MLEARNING SCAFFOLDING MODEL FOR UNDERGRADUATE ENGLISH LANGUAGE LEARNING: BRIDGING FORMAL AND INFORMAL LEARNING

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ABSTRACT
Learning using mobile devices also known as mLearning is the current buzz word in the present debates over the use of technology in education. Although mLearning has a high prospect for future education, it is yet to be incorporated widely in mainstream formal education. The lack of a contemporary theory of learning and model for the mobile era has been one of the main issues hindering the incorporation. Although past studies have discussed learning theories and models for mLearning at great length, there is a wide gap in the investigation of theory and model for language-learning in the mobile context. Hence, this paper aims to describe how learners could be assisted in language-learning via supportive scaffolding using mobile devices at the undergraduate level using Gilly Salmon's five-stage scaffolding model. This model is supported by Vygotsky's Zone of Proximal Development as the basis of learning theory. A case study was conducted on undergraduate language-learning in a private university in an attempt to seek how this model could be applied for mLearning. The results from the study revealed improvement in learners' language performance but more importantly the results also suggested some adaptations to be made to the model in order to adapt it to language-learning in the mobile context. As mLearning should include informal learning, the key characteristic of the adapted model shows how formal learning and informal learning can be interwoven using mLearning.
Keywords: mLearning, Scaffolding, Zone of Proximal Development(ZPD), Scaffolding model

INTRODUCTION

The learning society has been transformed from 'wired society' to become 'mobile society' with the advent of wireless technology. The design of learning across the mobile contexts, especially for mainstream education need to be guided by theory in defining the education practice across this context and also because of the ability of theory in defining research agenda and producing predictions and generalizations (Traxler, 2009). Although past studies have discussed learning theories and models for mobile learning (mLearning) at great length (Collins & Thomas, 2010), there is a wide gap in the investigation of a specific mLearning theory or model for the learning of a particular knowledge field or skill such as language-learning, considering that learners use different learning approaches for different knowledge subjects or skills.

MLearning models from past studies mainly focus upon mLearning infrastructure and access system (Kinshuk & Lin, 2004), tutoring system (Bull & McEvoy, 2003; Kazi, 2005) or mLearning adoption and policy (Barker, Krull & Mallinson, 2005). However, these models are techno centric in nature, which are useful within the context of how mLearning could be delivered technically. Although studies on the aspects of pedagogical learning model exist such as by Brown (2005) or Shih & Mills (2007), the learning models describe mLearning process for learning in general for any areas of knowledge, course or skill. Though Chen & Hsu (2008) presents an mLearning model for English Language-learning, the model actually focusing on a personalized tutoring system in support of language-learning rather than the learners' learning process of language skills. Hence, the focus of this paper is to propose a pedagogical mLearning model for language-learning, which describes how the learning process of the learner is mediated through mLearning. The model focuses on the learner's learning which foregrounds technology support (technical system, infrastructure, technology or mobile devices), but at the same time not to discredit the role of technology. However, the model at the same time should be able to address the learning and teaching problems as this ability would result in effective instruction (Isman, 2005). Thus, we adopted Gilly Salmon's Five-stage model to describe undergraduate language-learning, capitalizing on

interaction as the medium of learning. The key characteristic of the model shows how formal learning and informal learning can be interwoven using mLearning in view of incorporation of mLearning in mainstream education. This is important because mLearning is also about creating a seamless space in bridging formal and informal learning (So, Kim, & Looi, 2008). In justifying the use of the model, section 2 of this paper elaborates on interaction as the essential component in learners' language-learning via mLearning. We support the adoption of Gilly Salmon's Five Stage model with past existing learning theory such as Vygotsky's Theory of Zone of Proximal Development (ZPD), bridged by 'scaffolding' as the central theme of learning.

