

## ENGAGING LEARNERS WITH PERSONALISED T-MALL: DESIGNING THE ACTION PLAN

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### ABSTRACT

This paper relates the designing phase of a tablet mobile assisted language learning (t-MALL) environment targeting to increase the learners' engagement in the foreign language classroom through the inclusion of personalised and customised learning. Customising the students' access to learning material and support was expected to increase the students' exposure to the target language through personalized learning content and tools. The implementation of the t-MALL classroom sought to provide the students with a caring, supportive and learner-centred environment which could sustain their engagement during class activities. Therefore, in the designing phase, a critical review of the t-MALL literature was performed in order to compile existing theoretical and methodological concepts and recommendations pertaining to the integration of personal tablet computers in foreign language tertiary education. This article highlights the research gaps as well as the contributions from the critical review then explains the development of the action plan towards the implementation of tablet computers in the immersive language classroom.

**Keywords:** MALL; Tablet Computers; Foreign Language Learning; Action Research

### INTRODUCTION

According to the principles of social constructivism, the instructor facilitates the co-construction of knowledge among learners through learner-centred, meaningful and learner-controlled conceptual approaches as explicated in Brown (2001) and Hickey (1997). According to educational psychologists such as Bowman (2011) as well as Reschly and Christenson (2012), these approaches create a learning environment which promotes virtuous self-regulated factors leading to individual engagement and further learning. Therefore, incorporating tablet computers in the classroom was expected to provide the students with an extended access to learning tools and thus to promote self-regulated learning. In the field of technology mediated learning, facilitating conditions are central to the development of students' engagement. According to Lowther et al. (2003) an active pedagogy is effective if learners are guided either by their teacher or by their peers to gain autonomy and if developed within an open access to information. Kukulska-Hulme (2012) stated that technology mediated learning multiplies the opportunities for self-regulated learning and autonomy when learners have a ubiquitous access to learning resources and support tools such as with the generalisation of mobile devices' ownership.

In the present study, self-regulated learning in face-to-face settings was conceptualised so as to encourage the learners to become in control of their learning, individually and with their peers in order to incite them into developing their own coping strategies. This meant providing learners with flexible opportunities to consult textual, audio and video learning support material as well as to use technology to individually or collectively discuss, create and share their productions among classmates. The need to provide learners with a customised access to instructor, peer and technological support motivated the choice of tablet computers in order to improve the classrooms' technological facilities in terms of ubiquity and flexibility.

In this research, the term flexibility refers to the physical and to the technological aspects of classroom settings. Foreign language courses require flexible settings in order to accommodate all types of learning situations. Furthermore, an open access to resources, course content and support material is essential in promoting the learners' engagement through self-regulated learning. Facilities shape the learning context physically, emotionally and pedagogically. In the classroom, seating configurations often imply a hierarchical dimension which socially and pedagogically affects the learning environment by inferring interactions patterns. In the foreign language classroom, the learning environment needs to promote whole group, small groups as well as individual types of activities and interactions.

In the research site, all courses are planned according to a distinction made between lectures and practices. This is reflected in the timetable which assigns lectures in classrooms or amphitheatres and individual practices in computer laboratories. Lecture configurations give the speakers an almost unchallenged monopoly with special rules governing interruptions often in the forms of questions. In foreign language learning, this layout is useful for lectures, explanations, presentations as well as audio and video playback delivered to the whole class. It also stimulates individual work. Circular arrangements encourage individuals to voice their opinions even though interactions remain formal and controlled by the appointed facilitator such as in debates, round tables and meeting simulations. Alternatively, small groups provide a private space and thus favour collaborative work such as brainstorming, reflections, peer tutoring and discussions.

In classrooms and amphitheatres, the technological facilities feature a computer station connected to a projector and to the Internet. Conventional classrooms are generally quite flexible as they can be turned into various seating dispositions. The seating arrangements also enable the lecturer to move easily from one group to another and can accommodate group discussions. However, the learners do not have access to connected computer stations which was reported as slowing down brainstorming and interaction processes. Conversely, amphitheatres exemplify the most rigid settings with the lecturer facing immovable rows. Furthermore, the provided microphone is seldom wireless which confines the lecturer in the vicinity delimited by the cable's length. In other cases the microphone is fixed to a lectern which limits the lecturer's movement even further. For example, in the case of multimedia playback and animated presentations, the lecturer cannot control the computer while addressing the class through the microphone. In addition, without a wireless microphone the lecturer cannot reach the students sitting at the back of large rooms or amphitheatres and cannot cover the background noises of students' voices. In language classes, students are encouraged to practice the language and most of them would read out loud and repeat the sentences from the lessons. In large rooms, background noises are amplified and render interactions difficult.

