A Wiki Technology-Supported Seamless Learning Approach for Chinese Language Learning

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This paper reports an intervention study on Singapore primary five (fifth Grade) students' ICT (information and communication technology)-mediated Chinese idiom learning. We introduced "seamless learning" to the learning design, that is, the bridging of formal and informal learning, and individual and social learning, conforming to the current trend of language learning which emphasizes more on communicative and authentic learning activities. Our study lasted for ten months. In the formal learning context, the teacher conducted in-class contextualized learning activities and group activities. In the informal learning context, students made sentences by using the idioms to describe their encounters in day-to-day life and post them onto a class wiki space for sharing peers' review. Meanwhile, students learned from and performed peers' views on the wiki by commenting on, correcting or improving their peers' sentences. Through our analysis on the empirical data, it was found that the new ICT-mediated learning could effectively help students synergize the formal and informal, as well as the individual and social language learning spaces.

Keywords: computer-assisted language learning, Chinese language learning, seamless learning, wiki, social media

Introduction

In recent decades, we witness a paradigm shift in language learning theories from behaviourism to a communicative, contextualized and constructive approach (Salaberry, 1996). The latest refinements place greater emphasis on using language in authentic social contexts (West, 2002). The field of CALL (computer assisted language learning) also follows this trend. Whereas behaviorists have still been applying the technology to support rote learning of vocabulary and grammar, scholars who carry a communicative view in language learning have been advocating the use of technology to promote interactive and productive (i.e., content creation) activities. With the proliferation of ICT (information and communication technology) tools, there is such a trend that transforming formal education from teacher-centered "spoon-feeding" to student-centered participatory learning, bringing technology into daily learning activities, transforming students from passive knowledge receivers to active knowledge builders (Warschauer & Healey, 1998; Xie, 2007).

In this paper, we focus on reporting our school-based empirical study of "Move, idioms!" in Nan Chiau Primary School, Singapore. The learning design was grounded in the notion of seamless learning that encompasses in-class formal learning an out-of-class informal setting, individual and social learning spaces, as well as the physical and cyberspace contexts. In the study, we facilitated a primary five (11-year-old) class to

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study 48 Chinese idioms (with four conjunctions in the later part of the study to experiment on the versatility of the learning design) over ten months. During the in-class/campus idiom/conjunction lessons, students learned idioms with idiom animations as well as contextualized and small-group learning activities (collaborative). In the afterschool setting, students made sentences with the idioms/conjunctions they learned and posted these sentences onto a wiki space for both out-of-class and in-class peers' review (collaborative). Apart from standard wiki features, such as multi-user content editor and page history, an online forum-style comment tool was incorporated on each wiki page in order to assist students to compare and discuss different contexts of the idioms/conjunctions.

In this paper, we will present the learning process design, students' in-class and after-school activities, and challenges that we faced in this study, and discuss whether the learning design is indeed conducive in fostering a seamless learning experience.

Literature Review

The term "seamless learning" was initially used without any consideration of technology as an essential component. American College Personnel Association (1994) stressed the importance of linking students' in-class and out-of-class (but still in-campus) experiences to create seamless learning and academic success. Kuh (1996) further elaborated the notion by extending it to involve off-campus experiences:

> The word "seamless" suggests that what was once believed to be separate, distinct parts (e.g., in-class and out-of-class, academic and non-academic; curricular and co-curricular, or on-campus and off-campus experiences) are now of one piece, bound together so as to appear whole or continuous. In seamless learning environments, students are encouraged to take advantage of learning resources that exist both inside and outside of the classroom...students are asked to use their life experiences to make meaning of materials introduced in classes... (p. 136)

Focusing on integrating formal and informal learning, Kuh's (1996) exposition stimulated further discussions (Bell, 2000; Seifert et al., 2008) and inspired further relevant studies (Smith & Northrop, 1998) on this learning model, though with varied emphasis. Other researchers added the dimension of learning community (MacGregor, Tinto, & Lindbald, 2001; Tinto, 1998) and the intertwining of individual and collaborative learning (Kazmer, 2005; Skop, 2008) into the notion.