In the literature, there is a lengthy discussion on how mLearning should be theorized, but the discussions are mainly centered on theories describing mLearning in general (Keskin & Metcalf, 2011; Naismith, Lonsdale, Vavoula, & Sharples, 2004) leaving a large gap in mLearning theories for a specific field of knowledge or course subject. Thus, in this paper, we propose to adopt Vygostsky's ZPD to view how students generally learn via mLearning through interaction. Based on this theory, through interaction, the notion of scaffolding is introduced to describe how learners were aided in achieving their language-learning goals. Since studies focusing on scaffolding learning in classroom setting is scarce (Kim & Hannafin, 2011), this study would help in filling the gap exclusively with the incorporation of mLearning in undergraduate language classroom via scaffolding. Hence, in section 3, we employ Gilly Salmon's Five Stage scaffolding model to describe the process involved in assisting learners to reach their learning aims. In investigating further the relevancy and effectiveness of this model in the learning process, we conducted a case study as elaborated in section 4. Section 4.1 describes the results and discussion of the case study which reveals the effectiveness of the model for mLearning but more importantly on the adaptations needed to be amended on the model. The paper ends with the conclusion in section 5, which discusses the contribution and implication of the model in language-learning via mLearning in future education besides proposing further recommendations for the study.

THEORETICAL FRAMEWORK : VYGOTSKY'S THEORY OF ZONE OF PROXIMAL DEVELOPMENT (ZPD)

ZPD is one of the three major themes in Vygotsky's Social Development Theory (1978). According to Social Development Theory, Vygotsky envisages that social interaction precedes development where consciousness and cognition is the end product of socialization and social behavior. Vygostky defines the ZPD as "The distance between the actual developmental level as determined by individual problem-solving and the level of potential development as determined through problem- solving under adult guidance or in collaboration with more capable peers" (Vygostky, 1978:86). In other words, referring to Figure. 1, ZPD is the distance between the most difficult task someone can do alone and the most difficult task someone can do with help (Vygotsky in Mooney, 2000:83).

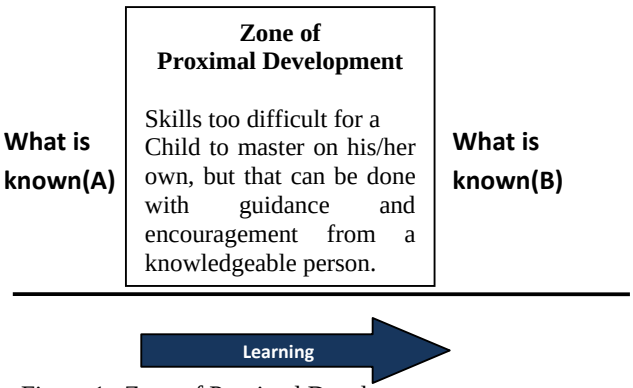

Figure 1. Zone of Proximal Development

In his theory, Vygotsky stresses that interaction is vital for a learner in the edge of learning where the learner can benefit from the interaction to enhance his or her learning achievement. He stresses that interaction between the learner and other more skilful peers could effectively aid in developing the learner's skills and strategies. In the context of this study, lecturers may include cooperative language activities where skilful peers could help less competent language learners within the learners' zone of proximal development. Now, these more skilful peers are what Vygotsky terms as the More Knowledgeable Other (MKO). MKO is an important concept that relates to the difference between what a student can achieve on his own and what the student can achieve with the guidance and encouragement from a more skilled partner. This concept implies that not necessarily higher

interlocutors such as lecturers or instructors but other students qualify to be the MKO too. The assistance given by the more skilled learners here is what is also termed as 'scaffolding'. However, Vygotsky never used the term scaffolding in his theory, but the term was first introduced by Wood, Bruner, & Ross (1976)(cited in Tharp & Gallimor, 1988) as a metaphor to idealize the role of a teacher. Vygotsky suggests that when a student is at the ZPD, he should receive the appropriate assistance (scaffolding) by an MKO just enough to achieve the task. Once this student gain mastery of the task, the 'scaffolding' may be removed, and he would be able to face the task on his own again. This is likened to scaffolding as a metaphor taken from building construction where the scaffolds are use to support workers to construct a building, and the scaffolds will be removed after the building is completed (Johnson, Christie, & Wardle, 2005). However, in education, this metaphor is argued as more suitable for a "well-defined end" and is teacher-centered (Duffy & Cunningham, 1996, p.183). This type of scaffolding is known as 'Directive' scaffolding where students are expected to acquire standard skills and knowledge taught through series of specified content and strategies designed by an instructor. Conversely, in practice, scaffolding should be a learner-centered strategy where learning ends are determined by the learners' needs. This type of scaffolding, better known as 'Supportive' scaffolding, which manifests in instructions tailored to students needs based on their own ability and interest (Lenski & Nierstheimer, 2002). In scaffolding, the ZPD actually serves as a critical concept.