Meanwhile, in computer laboratories, the teacher and each student have access to a computer generally connected to the internet. However, since most laboratories are equipped with desktop computers, the seating arrangements are set. The seating disposition can either be in rows facing a screen or organised in islets of four computers. Multimedia language laboratories using the latest technologies are locally networked together as well as connected to the Internet. The instructor can monitor and control all stations from the teacher console and interact with the students using headsets. The instructor can transfer files to the students' computers or open a particular website for the students to carry out tasks such as listening comprehension and grammar drills. Such a dispositive favours individualised learning, particularly since the system enables the learners to call their lecturer for assistance as stated by Gabarre and Gabarre (2009).

The learners can also be arranged in pairs or in groups to simulate conversations where they communicate among themselves and with the lecturer using headsets. However, these simulations lack the spontaneity and conviviality of face-to-face interactions. Since learning activities are taking place in the same room, communicating through headsets appear futile and most learners tend to put the headsets and screens away to pursue the task and discuss across the table. This of course annihilates the lecturer's ability to monitor and assist the students from the teacher desk. Most of the times, the learners move their chairs and gather around one station moving back and forth to their own computer stations whenever they need to collect more information. Therefore, the laboratory is used as a conventional classroom with the lecturer circulating

between groups of learners. Furthermore, the computer laboratories are quite noisy due to the network server hosted in the same room. If it does not really alter group discussions, it becomes a problem for larger group discussions as well as when the lecturer needs to address the whole class. This configuration is also uncomfortable for the stations with their back to the lecturer. Even though, the lesson's presentation is projected on all the stations, these learners cannot simultaneously see the presentation and the lecturer. In the case of language learning, not seeing the speaker impairs the ability to understand the explanations. Once again, the learners resort to moving their chairs so as to face the lecturer, a position less comfortable than in conventional classrooms. Moreover, computer laboratories also require a sophisticated maintenance from technicians and a well-trained instructor as stated in Ghavifekr et al. 's study (2011) on the Malaysian smart school ICT integration.

To summarise the classroom issue, projector equipped classrooms are ideal for lectures but at the expense of individualised learning. On the other hand, computer laboratories provide individualisation and connectivity but limit interactivity in the classroom as stated by Meurant (2010). These traits pointed to the necessity to design a language t-MALL environment combining the flexibility of sitting arrangements of conventional classrooms with the technological advantages of computer laboratories in congruence with recommendations from Enriquez (2010). The current research sought to explore how integrating tablet computers in the foreign language classroom could bridge the benefits of both classrooms and computer laboratories in developing the students' engagement with learner centred, active task-based learning and learner-controlled approaches.

Technologically, tablet computers conveniently stand in between netbooks and smartphones and are marketed in a similar price range. These devices are sleek as well as light weighting about 500 g which makes them relatively easy to carry around. Their sizes are comparable to notepads, items which are commonly found in the students' bags. Their screen sizes, ranging from 7 inches to 10 inches enables comfortable reading, browsing and note taking. In addition, their power autonomy is close to 10 hours which allows for an intensive use of all the applications and media available. Furthermore, tablet computers come in a variety of sizes and storage capacities to accommodate most individuals' needs and budget.

Tablet computers have been found to counteract the rigidity of classroom arrangement by Alvarez et al. (2011) as well as to foster engagement through just-in-time learning. Light, compact and user friendly, tablet computers also feature all the necessary tools for effective foreign language teaching as reported by Godwin-Jones (2012) such as digital library, audio and video players, and multiple languages dictionaries and predictive text input functionality. The 3G models allow for a permanent Internet connection for instant access to online based resources as well as online accounts allowing for cloud computing. At the onset of the present research, the literature suggested that touch-input tablet computers brought an interesting alternative because they catered for both individualised and collaborative learning needs as noted by Melhuish and Falloon (2010). Furthermore, Girard et al. (2013) found that tablet computers allowed for a greater mobility and flexibility in classroom arrangements.

