

Mandarin Communication Learning app: A proof-of-concept prototype of contextual learning

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This paper is an instance of how a Chinese language teacher trainer cooperated with a game-based learning (GBL) researcher to design and develop a mobile application for learning daily communication in Mandarin. The teacher trainer intends to assist beginning learners, specifically those who speak Malay as their first language, to establish confidence in speaking Mandarin in Malaysian's daily living contexts; while the researcher has set out to test the ecological validity of a GBL cooperation model. The interdisciplinary cooperation between these individuals has given rise to the production of a Mandarin communication learning application. The key challenge encountered in the development has been to determine the choice of contents and communication contexts for beginning learners. This paper illustrates how the challenges have been resolved and discusses lessons learnt from the cooperation. The outcomes of the study would benefit academics, GBL researchers or developers who plan to initiate cross-disciplinary cooperation towards developing language learning applications.

Keywords: Mobile application; Mandarin communication; cooperation model; contextual learning; game-based learning.

Introduction

Mandarin is one of the preferred third languages among non-Chinese Malaysian undergraduate students (Ainol Madziah & Isarji, 2009). Proficiency in Mandarin would be an added value to the students, particularly "when dealing with Mandarin-speaking businessmen in Malaysia" (Ainol Madziah & Isarji, 2009). Apart from students who take major or minor courses related to Chinese language, most of the students do not have the resources to spend on intensive Mandarin courses, due to the competing demands from their own major and minor courses. This situation prompted the idea of creating a mobile application or app to assist non-native speakers to learn Mandarin communication. The idea has been initiated by a Chinese language teacher trainer in early 2013 in which she approached a game-based learning (GBL) researcher in Sultan Idris Education University (UPSI) to produce a Mandarin communication learning application. This paper depicts how the cooperation between the trainer and the GBL researcher to design and develop the mobile app (Figure 1).

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Figure 1. Splash screen (left) and menu screens of the Mandarin Communication Learning App

Mandarin communication

According to Li and Thompson (1989), Mandarin is the term that “represents the speech of Beijing, which for centuries has been recognised as the standard language of China because of the political and cultural significance of that city”. It is one of the seven major dialect groups in China, in which over 70 percent of the total population in Mainland China use Mandarin in daily communication (Li & Thompson, 1989). This concept of Mandarin is denoting *Putonghua* or ‘common language’ in Mainland China and *Guoyu* or ‘national language’ in Taiwan (Li & Thompson, 1989). However, people living in Malaysia generally perceive Mandarin as the formal Chinese language for Malaysian Chinese, as opposed to other dialects like Hokkien, Hakka or Cantonese. Also, Malaysian Chinese regard Mandarin as *Huayu* which literally mean ‘Chinese language’. To avoid confusion with other dialects like Cantonese that has been recognized also as a Chinese language outside China (Bauer & Benedict, 1997), the mobile app discussed in this study is named as *Pembelajaran Komunikasi Mandarin* or Mandarin Communication Learning, instead of Chinese Communication Learning.

Mobile language learning applications

Mobile application, or commonly regarded as mobile app, is a form of application software created to operate on mobile devices like Smartphone and tablet computers, in which it enables the mobile device to perform practical tasks beyond the operation of the device itself (adapted from Alexander, 2013). Apps that are designed specifically for language learning are classified as mobile language learning apps, regardless of the types of content and the choice of pedagogical approach.

Learning language skills through mobile app is not new, as mobile assisted language learning (MALL) approach has been established since the proliferation of

smartphones like iPhone worldwide in year 2007. For instance, Ahmad Zamzuri and Segaran (2013) produced a mobile app that features language learning for non-native English speakers through 3D talking-head based on MALL principles. In the case of Mandarin, there are quite a number of mobile apps dedicated for learning Mandarin through various approaches. For example, Shih, Chen and Li (2010) developed a mobile Mandarin learning system by using theory of inventive problem solving or TRIZ; while a research group directed by Tian (2010) across Beijing and California studied 25 traditional Chinese group games in order to design two group-learning games on mobile phones—the Multimedia Word and the Drumming Stroke. R&D teams led by Darren Edge had been proactively designing mobile learning app for Mandarin. Based on microtraining and microlearning approaches, they created the Micro Mandarin app to provide contextually relevant content in the world's major cities (Edge et al., 2011), and also a game named as Tip Tap Tones to help learners acquire the tonal sound system of Mandarin Chinese (Edge et al., 2012).