ZPD concept was originally applied in face-to-face tutoring but later it was found to be also successful in other settings where computer software could serve as scaffolding support. For example, a software design framework, the Learner Centered Design (LCD) was developed based on scaffolding as main support for learners (Soloway, Jackson, Klein, Quintana, Reed, Spitulnik, Stratford, Studer, Eng, & Scala, 1996; Wood, Bruner, & Ross, 1976) and also the ECOLAB (Luckin, 1999), a tutoring system developed based on the Vygotskian design framework which provides interactive environments to assist children aged 10-11 years to learn about food chains and webs. ECOLAB is found effective in assisting the children through providing appropriate challenging activities. The learner model is also able to track the learners' individual capability and potential in order to provide the right amount of collaborative assistance during the activities. In this way, ECOLAB not only assists learners in reaching beyond what they could not achieve alone through the activities but also explicitly direct them through the activities with success. Other examples like QUADRARIC (Wood, H. & Wood, D., 1999) offers assistance when needed by the learners where a tutor would continually monitor their activities logged into the system in order to response when help is needed and also to determine the type of help whereas DATA (Wood, H., Wood, D., & Marson, 1998) would offer online assessments to learners and offer tutoring to them based on evidence of errors made. One of the most recent studies was one conducted by Zhang & Quintana (2012) who design the Digital IdeaKeeper, a scaffolding software tool to assist students with online inquiry. The software tool resulted in students' online activity to be more systematic, integrated, efficient, continuous, and focused. Furthermore, the online environment which facilitates the students' activity allows them to participate and manage their own learning (Isman, 2004). All these tutoring systems capitalize on scaffolding the learners to reach their projected learning outcomes where assistances are offered based on the learners' individual needs, level and pace within their ZPDs.

In all the examples given above, the MKO plays a significant role in providing the scaffolding for the learners to deal with their ZPD and the MKOs are usually a more capable peer, a tutor, or a lecturer. However the MKO may not necessarily be in human form. As an example of this, John Cook (2010) presents an augmented context for development mediated by mobile phones in reconceptualizing Vygotsky's notion of ZPD. He argues that the context of learning for the century is augmented and accelerated by mobile devices and technologies through new digital tools and media. This actually supports augmentation as a fundamental way in conceptualizing mLearning (Metcalf, 2006 in Quinn, 2011; Quinn, 2011).

As Vygotsky's Theory of ZPD postulates learning on social interactions in facilitating learners' learning and cognitive development, the theory supports mLearning as mLearning also thrives on interaction and communication among individuals for learning too. Interestingly, if taken in the opposite perspective, mLearning could in turn support this learning theory. For example, one of the criticisms of ZPD is that it is impossible for a teacher or an instructor to attend to all his students' ZPD in the classroom due to factors like time constraint and large class size. To add to the odds, different students would have distinct ZPD and time taken to attend to each of the ZPD depends on the students as each of them would have a different learning pace. However, through mLearning, via mobile technologies and devices, there is a larger repertoire of communication channels which the students could resort to seek help from more 'experts'(MKO) other than their teachers or instructors to interact with in order to meet their learning needs at their own pace in or beyond the classroom walls detached from time constraint.

In the scope of this study, Vygotsly's ZPD was employed to theorize mLearning which capitalized on interaction where scaffolding serves to aid learners to achieve their learning goals as discussed in this subsection.

CONCEPTUAL FRAMEWORK: THE ADAPTATION OF GILLY SALMON'S FIVE-STAGE SCAFFOLDING MODEL

However, the main issue underlying Vygotsky's ZPD theory is how learners could actually be aided through scaffolding in overcoming their ZPD to reach the next level of knowledge or skills from point A to point B as shown in Figure 1. In other words, what would be the learning process or stages that the learners should go through before they reach their learning target? Thus, we propose Gilly Salmon's Five-Stage Scaffolding model to be adapted to conceptualize how learners could be aided using mLearning to overcome their ZPD. This forms the conceptual framework of the study as shown in Figure 2.