In the research site, the learning progression and the learning outcomes are set in the course synopsis. Therefore, the students in this research were situated within the same proficiency bandwidth. However, their level of expertise varied regarding the development of their pragmatic skills as well as in their individual mastery of the four language skills. Consequently, in order to complete a task, each learner relied on a customised access to support material and studying configurations based on their strategies, learning preferences and identified needs. Consequently, a learner-centred scaffolding approach was expected to provide each student with a learning support and environment matching his or her ZPD. Scaffolding in this study related to the support framework available in the foreign language classroom learning environment. Social constructivists define scaffolding as including instructor's facilitation as well as peer support, tutorial and collaboration (Hickey, 1997). Meanwhile, MALL research emphasised the emergence of mobile technologies as a third support channel (Mifsud & Mørch, 2010). These benefits in terms of support and learners' engagement were confirmed in previous mobile learning implementations in the research site. However, as mentioned previously, the technological set-up needed to be adapted to the foreign language classroom context in order to increase the learners' engagement in synchronous interactions in face-to-face settings. Subsequently, the present research aimed to explore the potentials of tablet computers in enhancing the classroom learning environment by adding a flexible and effective technological support. The t-MALL classroom environment was expected to promote the learners' engagement during contact hours by catering to the learners' needs for just-in-time access to resources during spontaneous interactions. Thus, the learning environment was created based on the precepts from educational psychology theories so as to include the three motivational elements, related to classroom engagement through increased motivation. First, the

learner-centred approach aimed to foster a caring environment. Second, the task-based approach was expected to bring meaningful experiences to the learners. Third, the learner-controlled approach targeted a supportive environment.

## **CRITICAL REVIEW OF THE LITERATURE**

In the designing phase, this study first attempted to evaluate the current knowledge on learning a foreign language at the tertiary level with tablet computers. In order to assess past research on this topic, a critical review of the literature has been conducted. This section first describes the purpose of the critical review, and then enumerates the exclusion criteria that were used. Subsequently, the inclusion variables which were used to categorise the literature are described, before reporting on the findings of the review leading to the knowledge gaps. This section concludes with accounts from relevant past research which enlighten the research topic.

A critical review was conducted to constitute an overview of past research on the implementation of foreign language learning with tablet computers in tertiary education as illustrated in Table 1. The purpose of the review was to understand the circumstances leading to the integration of tablet computers in various contexts and to list the benefits and drawbacks encountered by previous researchers. Due to the novelty of tablet computers and a dearth of literature, it was anticipated that studies which validated instruments and frameworks, and which could be readily adapted to the research site would be scarce. Nonetheless, findings from past studies were listed and categorised based on the research questions in order to serve as design guidelines for the implementation framework.

### **Exclusion Criteria**

To conduct a critical review of studies on learning a foreign language with tablet computers, 157 articles were collected from three online databases: Google Scholar, EBSCO host and ERIC using keywords relevant to the present study. Subsequently, several excluding criteria were applied in order to produce a critical review. First, all articles published in conference proceedings were rejected from this analysis. This criterion was set to obtain only articles which underwent an explicit peer review process. Although applying this criterion excluded a vast number of articles which reported on initial findings, it was decided that ensuring the quality of the selected publication should prevail. Second, to further validate the review, only articles published in refereed journals indexed in the Scopus or ISI databases were included as the methodical peer review process for these publications ensured the comprehensiveness, meticulousness, reliability and validity of the research report. Third, all articles which did not report on an explicit method of data collection were discarded. Articles which reported on other research or only offered recommendation were rejected. Although articles which provided general recommendations for integrating tablet computers were relevant to the present study, these were not included as their findings were not grounded in usable data from actual research. Furthermore, the articles which were not directly relevant to the research objectives were discarded from the critical review such as general CALL and MALL research as their focus was too broad to contribute new knowledge on the affordances of tablet computers.