Relevant prior literature discussed how technology may support and enhance seamless learning. For example, Bonner, Berry, and Marianovic (1995) described how their conceptual model of distributed multimedia university can support the seamless learning activity of obtaining multimedia learning resources that suit their day-to-day learning or problem-solving needs. On the other hand, Kezar and Rhoads (2001) posited that seamless learning can be extended to MUD (multi-user dungeons), online chat rooms, student hostels, sports fields and community service activities, among others, which essentially refer to bridging physical and digital spaces. Similarly, Taylor (2004) explored the use of network technology to integrate the learning spaces at home and in the school. A more ambitious and influential work is Chan et al. (2006), an international synthesis of the topic of one-to-one (one-or-more-mobile-device-per-learner), 24×7 (24 hours a day, seven days a week) setting to support seamless learning. The publication introduces the notion to the research field of mobile and ubiquitous learning and subsequently inspires many other relevant studies (El-Bishouty, Ogata, Ayala, & Yano, 2010; Looi et al., 2010; Maldonado & Pea, 2010; Otero, Milrad, Santos, Veríssimo, & Torres, 2009; Wong & Looi, 2010b).

Schank (1999) discussed about the sense-making or meaning-making nature of learning—not to merely

react to stimuli but looking to organize new information that they encounter so as to find meanings, significance or patterns in it. This view is congruent to the essence of seamless learning that advocates learners' active meaning-making on their daily encounters, rather than relying only on in-class passive knowledge transmission by their teachers in their learning activities (Wong, 2012; Wong & Looi, 2011). Such a principle is applicable to language learning, too.

In language learning, "closed", mechanical exercises restrict information to only "correct" answers that are unlikely to remain in permanent memory (Stevick, 1996). As a fundamental component of language learning, vocabulary learning is often delivered in conventional ways, such as providing abstract definitions and sentences taken out of the context of daily use (Miller & Gildea, 1987). Recognizing both the importance and the limitation of formal and in-class language learning, language learning theorists have been advocating the integrations of formal and informal language learning (Spolsky, 1989; Titone, 1969), which mesh well with the notion of seamless learning. An appropriate seamless learning design should be able to inspire students' interests to learn a language in realistic and engaging context, as well as to synergize what they learnt from real-life setting with what they learned in the classroom. In particular, the integration of individual and social learning could be further enhanced by blending mobile and Web 2.0 technologies to bring to the students the situated mobile learning experiences that take into account both the students' everyday tasks and socio-constructivism (Winters, 2007). Such integration could balance and bring out the best of both individual and social learning.

Informed by the notion of seamless learning, we developed a cyclic, customizable learning experience design of "Move, idioms!". Nation (2001) proposed three psychological processes for successful vocabulary learning: noticing (a word is highlighted as being salient text input), retrieving (repeat encountering of the word) and creative/generative (a previously encountered word is used in a slightly different context). The three-stage model stresses the importance of the coupling of language input (receptive learning) and output (productive learning), and the learners' creative/generative usage of the learned vocabulary in alternative contexts. As a tool that supports students in their daily learning activities, whether can ICT be used to carry out such a learning design? Based on these theories, how to create an innovative learning method or environment to help students carry out seamless language learning?

Study Descriptions

Our school-based study of "Move, idioms!" took place from January to October, 2010. We adopted the design-based research method (Brown, 1992; Collins, 1992) that involved identifying a problem and through rigorous research to provide solutions, which are then improved upon over a number of iterations of testing and implementations. Design-based research is to overcome the limitations of historic experimental design or quasi-experimental design, which over-relies on statistical analysis of pre-/post- test, as school-based implementation of pedagogical design are typically very complex and difficult to control multiple variables. Conversely, design-based research does not emphasize the presence of (and often does not need) of a control group. Instead, it focuses on qualitative analysis and understanding of students' learning processes and attempts to find out the association between the pedagogical design and outcomes (Bereiter, 2002).