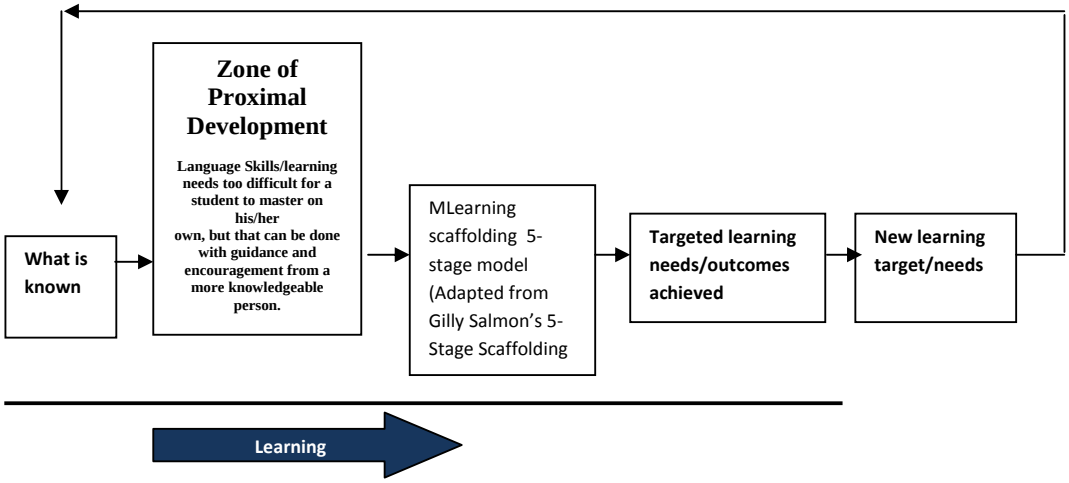

Figure 2. Scaffolding MLearning Conceptual Framework

The Gilly Salmon Five-stage model as shown in Figure 3 is chosen based on four reasons. First, although the model was originally developed for eLearning, it supports social learning theory which capitalized on meaningful interaction based on Salmon's key premise. The premise holds that the learners' ability to learn online goes beyond the boundaries of technical aspects, encompasses an underpinning social learning principles, where every individual surrounding the learner plays an important role in learning through his or her relationship with them under the support and guidance of a moderator. This aligned with the theory of mLearning as discussed in this paper which saddles on interaction as medium of learning. Second, similar to Salmon's key premise on eLearning, mLearning concept should not be techno centric or conceptualized in terms of technology or devices, rather learning should be perceived as a result of interactions among learners, teachers, mobile devices, knowledge, and the learning context (Abdullah & Saedah, 2010). Third, Salmon's model links to the theory discussed earlier as it could also be regarded as an extension of Vygotsky's ZPD (Attwell, 2006). According to the model structure, the moderator gradually shifts the responsibility of learners' development to the learning community guidance while the learner eventually takes charge on his learning by developing own scaffolding through relationship with other members of the community an as well beyond the community.