### **Inclusion Variables**

Two inclusion criteria were applied to this critical review. First, all articles needed to report on studies conducted in educational settings. As such, these included reports on research conducted at the primary, secondary or tertiary level. Second, only articles which dealt with the use of tablet computers were included in order to specifically identify the benefits and issues related to implementing these devices in education. The reasons for discarding reports which focused on CALL as well as MALL with handheld mobile devices such as MP3 players and smartphones were twofold. At the onset of this study, tablet computers were still relatively novel. As such, tablet computers were categorised as non-transparent technologies when using the definition provided by Cox and Graham (2009). Also, as stated by Churchill et al. (2012), the specifications of handheld mobile devices such as MP3 players and smartphones differed from tablet computers which prevented such reports to be used as a research framework for replication. Even though these reports were not included in the critical review section, concepts from CALL and MALL studies applicable to the objectives of the t-MALL implementation were used to guide the current research. These concepts were reported based on their relevance with the objectives of this study in the subsequent sections of this article.

Several inclusion variables in this critical review were significant to the present study. The first variable related to the field of study described in the articles. Since the focus of the present study was on foreign language learning, articles which dealt with the same field were highlighted. Although the current study was conducted at the tertiary level, it was believed that experiences which took place in primary and secondary

institutions could be of significance as findings, challenges and methods used might be related. The countries where the studies were conducted were also included as this variable would have some impact on the cultural and pedagogical background of the learners.

Findings which reported on technological content knowledge and pedagogical content knowledge were also identified. Tablet computer implementations may be directed at learners, teachers or both. Therefore, the inclusion of this variable provided a clear perspective on the recipient of the interventions. The specific type of tablet computers used was included as specific technological features might have some effect on the type of pedagogical interventions that were put in place. Furthermore, the implementation variable stated whether the users used their personal tablets or tablets on loan as both types of users might experience events differently. Moreover, the fashion in which these mobile devices were distributed was noted as a tablet provided on loan for a short duration did not yield the users with the same experience as one which was lent for a significant period of time. Whenever the number of participants in the studies was mentioned, these numbers were recorded as they provided information on the size of the sample and thus on the significance of the study. Finally the methods used were described in the analytical table as they informed the researcher on the type of data that was collected and thus revealed the orientation of each study.

### **Knowledge Gaps**

The critical review revealed two knowledge gaps, a geographical gap as well as a methodological gap regarding the literature about tablet computers in educational settings. The first knowledge gap pertained to foreign language learning with tablet computers while the second knowledge gap concerned foreign language learning with tablet computers at the tertiary level. The critical review showed that only two articles matched these two inclusion criteria. Harris et al. (2009) stipulated that in accordance with the Technological pedagogical content knowledge (TPACK), the appropriateness of a new technological set-up involved considering the context, the subject taught and the device specificities from the planning to the implementation phase. However, the critical review revealed that 63 per cent of studies were conducted in institutions of higher learning irrespective of the subject taught. Although the critical review of the literature showed that 42 per cent of articles dealt with language learning, the majority (75%) of these studies were not conducted at the tertiary level which illustrated a need for additional research in post-secondary settings with young adults. Furthermore, foreign language learning studies accounted for only 16 per cent of the publications retained for this review. Moreover, the classification by country in the critical review highlighted a geographical gap. As can be viewed in Table 1, the geographical distribution of these reports highlighted a marked disparity. For the most part, studies were conducted in Northern America (47%), followed by Australia (21%), Asia (16%), Europe (10%), and Southern America (5%). In addition, no single report on studies conducted in Malaysia matched the inclusion criteria of the critical review. Likewise, in their review of the TPACK literature, Chai et al. (2013) highlighted a profound knowledge gap pertaining to studies investigating technological integrations in language learning at the tertiary level from the perceptive of Asian undergraduates.

Table 1. Results for Foreign Language learning with tablet computers in tertiary education

