sign out smart-phones from the school. These lightweight devices will become supplementary tools for their spontaneous photo taking activities in their daily lives and perhaps having quicker and more convenient access to My Mictionary or tweeting (see below).

Informed by the prospective researcher-teacher co-designed MyCLOUD learning model, we will proceed to develop the MyCLOUD platform that leverages on ubiquitous and cloud computing technologies to mediate students’ SLL activities. The entire system will consist of student user interface and teacher user interface.

The central component of the student user interface will be My Mictionary (My Mobile/Mental dictionary), a cloud-based personalised dictionary. Starting with an ‘empty’ dictionary, My Mictionary can serve as an individual student’s vocabulary learning e-portfolio for her/him to add vocabularies that she/he learn either intentionally (e.g. in-class, in the digitised textbook passages featured in the platform) or incidentally (unfamiliar vocabularies encountered by the students in daily life), anytime, anywhere. When a new vocabulary is added, the system will automatically extract its definition and example sentences from an online Chinese–Chinese and Chinese–English dictionary which will be identified by the teachers based on their students’ need, and incorporate the vocabulary into the ‘vocabulary page’ (lexicon entry) in the student’s My Mictionary. The student can then continue to build the content of each ‘vocabulary page’ by incorporating relevant internet resources (e.g. web pages, online photos or YouTube videos) and upload her/his own photos with accompanied sentences/paragraphs (similar to the approach of ‘Move, Idioms!’). My Mictionary may also serve as the basis for the students to construct their personal or group mental lexicon (with additional MyCLOUD affordances for semantic map creation, with each node in the map that represents a vocabulary linking to its corresponding lexical entry). Furthermore, a wiki-like CoMictionary (Community Mictionary) will be developed for students to share and peer-review their artefacts (similar to the wiki space in ‘Move, Idioms!’). We will also incorporate essay writing tools into the platform so that students can easily make use of My Mictionary to support their writing, as well as link sentences in their essays to their My Mictionary.

In addition, as we discovered most of the Primary 3 children’s express tremendous interest in social networking with their peers (albeit almost always in English) through our pre-intervention surveys and interviews with the potential target students, we decided to incorporate some social networking functionality such as tweets and chats to the platform. When a student adds an internet resource or uploads a photo/sentence set to her My Mictionary, the hyperlink to the particular new content will also be displayed on the social networking space, along with the student’s more ‘casual’ tweets. Our intention is to give each student a highly personalised space on the platform so that the students would not perceive MyCLOUD as an extension of the formal curriculum but rather a space where they can ‘seamlessly’ bring together casual socialising and language
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With such functionality being incorporated, students will be encouraged to use Chinese in social networking, thus creating a micro-environment of Chinese Language usage.

Furthermore, the platform can serve as a typical Learning Management System for the teachers to regulate and support student learning. That is where the teacher user interface comes in. As the MyCLOUD learning model will involve pedagogical revamp of regular Chinese classes (not just an add-on learning activity to the formal curriculum), a user interface for lesson orchestration will be made available to the teachers for planning and managing the pedagogical processes in regular lessons. A variety of features and tools will be incorporated, ranging from locking and unlocking selected or all platform features on in-class students’ devices, and classroom response system (see e.g. Fies and Marshall, 2005), to monitoring of MyCLOUD platform-supported small-group learning activities. Besides the classroom support, the system will detect and track students’ vocabulary usage in their My Mictionary, CoMictionary, social networking spaces and essays written with the platform, and collate relevant statistics on individual students and on the entire class. Such statistics are expected to assist the teachers in understanding the students’ language usage patterns and identifying their learning gaps. Certain parts of the statistics will also be visible to the students for their personal monitoring of learning progress.