Contextual learning approach for language acquisition

Language learning is a form of visceral mechanism of human development (Norman, 2004). This statement echoed the hierarchy of needs proposed by Maslow (1943), in which at least one language is required by every human being to fulfill the physiological and security needs. Contextual learning has been recognized as a potential language acquisition approach to satisfy the needs mentioned above. According to Wenger and Lave (1991), when learners are situated in a realistic context, they will actively construct knowledge for use in the specific context. Multiple stimuli or perspectives upon the principles or theories to be learnt could be provided through authentic learning environment or context, and this would require context-dependent and interconnected knowledge (Spiro, Coulson, Feltovich & Anderson, 1988). Variability in learning events which are afforded through authentic context may yield better construction and generalization of knowledge among the learners (see Spiro et al, 1988; Kester, Kirschner & Van Merriënboer, 2006; Sweller, Van Merriënboer & Paas, 1998). This in turn would improve recall of learning outcomes as the stimuli shown during the recall, i.e. an authentic context, would be familiarized to learners because they had learned the contents in appropriate contexts. In other words, for adult learners who can make sense of real life contexts, they should be guided to construct their own language acquisition, e.g. what to say and how to say in order to communicate in a specific context. In practice, De Jong, Specht and Koper (2008) reviewed current supporting systems for mobile contextualized learning, and proposed a five-dimension design approach, which covers content, context, information flow, pedagogy model and purpose for mobile app creation.

Apart from the contextual learning approach, the design of the *Mandarin Communication Learning* app is grounded on the conversation theory, which depicts the process of knowing conversation as a continual sequence within and between entities, which include individuals, groups and technologies (Pask, 1976). This prototype app intends to enable learners to converse in similar contexts as depicted in the app. The learning materials prepared in the app were supplied by potential learners with similar national and socio-economical backgrounds, thus matching their current understanding, and this could provoke and facilitate dialogue and discovery learning after they go through the app.

The production of the *Mandarin Communication Learning* app

The production *Mandarin Communication Learning* app is a joint effort of a Chinese language teacher trainer and a GBL researcher. The app is a proof of concept prototype that

aims to demonstrate how Mandarin communication learning could be made possible for Malaysian students whose first language is Malay. Therefore, the release of the app is indeed a minimum viable product (MVP), which is “a bare-bones product that includes just enough features to allow useful feedback from early adopters,” and the production team would continue “hypothesis testing with a success of incrementally refined product versions” (Nobel, 2011). The production was physically carried out in UPSI Education Research Laboratory, Perak, Malaysia between February 2013 and June 2013. By adopting agile development methodology (Larman & Basili, 2003), seven individuals played different roles in the production team: production manager, subject matter expert (the Chinese language teacher trainer), game designer, programmer, graphic artist, audio artist and GBL researcher. Apart from the subject matter expert and the GBL researcher, other members of the team were in fact students pursuing their first degree. They joined the production either as freelancer or intern for industrial training under the GBL researcher.

Tan’s (2010) model of cooperation was implemented to combine the pedagogical strength in Chinese language and the expertise of GBL in UPSI (Figure 2). The need to cooperate between subject matter experts and game experts in order to produce pedagogically sound and engaging mobile games was justified by Tan, Neill and Johnston-Wilder (2012), in which they argued that “since subject matter experts and the game experts were only certain about aspects of educational games related directly to their field of expertise, they should collaborate, instead of working independently”.