Authors	Year	Journal	LL	Ter.	Country	TCK	PCK	L	T	Device	Implementation	N.	Method
1 Chen	2013	Language Learning & Technology	FLL	✓	China	✓	✓	✓	✓	Teclast P5 Android	Loaned	10	Action research
2 Lys	2013	Language Learning & Technology	FLL	✓	United States	✓	✓	✓	✓	iPad	Loaned 9 weeks	13	Questionnaire, artefacts, tests
3 Lan et al.	2007	Language Learning & Technology	FLL		Taiwan	✓	✓	✓	✓	Tablet PC	Unknown 10 weeks	26	Quasi experimental observations
4 Lynch & Redpath	2012	Journal of Early Childhood Literacy	LL		Australia	✓	✓	✓	✓	iPad	Shared in-class 16 months	24	Ethnographic, observation, interviews
5 Li et al.	2010	Education and Information Technologies	LL		China	✓	✓	✓	✓	Tablet PC	Owned		Case study, observations, interviews
6 McClanahan et al.	2012	TechTrends	LL		United States	✓	✓	✓	✓	iPad	Loaned 5 weeks	1	Action research, participatory
7 Hutchison et al.	2012	The Reading Teacher	LL		United States	✓	✓	✓	✓	iPad	In-class 3 weeks	23	Exploratory, observations and interviews
8 Yang & Xie	2013	Language Learning & Technology	SLL	✓	United States	✓	✓	✓	✓	iPad	Loaned 8 weeks		Action research, questionnaire, artefacts
9 Pegrum et al.	2013	Australasian Journal of Educational Technology		✓	Australia	✓	✓	✓	✓	iPad	Loaned 1 semester	8	Case studies, interviews, observation
10 Manuquera & Petocz	2011	Asian Social Science		✓	Australia	✓	✓	✓	✓	iPad	Loaned 15 months		Survey

Note. LL = Language learning; Ter. = Tertiary education; TCK = Technological content knowledge; PCK = Pedagogical content knowledge; L = Learners; T = Teachers.

(continued)

Table 1. Results for Foreign Language learning with tablet computers in tertiary education (continued)

Authors	Year	Journal	LL	Ter.	Country	TCK	PCK	L	T	Device	Implementation	N.	Method
11 Kinash et al.	2012	Australasian Journal of Educational Technology		✓	Australia	✓		✓		iPad	Loaned 2 weeks		Mixed method, survey, focus group
12 Mang & Wardley	2012	Journal of Information Technology		✓	Canada	✓	✓	✓		iPad	Loaned 6 weeks	49	Observations
13 Alvarez et al.	2011	Computers in Human Behavior		✓	Chile	✓	✓	✓		C-CMPC	Loaned 12 sessions	20	Mixed methods, survey, observations,
14 Culén & Gasparini	2012	PsychNology Journal		✓	Norway	✓		✓		iPad	Loaned 1 semester		Case studies, observations, interviews
15 Morgan & Toledo	2006	Journal of Interactive Online Learning		✓	United States	✓			✓	Tablet PC	Loaned		Survey, Likert and open ended
16 Steinweg et al.	2010	TechTrends		✓	United States	✓	✓		✓	Tablet PC	In-class		Unspecified, review of potentials
17 Enriquez	2012	College Teaching		✓	United States	✓	✓	✓	✓	Tablet PC	In-class 16 weeks	20	Case studies, quasi experimental
18 Ifenthaler & Schweinbenz	2013	Computers in Human Behavior		✓	Germany	✓			✓	Tablet PC	In class	18	Qualitative, interviews
19 Murray & Olcese	2011	TechTrends		✓	United States	✓	✓			iPad	Unknown 3 months	3	Critical review, review of applications

Note. LL = Language learning; Ter. = Tertiary education; TCK = Technological content knowledge; PCK = Pedagogical content knowledge; L = Learners; T = Teachers.

Furthermore, technological content knowledge was reported in all studies, however pedagogical content knowledge accounted for 74 per cent of these studies. A minority of articles (26%) related research dealing exclusively with the use of tablet computers with learners; 21 per cent dealt exclusively with teachers, whereas 47 per cent dealt with both learners and teachers. Two devices accounted for the majority of tablet computers used in these studies: iPads which were present in 58 per cent of articles and generic tablet PCs which were used in 32 per cent of the reports. In most studies (58%), the tablet computer was loaned to the students by the instructor or the institution. Finally, the critical review revealed a methodological gap in terms of participants' exposure and experience with the technological set-up. The longest recorded period of investigation was 16 months, although more than two third of studies reported a duration which did not exceed one semester. Ferreira et al. (2013) recommended investigating the usefulness of m-learning in higher-education over a long term investigation in order to explore the full spectrum of reasons leading to the adoption or rejection of the technology in education. Similarly, in their review of the m-learning literature, Koszalka and Ntloedibe-Kuswani stressed the necessity to explore the students' involvement with mobile technologies on a long term basis in order to investigate the "environmental, personal, and content factors that are most important in m-learning" (2010, p. 152). For these reasons, the current study sought to fill these knowledge gaps by conducting a grounded action research lasting two years with one single cohort of Malaysian undergraduates on the usage of tablet computers for foreign language learning.