In our study, we designed a customizable learning process to engage students in ongoing Chinese idiom learning and sentence-making activities. A class of 42 11-year-old primary five students, with mixed abilities in Chinese language, participated in the study. Forty-eight idioms and four conjunctions were selected from

students' Chinese textbooks as the target idioms to learn. Sponsored by a Taiwanese digital content developer, online comical animations that depict the meanings of the learned idioms could be assessed by the students both in school and at home (with their home computers). In the formal learning context, the teacher facilitated the students to watch the idiomatic animations, followed by conducting in-class contextualized learning activities and group activities. In the informal learning context, students observed their surrounding environments and made sentences by using the idioms to describe their encounters (which is a form of individual meaning making).

Furthermore, we adopted the open source xwiki (Website, http://www.xwiki.org) for students' informal learning activities. The "Move, idioms!" wiki space is password protected and only made accessible for the participating students, teachers and researchers. We set up an account for each student and created one page ("idiom page" thereafter) for each idiom covered in the class for the students to post their sentences. This offered convenience for comparing student-identified contexts and their sentences pertaining to the same idioms. Apart from standard wiki features, such as multi-user content editor and page history, online forum-style comment tool is incorporated on each idiom page.
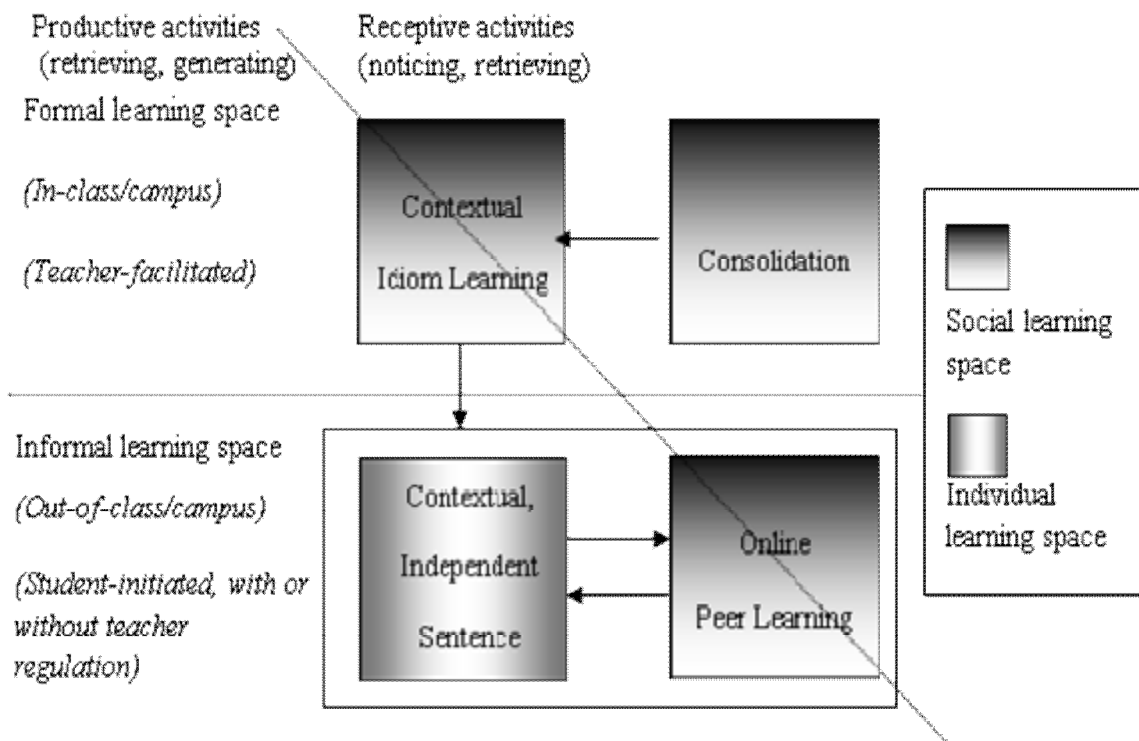

Figure 1. "Move, idioms!" learning process.