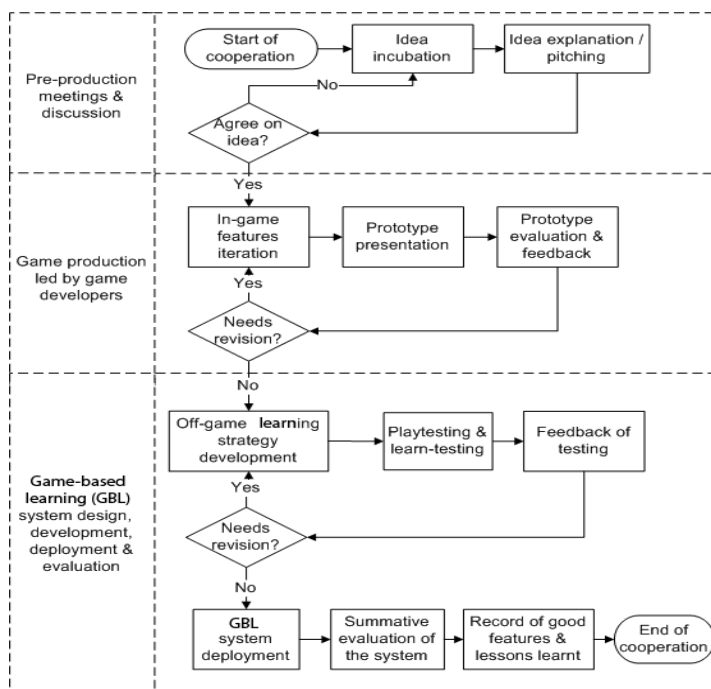


Figure 2. Cooperation model adapted in the created of Mandarin Communication Learning app.

In Search of suitable learning contents

In the first month of the project, the key challenge encountered by the team was identifying learning contents that would be suitable for the targeted learners. Throughout the production period, none of the mobile apps on Mandarin or Chinese language learning available in Apple App Store and Google Play were using Malay language as the medium of instruction. Thus there was no sample or reference mobile app that can represent the interest of Malaysian learners. This prompted the need to prepare original learning contents for the mobile app. A survey conducted in mid-March 2013 with 115 first year second semester undergraduate students who were pursuing either Bachelor of Design in Animation programme or Bachelor of Design in Advertising programme in UPSI. The students were requested to list down up to ten sentences that they wish to speak in Mandarin. 688 sentences were collected, in which 560 were written in Malay and 128 were in English (see Table 1).

Table 1. The sources of sentences used for identifying the theme learning contents.

Sources of ideas	Number of sentences		
	In Malay	In English	Total
Male	204	87	291
Female	152	19	171
Unknown gender	204	22	226
TOTAL	560	128	688

The sentences were sorted and four themes emerged from the sorted sentences, i.e. daily greetings, mutual introduction, teleconversation, and shopping. The four themes became the structure in searching suitable learning contents for the app. Table 2 shows the mock up learning contents prepared with reference to the sentences collected in the survey.

Table 2. Structure of the learning content for the prototype app.

Themes	Communication contexts	Selected sentences / phrases (in Malay)
Daily greeting	At home	Waktu pagi.
		Selamat pagi.
	At bus stop	Saya pergi ke sekolah.
		Jumpa lagi.
Mutual introduction	In a feast	Apa khabar?
		Khabar baik.
		Hai.
		Salam.
		Saya Ali.
		Nama saya Sheila / Fatimah.
		Salam sejahtera.
Nama mereka ialah Ah Ping dan Fatimah.		
Teleconversation	After school	Saya sangat gembira dapat berjumpa dengan kamu semua.
		Jom!
		Main bola sepak?