## DESIGNING THE ACTION PLAN

### MALL Concepts from the Critical Review

The critical review revealed two articles as predominantly relevant contextually and conceptually to the current study. Chen (2013) investigated how tablet computers could enhance the autonomous skills of undergraduates majoring in English as a foreign language in a Chinese university. A brief summary of her research is included hereafter as her article concisely reflects the objectives, theoretical choices, benefits, drawbacks and limitations observed in the 157 articles reviewed. The second major contribution reported findings from Lys' (2013) implementation of tablet computers in German as a foreign language advance proficiency courses in the United States.

Chen's (2013) purpose consisted in analysing the affordances which tablet computers could bring for outside-class learning. She conducted an action research with ten participants who received an Android-operated tablet computer on loan. The research was divided in two cycles and was carried-out over three weeks. In the first cycle, the learners were requested to write daily reports describing how they had used the tablets to learn English and to report the benefits as well as the issues they had met. After one week, interviews were conducted to further gain understanding about the learners' perceived usefulness and ease-of-use of the tablet computers to learn English. The first data collection revealed that the learners had used the tablets for reading e-books, playing games and watching films. Overall, the learners were satisfied with the affordances pertaining to language learning however, they complained that the unreliable Wi-Fi access made the tablets useless. They also stated that they were confused by the extensive choice of applications. Some learners were concerned about the distractions which they found hard to resist and feared for their grades. Chen's answer was to promote interactive and meaningful learning. She experimented online collaborative learning with micro-projects on learning English with tablets. The projects were focused on how tablet computers could assist learners in performing language skills. The learners discussed with audio and text chats and posted their project on a micro-blogging site. Findings revealed an increase satisfaction with learning with tablets because the tasks were collaborative. The fact that the projects were meant to help learners of English motivated the learners who became engaged in the target language. The rationales provided for the tasks and their reflexive nature contributed to guide the learners toward autonomy. Chen concluded on the necessity to combine the technological implementation with pedagogical tasks designed for tablets to sustain the learners' participation. Furthermore, findings highlighted the need to provide some support to assist learners with technological aspects in line with the TAM's construct of facilitation conditions (2003). Limitations to the research were the insufficient support structure and the short timeframe for the study. Sadly, financial resources prevented Chen from implementing her third cycle with an improved supportive environment.

Lys' (2013) study aimed to improve the oral proficiency level of advanced foreign language learners either majoring or minoring in German as a foreign language in the United States. Her purpose was to engage her students so as to increase their speaking opportunities. Similarly with Chen (2013), she looked into ways to immerse her students in the target language and culture by implementing blended learning. Her research was carried-out over nine weeks with 13 participants who received an iPad on loan. She used a pre-test and a post-test to measure the learners' speaking progress and analysed the video and audio recordings produced

by the learners. She implemented a task-based approach. The scaffolding followed the precepts of social constructivism and self-regulated learning while the activities were designed according to interactive and meaningful learning approaches. The learners used the iPads to download and play audio-visual material from TV channels. From the multimedia documents the learners produced audio recordings where they summarised the content from the news' programs. The video recordings consisted of videoconferencing and chat sessions among classmates on daily topics. Similarly with Chen (2013), Lys asked the learners to share their work on a private social network. The learners were asked to evaluate their learning experience with the tablets and their progress in face-to-face or in chat discussion groups. Unfortunately, the students could not recall the events and the data collected was not pertinent. The self-evaluating forms revealed that seven learners reported having progressed which concurred with Lys' analysis of their assignments. In terms of proficiency, Lys confirmed that an increase in exposure and opportunities to speak improved the learners' oral proficiency. Watching the news also heightened their interests about the German culture. Results from the survey confirmed the usefulness and attractiveness of searching and viewing multimedia content on the iPads. However, the learners found the iPad perplexing to master particularly the videoconferencing, recording and editing applications as well as syncing the iPad.