Figure 1 depicts the learning process design of "Move, idioms!". The design is an instantiation of Wong's (2010a) FSL (facilitated seamless learning) design framework (Wong & Looi, in press), which has previously been applied to designing mobile-assisted language learning (Wong & Looi, 2010b) and science learning (Zhang et al., 2010) activities. The four-activity process is iterative and encompasses formal and informal learning settings, individual and social learning spaces, and receptive and productive activities. During the study, we conducted "collaborative inquiry" (Darling-Hammond, 1996; Wong, Gao, Chai, & Chin, 2011) with

three Chinese language teachers. Collaborative inquiry is based on the notion that collaboration between research and practice is likely to advance both knowledge and action (Batliwala, 2003). As teachers assume equal status with the researchers with their practical experiences being respected, we argued that such a co-design method would deliver techno-pedagogical models with greater scalability (i.e., to be rolled out to more classes and become routine learning activities) and sustainability.

Activity 1—In-Class Contextualized Idiom Learning

The classroom/in-campus activities, co-designed by the participating teachers and researchers in the form of lesson plans, were conducted with the aim of effectively carrying out the noticing and retrieving processes in Nation's (2001) framework as well as motivating and preparing students to engage in subsequent out-of-school activities (generating) (see Figures 2 and 3). During the ten-month study, we and the teachers co-developed 12 Activity 1 lessons. Each lesson lasted one to one hour and a half and covered four to five idioms. We developed a five-stage in-class curriculum design framework (see Table 1) to provide a higher level guide to the lesson design. For each stage, it can be composed by one or several idiom lessons, teachers were supposed to decide when to promote to the next stage according to students' learning progresses. In addition, we advised the teachers to follow the "simple-to-complex" principle in selecting idioms to cover in different lessons. For example, "straightforward" idioms, such as "五颜六色" (colorful), "眉开眼笑" (smile from ear to ear) were covered at the earlier lessons before the more allusive "掩耳盗铃" (bury one's head in the sand) was incorporated. Furthermore, the teachers tied up the choice of idioms with the upcoming festivals or school events, such as covering "人山人海" (a sea of people), "张灯结彩" (be decorated with lanterns and colored streamers) and "兴高采烈" (be jubilant) right before the Chinese New Year. That increased the chances for the students to apply the idioms.

Idiom is a type of traditional Chinese linguistic expressions which are mostly derived from ancient literature but still common in vernacular Chinese. Like the idioms of other languages, the meaning of an idiom (known as "figurative/idiomatic meaning") usually surpasses the sum of the meanings carried by four characters (known as "literal meaning") (Kovecses & Szabco, 1996). This is because many of the idioms are intimately linked with the myths, folklores or historical facts from which they were derived. As such, idioms do not follow the usual grammatical structure and syntax of the modern Chinese spoken language and are instead highly compact and synthetic (Mei, 2008). With the overall circumstances of the Chinese language education in Singapore and typical Singaporean students' mindset in mind, we facilitated the students to watch Web- and Flash- based animations of the 48 idioms and four conjunctions at the beginning of each classroom lesson. Each idiom animation lasts for around one minute with humorous dialogue. Instead of studying the context from which an idiom was originated (where Singaporean students usually find them distance and unable to associate with), these animations have been able to draw students' attentions easier for them to comprehend.

Figure 4 features screen captures of four idiomatic animations, from top left, with the figurative translations of the idioms being underlined:

Husband: "Why are you watching the soccer match with all your eyes?" (Because the wife has a crush on the handsome soccer player)

Dad: "Why do you look so dead tired?" (Because mum was hooked on wiki Sports for hours)

Sister: "Bro, forging your score is just like burying your head in the sand".

Friend: "Bad things come in threes…today."