Themes	Communication contexts	Selected sentences / phrases (in Malay)
		Ya!
		Mari kita pergi bersama-sama.
		Saya ajak Muthu, samada Muthu mahu main bola sepak bersama-sama.
	Invitation	Helo
		Boleh saya bercakap dengan Muthu?
		Saya Muthu / Ah Ping.
		Siapa yang bercakap?
		Saya dan Ali hendak main bola sepak.
		Kamu hendak mainkah?
		Bagus.
		Bila?
		Di mana?
		Pukul 5 petang nanti.
		Kita berjumpa di padang kolej, bagaimana?
Shopping	Night market	Waktu malam
		Beli apa?
		Saya mahu beli buah-buahan.
		Yang mana satu?
		Saya mahu oren dan epal merah.
		Ini dan itu?
		Ya, terima kasih.

Designing graphics for the app

After structuring the learning contents, a student designer was recruited as the graphic artist to visualize the learning contexts for Mandarin communication. A discussion between the subject matter expert and the graphic artist was arranged to determine the place, time and mood of the contexts of communication. This was followed by storyboarding, in which the sequence of the content presentation was set. In terms of style, the production team proposed to adapt the look-and-feel of a digital comic, and each of the dialogue bubbles was made audible upon tapping. Figure 3 shows the screenshots of each of the learning contexts in the app. Apart from the comic-like contents, dedicated menu, icon and navigational buttons were designed for the app.

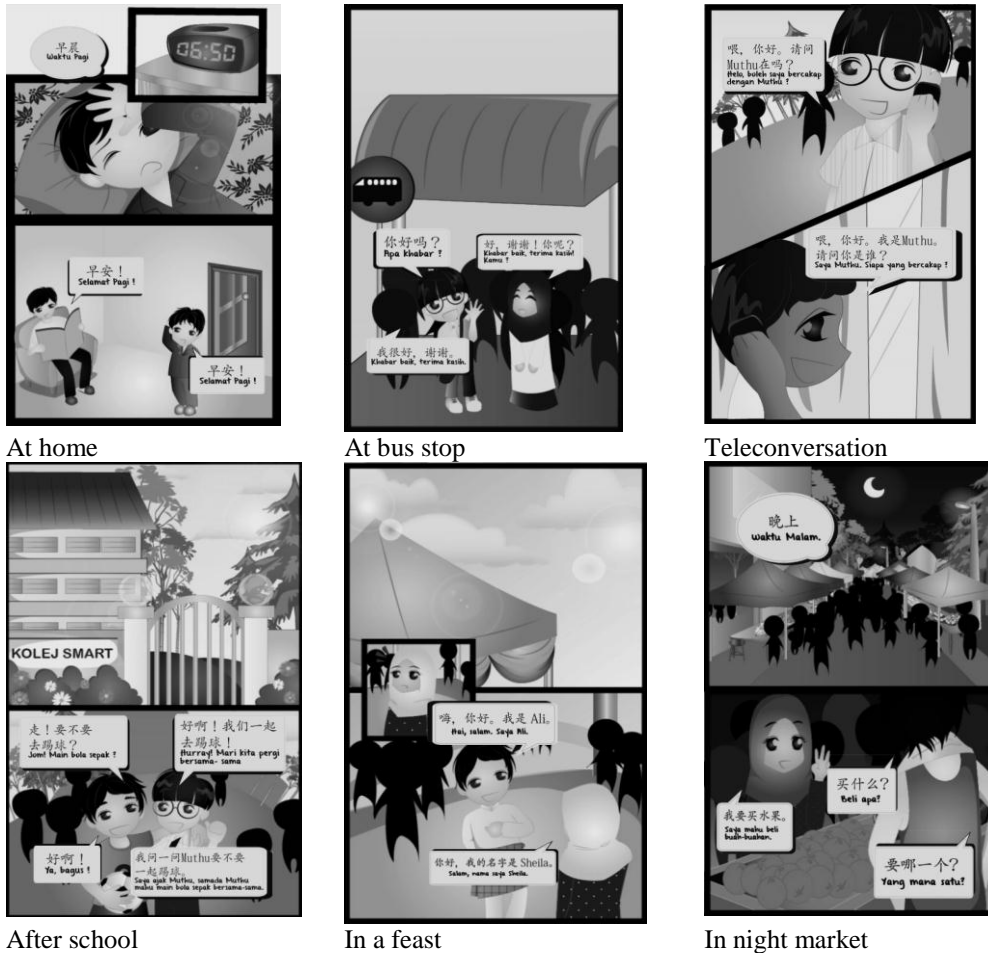


Figure 3. The comic-like graphic design of the learning contexts.