6 Research methodological issues for SLL

Albeit a renewed interest in language learner autonomy, Little (2007) criticises that little research in general language classroom has focused explicitly on qualitatively drawing the relation between learner autonomy, the processes of language learning and the development of proficiency in the target language. We see a similar pitfall in the current MALL research. We strongly believe that a core issue in mobile-assisted SLL research is to collect and analyse data pertaining to both the seamless learning and language learning dimensions in order to understand how the students’ learning behaviours, the technology, and the theory-informed pedagogy interplay and lead to actual learning outcomes. In the seamless learning dimension, due to the perpetual and cross-context nature of students’ learning process, a variety of data collection and analysis methods should be employed, such as ethnographic methods, in-situ self-reporting, ongoing questionnaires and interviews, server logging and constant comparisons of these data sources.

In the language learning dimension, we intend to trace and analyse the full, recursive trajectory of students’ initial form-meaning linking (i.e. in-class vocabulary learning), individual contextualised learning process (i.e. content creation in My Mictionary, interactions within the social networking space), social decontextualised learning process (e.g. peer reviews in CoMictionary and in-class consolidation), and the construction of the mental lexicon. Students’ cognitive processes in artefact (photo/sentence sets) creation and peer reviews will be captured and examined. In addition, a corpus analysis tool will be integrated into the MyCLOUD platform to track individual students’ vocabulary usage in the tweets, sentences and essays that they compose within the platform. These data will be analysed through the lens of language learning theories, especially in terms of second language acquisitions. In addition, we will study how these productive and constructivist language learning activities may become a means of ongoing formative assessment on the students, rather than relying solely on semestral
school exams to track their learning progress or determine the learning outcomes. In turn, we will be able to derive guidelines for teachers to design and carry out such pedagogical tasks.

Apart from the seamless learning and language learning dimensions, there are important considerations for the technological aspect of SLL. Instead of positioning this aspect as a separate dimension in our socio-techno-pedagogical framework, we lump it into the seamless learning dimension. The rationale is that whereas our SLL learning process design has been surrounding the use of tablets as ‘learning hubs’, we would strive for pedagogy-informed, rather than technical-driven, design for learning activities and the platform. The learning and platform design is not meant to replace paper and pen or formal lessons, but rather to support the students in extending their classroom learning to their daily life. With the concern of the rapid obsolescence of mobile device models, we will develop the MyCLOUD platform to be device-independent in order to ensure sustainability of the learning model. A mobile client will also be developed for students and teachers to access to the platform with personal smart-phones.

In view of the complex interplay between the students’ learning experiences, the technology and pedagogy involved, we adopt DBR methodology, also known as design research or design experiments (Brown, 1992; Collins, 1992; Cobb et al., 2003), to conduct our SLL research. This method stresses upon systematic study on the interdependence of design elements, and the importance of examining emerging issues through progressive, iterative refining processes (Collins et al., 2004). It allows us to collect and analyse rich and relevant data to bear on the many simultaneously interacting factors that shapes the learning we envisage. This will then help to improve the design and shape the development of the technology and the pedagogy (Design-Based Research Collective, 2003).

7 Conclusion

We have examined the trend of modern language learning theories and found them congruent with the general learning philosophy of the 21st century, such as seamless learning, that advocates the nurturing of learners who can positively direct their learning and collaborate with others. The ubiquitous and cloud computing technologies may mediate and support assimilation of learning into the learners’ daily life. Nevertheless, instead of solely leveraging general, domain-independent learning notions to guide our SLL design, it is equally important to incorporate subject matter-specific learning theories in developing learning models that would provide concrete methodology to ensure deep learning of relevant knowledge and skills. A common limitation of prior vocabulary-focused MALL studies is that they rarely go beyond behaviourist or contextualised learning. Our proposed SLL framework aims to address this limitation. Informed by psycholinguistics, we recognise the importance of facilitating learners in constructing their mental lexicon, especially for L2 learning. We therefore incorporate mental lexicon-related learning activities to assist the learners in synthesising their vocabulary learning, as well as address the limitation of similar prior learning design of ignoring the contextualised stage by exploiting the affordances of ubiquitous technology. Indeed, our SLL framework emphasises closing the loops in both the seamless learning dimension (to foster 21st century knowledge and skills) and the domain-specific language learning dimension (to nurture holistic language competencies) through the ongoing learning process mediated by the ubiquitous technology.
References


Towards a SLL framework mediated by the ubiquitous technology