Table 1

The Five-Stage In-Class Curriculum Design Framework of "Move, Idioms!"

Stage	Learning goals	Recommended in-class idiom learning activities	Recommended small-group activities
I	(1) Promote idiom learning motivation (2) Understand the meaning and applicable contexts of each idiom (3) Improve the ability to identify the usage of each idiom	(1) Teacher to explain the meaning, functionality, applicable contexts of each idiom (2) Teacher to assess students' understanding of each idiom	Teacher to flash sentences for students to judge the correctness of idiom usage
II	(1) Enhance understanding of the applicable contexts of individual idioms (2) Use idioms to make sentences pertaining to the contexts given by the teachers	(Same as above)	Teacher to flash photos to let students put forward related idioms and make sentences, then post them on wiki
III	Able to incorporate several idioms in writing a short paragraph to present a context	(Same as above) + Teacher to identify or create a context (with multimedia presentation, such as PowerPoint slides or a video) and use several idioms to describe the context	(Same as above)
IV	Able to identify and incorporate relevant encounters or experiences from daily life into context	(Same as Stage I)	Students to identify or create contexts in class or on campus relevant to the learned idioms, perform skits, write paragraphs and post them onto wiki
V	Observe from daily life to imagine or create context, and describe the context by using idioms	(Same as Stage I)	Teacher to organize context creating competition, provide weekly competition theme to guide student in identifying relevant encounters in daily life to make sentences or write paragraphs, then post them onto wiki

Figure 2. Group discussion.

Figure 3. Group performance.

Activity 2—Out-of-Class, Contextual, Independent Sentence-Making

Apart from watching the animations repeatedly with their home computers, students proactively identified or created contexts in their daily lives which could be associated with any idiom. They then made sentences by using the idioms to describe those contexts. Thus, students' idiom learning was not only confined in classroom, but extended to after school hours. Figures 5 and 6 depict screenshot excerpts of wiki pages of "东倒西歪" (figurative meaning: tilted; stagger; at sixes and sevens) and the conjunction "虽然……但是……" ("although… (but)…") respectively. The number that follows each sentence was the class index number of the student who composed the sentence.

Figure 4. Screenshots of idiomatic animations.

东倒西歪

半夜里刮起了大风，把屋后那棵木瓜树吹得东倒西歪。（19）

飓风把树吹得东倒西歪，连根拔了！（22）

车子走在不平的路上，不停地摇摆，车上的乘客也跟着东到西歪。（23）

大风把大树吹得东倒西歪，差一点就连根拔起。（9）

我的阿姨很会讲笑话，我们听了她的笑话都笑得东倒西歪。（14）

Figure 5. Screenshot excerpt of "东倒西歪" ("tilted; at sixes and sevens").

虽然但是

虽然他失败了好多次，但是他仍然不放弃，终于获得了讲故事比赛的冠军。（28）

虽然妈妈已经累得筋疲力尽，但是她还坚持给我们讲故事听。（28）

虽然小佳很用功读书，但是他的考试成绩仍然很差。（12）

虽然文明害怕老师会因为他犯的错误而责骂他，但是他还是鼓起了勇气，向老师承认了错误。（7）

虽然他考得很好，但是他很骄傲。（14）

Figure 6. Screenshot excerpt of "虽然……但是……" ("although … (but) …").

To benefit international readers, we translated the sentences as follows (with the figurative meanings of the idioms being underlined):

Sentences in Figure 5 are as follows:

(1) The tree behind the house is tilted after being blown by the strong wind in the midnight;

(2) The tree is tilted and uprooted by after being blown by the hurricane;

(3) The car travels on a bumpy road, keeps rocking, making the passengers stagger;

(4) The tree is tilted and uprooted by after being blown by the strong wind;

(5) My aunt is good at telling jokes. We laugh and stagger when hearing her jokes.