Playing as assessment for learning

The app features two mini language games: Tap-Release-Shoot (*Tekan-lepas-tembak*) and Restructuring Sentence. The first game requires player to look for correct Chinese words that match the simple sentences displayed within one minute. Player can check the pronunciation of each of the words to recall what had been learned in the digital comic. Figure 4 shows the paper-based prototype and the final look-and-feel of the Tap-Release-Shoot mini game. The second mini game challenges player to arrange words and phrases into correct sentence structure. Similar to the first game, player are given limited time to overcome the challenge. Figure 5 shows the paper-based design and the developed sentence structuring game.

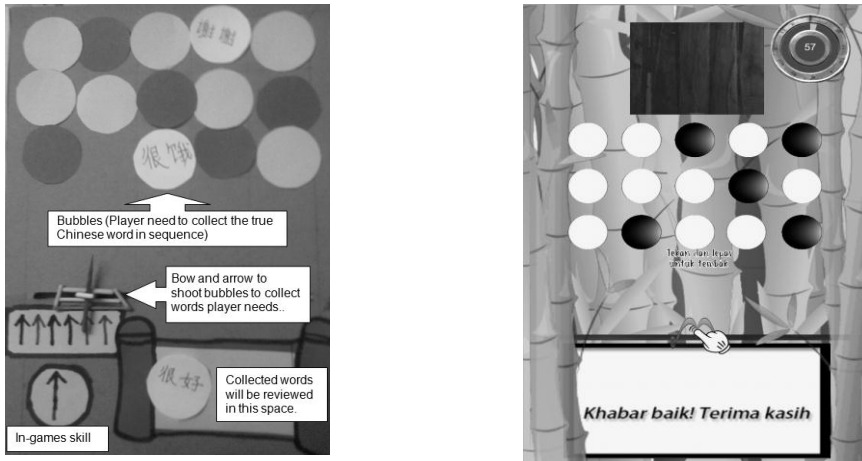


Figure 4. From paper-based design to the final Tap-Release-Shoot mini game

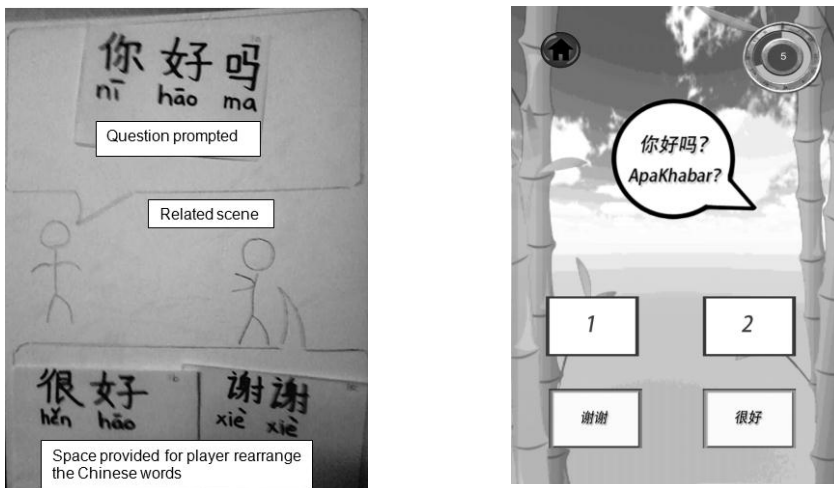


Figure 5. Comparison between the paper-based and the developed sentence structuring game.