Chen (2013) placed a greater emphasis on the technological affordances while Lys (2013) remained focused on the effects of the pedagogical approaches. These articles showed a balanced reporting between the two aspects of educational technology. However, the critical review of the 157 articles revealed a tendency for researchers to emphasize either the educational implementation or the technological integration but seldom both aspects. Chen's (2013) and Lys's (2013) objectives of enhancing their students' engagement and autonomy with tablet computers were observed in most publications. As a mobile device, tablet computers enabled ubiquitous learning affordances, a concept associated with self-regulated learning as well as flexible and blended learning. The learning approaches adopted in most publications were derived from social constructivism. The pedagogical approach in most articles involving tablet computers consisted of student-centred learning, peer learning, meaningful learning as well as interactive learning as in Mango (2015). Most studies used task-based approaches which also reflected the integration of mobile devices to social networking trends in line with MALL literature as illustrated by Cochrane (2014) and by Dias et al. (2014). The technological reasons advocated for choosing tablet computers were their features which were associated with the powerful computing power of laptops, the mobility factors of smartphones and multimedia capacities of MP3 players.

Similarly with Lys's (2013) and Chen's (2013) studies, most research implementing MALL with tablet computers sought to increase the learners' exposure and motivation to interact in the target language. However, in these studies most tasks were introduced in physically blended learning environments with distinct out-of-class and in-class phases. In the current study, the t-MALL environment aimed to unite both physical and virtual dimensions in a ubiquitous blended learning environment also referred to as immersive by Koszalka (2010) and by Kukulska-Hulme (2012). The physical dimension comprised face-to-face instructor and peer scaffolding as well as technological scaffolding. The technological support comprised online and offline references and tools such as textbooks and mobile applications. Additionally, the online dimension incorporated access to Web-based resources and tools as well as online peer and instructor scaffoldings through the courses' private Facebook groups learning space.

### **Technological Literacies**

In the current research, the concept of technological literacies referred to the factors influencing the learners' acceptance of mobile learning as well as the learners' digital literacies regarding t-MALL. The learners' profiles pertaining to their digital literacies and readiness were defined based on findings from Diemer et al. (2013) as well as from Kukulska-Hulme (2013). In addition, the researcher explored the internal and external factors shaping the learners' beliefs about mobile technologies. The internal factors were investigated with the concepts of perceived ease-of-use as well as perceived usefulness from Venkatesh et al. (2003) as well as from the concepts of perceived mobility and perceived enjoyment from Huang et al. (2007). The external factors consisted of the role of social influences and facilitating conditions in shaping the students' willingness to use the tablet computers as highlighted by Lee (2010).

Furthermore, the investigation of the student's technological literacies ensured the fitness of the concepts extracted from the critical review of the literature regarding the relevance of t-MALL to the site's specificities and needs. The inclusion of both internal and external aspects contributed to refine the t-MALL framework in order to foster the learners' engagement. The descriptors from Chai et al. (2013) TPACK model sought to triangulate the preliminary concepts resulting from previous research conducted on the site analysed by Gabarre et al. (2014) and contributed to the validity of the resulting t-MALL pedagogical

framework for foreign language learning with tablet computers with Malaysian undergraduates.

### **Scaffolding Framework**

In accordance with social constructivist theory, the language tasks incorporated a knowledge gap in order to prompt peer learning and to stimulate self-regulated learning under the guidance of the instructor as recommended by Nunan (1992) and by Simina and Hamel (2005). The combination of technological, peer and instructor support in a t-MALL environment were found beneficial in the learners' development of language competencies, students' engagement as well as learning skills and digital literacies by Chen (2013) and by Lys (2013). The triadic scaffolding framework was conceived based on the classroom motivational development model from Skinner and Pitzer (2012, p. 29). Thus, the scaffolding framework aimed to enhance the students' sense of belonging to the learning community as well as their self-esteem and self-efficacy. Therefore, technology, peers and instructor support were conceived as motivational facilitators of engagement.

## **CONCLUSION**

The critical review revealed a knowledge gap in the field of learning foreign languages with tablet computers in tertiary education. Therefore, the communicative task-based pedagogy designed for the t-MALL classroom associated meaningful, learner-centred and learner-controlled approaches within a triadic scaffolding framework involving technological, peer and instructor support. In line with the notion of zone of proximal development, the t-MALL implementation was constantly monitored in order to ensure the appropriateness of the tasks with the students' proficiencies and literacies. As such, the descriptors from the Pedagogical technological content knowledge (TPACK) framework were used to evaluate the fitness of the t-MALL implementation in the research site from the instructor's and the students' perspectives. In addition, the students' perceptions towards the ease-of-use and usefulness of learning with tablet computers were monitored with the Technological acceptance model (TAM) for mobile learning.

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