Sentences in Figure 6 are as follows:

(1) Although he failed many times, he refused to give up. Finally, he won the first prize at the story telling competition;

(2) Although mum is completely worn out, she still insists to tell stories to us;

(3) Though studying hard, XiaoJia still did not do well in his exam;

(4) Though afraid of being scolded, WenMing still plucked up courage to admit to the teacher his fault;

(5) Although he performed well in exam, he was arrogant.

Both sets of sentences show the students' good understanding in the diversified usage of the idiom or the conjunction. For example, most of the students were not aware that "东倒西歪" (see Figure 5) can also be used to describe humans (the third and fifth sentences), other than objects, such as trees. This was because they first encountered this idiom in their textbook that was pertaining to the specific context—a tilted tree. It was the wiki-based seamless/informal learning activity the helped these students in broadening their understanding in alternative usage of the idiom—through reading and reflecting upon the contents generated by their peers which they found more relevant to their own lifestyles than typical teacher-provided learning materials.

Activity 3—Out-of-Class, Online Peer Learning

Students learned (receptive) from and carried out peer's reviews on the wiki by commenting on, correcting or improving their peers' sentences by making direct modifications on the sentences (using different font colors but retaining the original sentence) posted on the wiki pages (productive) (see Figures 7 and 8). Teacher participated in the discussions from time to time without directly giving away correct answers. Instead, she often attempted to promote student-student discussions by applying some online forum facilitation strategies (Wong & Looi, 2010a). Therefore, the student-student and student-teacher interactions were not restricted to the classroom lessons. The comparison act is a form of inductive learning that may help students to rise above their earlier contextualized learning of the idioms.

Figures 7 and 8 depict excerpts of the peer discussions on two different idiom pages.

, 2010/04/11 09:15

(23)的句子，第二个"巴沙"应该是'巴刹'.

n, 2010/04/11 12:04

8，新年时应该是牛车水热闹，不是乌节路。24

m, 2010/08/14 16:44

38 我绝得你其实想要写的是（圣诞节快到了,乌节路人山人海,好热闹！）吧

m, 2010/08/14 16:45

应为如果是圣诞节，乌节路哪里不会热闹呢？？

Figure 7. A screenshot excerpt of "人山人海" ("a sea of faces") comment space.

The four comments on Figure 7 (pertaining to the idiom "人山人海", i.e., "a sea of faces") are translated below,

Pertaining to the sentence by (23) (Note: the index number of the student), "巴沙" should be written as "巴刹" (The student pointed out an erroneous word; the Chinese word means "bazaar", i.e., food market).

Sentence by (8)—During Chinese New Year, it should be Chinatown that is crowded, not Orchard Road (Note: Orchard Road is the retail and entertainment hub and a major tourist attraction of Singapore).

Sentence by (8)—I believe what you wanted to write was that "Christmas is around the corner. There has been always a sea of faces on Orchard Road".

Yes, Orchard Road is certainly very crowded during Christmas.

2010/03/25 19:56
35号的句子写得很奇怪，为什么不写前天的狂风大雨把这棵树吹得东倒西歪呢？27

2010/04/22 10:20
38号的句子很奇怪。你说乌云密布,那都没有风,树哪里可能东倒西歪呢？

2010/04/22 10:25
12号的句子写得很好！！！！！

2010/09/16 17:15
yen ee，３８号是对的，因为通常乌云密布是用来形容风很大，快要下雨了

Figure 8. A screenshot excerpt of "东倒西歪" ("Tilted; at sixes and sevens") comment space.

The four comments on Figure 8 (pertaining to "东倒西歪", i.e., "Tilted at sixes and sevens") are translated as follows:

(1) The sentence by (35) sounds strange. Why did not you write that "A squall of rain the day before yesterday had titled the tree"?

(2) The sentence by (38) sounds strange. You only wrote about "乌云密布" (Note: literally means "clouded over") but not mentioning strong wind. How could the tree be tilted?

(3) The sentence by (12) is a good one!!!!!

(4) I think the sentence by (38) is correct. The idiom "乌云密布" is often used to describe the weather that is windy and on the verge of rain.