Discussion

The applicability of the Mandarin Communication Learning App

The interest of learning Mandarin among non-Chinese in Malaysia has been accelerated by the rise of Mainland China as a world leading economy entity. Many learning channels and media were created either by multimedia experts or language experts, in which a huge amount of these materials were begun with teaching Chinese character writing and memorization. For those who missed the learning opportunity during their primary school study, learning to communicate in Mandarin could be very difficult because the psychological sense of speaking Mandarin to survive diminished after they have acquired communication skills in Malay, English or other languages. Under such circumstances, the common pedagogy that begins with repetitive Chinese character writing and memorization

without referring to specific learning contexts might not be practical to adult learners. The learners need to construct their own understanding, i.e. by linking their prior intellectual skills and life experience to the content and contexts Mandarin communication which they are learning. Hence the genesis of this prototype app, which aims to enable user to speak Mandarin in designated contexts without having to go through the repetitive Chinese character writing and memorization practice. Thus, the target users are Malay speaking adult learners who are familiar with daily living contexts in Malaysia.

The need for cross-disciplinary cooperation

Academic studies have been critiqued for being “too theoretical” by those working in the creative industry (Hopson, 2006). To counter this perception, academics should participate in creative content design and development, i.e. converting their research findings into products for the public. In other words, cooperation between academics, GBL researchers and experts in the creative industry could transform outcomes of academic research into sensible and meaningful products to the mass.

The Mandarin Communication Learning app presented in this paper is an example of a successful cross-disciplinary cooperation between a language teacher trainer and a GBL researcher. The completion of the app marks the justification upon the ecological validity and the trustworthiness of the model of cooperation (see Figure 2). According to Bryman (2008), ecological validity confirms whether or not the research findings are pragmatic to the everyday practice of research participants or subjects, under natural social settings. Thus, the five-month cooperation experience between February and July 2013, plus three months of revising and publishing the app has become a valid ecological ground for this cooperative model.

Nonetheless, due to the absence of both research fund and production budget, the team could not afford to hire professional designer or developer from the creative industry. While the usability and learnability of the prototype is acceptable in academia, the aesthetic quality and playability of *Mandarin Communication Learning* app do not reach the expectation of consumers as a paid product in Google Play. Thus, an obvious gap was revealed between a proof-of-concept prototype and a commercialized product. Therefore, unless sufficient fund for commercialization is provided to acquire support and involvement of professional designers and developers from the creative industry, the prototype would continue to suffer as a nonmarketable product.

Nevertheless, the cooperation model is a means to an end rather than an end in itself, wherein the ‘end’ in this sense refers to the use of *Mandarin Communication Learning* app among non-Chinese Malaysian. Thus, the cooperation should be extended beyond the production of the app, in which it should include andragogy strategies development and deployment. As for the leadership, both the subject matter expert and developers are equally important in the idea conceptualization and visualization process, but after that, developers should lead the app production, and then the subject matter expert directs the use of the app among the students.

Conclusion

While the interest among non-Chinese Malaysian undergraduate students to learn Mandarin is rising, these potential learners may not have the resources to spend on intensive Mandarin courses, due to the competing demands from their own major and minor courses. In this sense, mobile learning solution like the *Mandarin Communication Learning* app could meet the need of these learners.

The app is a proof-of-concept prototype that embraces contextual learning approaches, whose purpose is to establish the confidence to speak Mandarin in Malaysian daily living contexts among non-Chinese Malaysian adults. The content of the app is gathered through a survey conducted with 115 UPSI undergraduate while the design and development are carried out as a form of cooperation between a Chinese language teacher trainer and a GBL researcher in UPSI. The contents of the app are featured in five comic-like graphic representation of learning contexts which are authentic to Malaysian. Nonetheless, the choice and style of specific learning contexts are by no means exclusive, since the app has been created as a minimal viable product to proof the ecological validity of a GBL cooperation model and the feasibility of contextual language learning through mobile app.

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