From language learning's point of view, we observed a significant difference between the discussions as depicted in Figures 7 and 8. The discussion in Figure 7 focused more on "validity" of the sentence contexts (i.e., which part of Singapore is more crowded during a particular festive season) rather than the idiom usage itself. The discussion in Figure 8, on the contrary, looked into the meaning and contextual usage of the idiom. Since the sentence by student No. 38 also incorporates an additional idiom, "乌云密布" ("clouded over"), the discussion were also extended to the meaning and usage of that. From psycholingustics' point of view, the students who were involved in and/or reflected upon the discussion might have, therefore, mentally established the relation between "乌云密布" and the original target idiom of the page, "东倒西歪" ("tilted"), in the specific context. Such a deep learning process is congruent with the view of "learning as a form of meaning-making" which we wish to analyze further to unveil its implication to language learning in general.

Activity 4—In-Class Consolidation

Possible activities include class-wide or small group discussions on selected sentences made by the students, or polling for "the most popular sentence" on each idiom page. During the consolidation classes, each

student group was assigned a few existing sentences on the same wiki page with a mixture of correct, ambiguous and erroneous usages of an idiom. The groups compared and revised the sentences if necessary. Subsequently, teacher-led classroom discussion made contradictory views among the groups surfaced, facilitating class-wide debates for potential knowledge construction.

Discussion and Conclusions

Within the ten-month period, the 42 students contributed a total of 1,042 sentences and posted 416 comments. Through the artifacts that they generated, the students demonstrated their creativities not only by identifying contexts that associate with specific idioms, but also by revising or commenting through peers' review. We found that computer-assisted learning is very popular among students—this is evident from the post-activity survey, where students unanimously replied "Agree" or "Strongly agree" on questions pertaining to their perceptions on participating in "Move, idioms", even though there were two students replied "Disagree" or "Strongly disagree" respectively to the questions on whether they liked to access to the wiki from home, and whether they liked to participate in peer review activities. We have also observed that the new learning mode is also effective in helping students integrate individual and social learning, as well as formal and informal learning. However, due to the time constraint, Chinese teachers' participations in the students' informal learning space were inadequate. Students' beliefs, abilities and habits of self-directed learning and knowledge constructions in informal setting need to be fostered and further guided by teachers.

Despite of these challenges, we found that the learning model promises a great potential in motivating students in actively engaging in seamless learning. This design not only focuses on the integration of in-class/campus formal learning and out-of-class/campus informal learning, combination of students' language input and output, but also the integration of individual contribution and social consolidation. As authentic learning, i.e., learning activities that are framed around real-life context comes into the picture of language teaching (Mishan, 2004). Our design becomes a viable solution to the blending of the language learners' learning environment into their real-life contexts. As learner-created contents are derived directly from authentic environment, they are by nature a better reflection of students' language expression styles and perceptions on the idioms learned. Their potential erroneous usage can also surface more easily. We believe that such student-created contents can constitute the more effective learning resources than teacher-provided or Web-searched contents provided the erroneous or ambiguous student artifacts can be well addressed by peers or teachers at the consolidation stage. The Web 2.0 technology provides the convenience for the students to carry out such blended learning activities and get their work and comments organized to facilitate holistic contextualized-to-inductive idiom learning.

All in all, we observed a trajectory of seamless learning and personal-to-social meaning-making from students' artifacts—at least for those who are keen about out-of-class sentence-making. For the social learning aspect, accumulated "meaning-making" provide students with source of sustaining their discussions and reflections. The design conforms to nation's noticing-retrieving-generating process and transforms the Chinese Language class into an authentic learning experience. Therefore, we believe that apart from mastering of the idioms and conjunctions covered in the lessons, the students had also been picking up the communication and analytic skills. With our successful intervention at the experimental class, we foresee the potential of seamless language learning to revolutionize language learning by breaking the instructions and learning experience beyond the four walls of the traditional classroom.

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