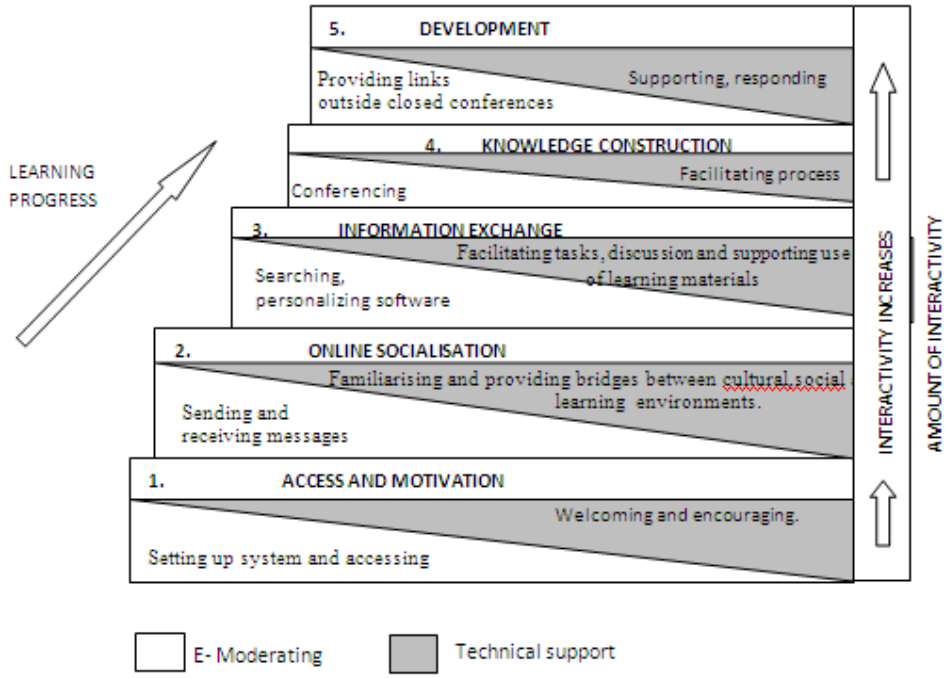

Figure 3. Gilly Salmon's five-stage model (Salmon 2004).

Another crucial reason why this model is chosen is that as mLearning should include informal learning, the key characteristic of the model shows how formal learning and informal learning can be interwoven in a mobile context in aiding learners to reach their learning goals (Abdullah & Saedah, 2011) . Briefly, about the model; in Stage 1, the aim is to encourage and guide students to participate in the online conference. Technical support is given to the students as the main focus task of the instructor. Stage 1 ends with students' first posting of message. Stage 2 aims to get students to establish their identities and initiate interaction and familiarize with it. Stage 3 is where interaction heightens with the use of learning management software for networkings. In Stage 4, participants develop group discussions and collaboration among themselves in negotiation of knowledge and solutions to individual needs of learning. Finally, Stage 5 promotes individual reflection of what they have learned and achieved as well as critical thinking to advance to next learning goals. In investigating how this e-learning based model could settle in language-learning through mLearning, the paper describes a small-scale case study using the model in an undergraduate English Language course as described in the following section.

THE CASE STUDY: ADAPTING GILLY SALMON'S FIVE STAGE MODEL FOR MLEARNING UNDERGRADUATE LANGUAGE LEARNING

The main aim of the study is to investigate how this model could suit mLearning and deduce from the results what changes could be identified if any, by comparing activities done by students with activities in the model. The model was used on 'Professional Communication Skills (PCS)' course, an undergraduate English Language course in a private university. It is a compulsory subject to be taken in fulfillment of a four year undergraduate study among engineering students. This course emphasizes the theory and practice of professional communication at the interpersonal level, in teams and to a large group. The course serves to build upon the students' academic and professional knowledge acquired through other core engineering or technical courses and aim to enable them to be highly effective in expressing themselves and in imparting their professional and technological expertise in a variety of jobs, business and professional settings. The whole course was designed to last fourteen weeks for each semester and divided into four parts: Process Description (Group Poster presentation), Technical Oral Presentation (Individual presentation), Business Meeting (Group presentation) and Persuasive Oral Presentation (Individual presentation). The course has been conducted in formal classroom settings complemented with eLearning. However, the eLearning facility was largely used by students to access notes and powerpoint slides for course content uploaded by lecturers and for administrative announcements. Since the course was still conducted in traditional face-to-face classroom setting, students were strictly required to adhere to the minimum 80% physical class attendance. Due to this regulation, we were only given permission by the university to select one of the four parts during the course to conduct the study. We selected the Persuasive Oral Presentation component to facilitate the study. There were 25 participants (maximum number

allowed) in the course. The students were observed following their use on mobile devices in going through the presentation component for 48 days (remaining time for the semester allotted for the course component).

In a conventional classroom, for the Persuasive Oral Presentation component, students will be given some lectures on guidelines on the effective persuasive speech aided by examples of authentic samples of effective and non-effective presentation. There are opportunities given to students to have a mock trial on persuasive presentation before their evaluation but due to time constraint and affective factors (embarrassment, lack of confidence, etc.), there is usually room for the most two students to volunteer for the trial. Their presentation will be evaluated by the lecturer as a guide to other students but comments will be limited to students' individual presentation; in other words, the strength and weaknesses of the particular students may not be similar to other students who have not the opportunity to present. All these happened on the first week of lecture for the component. The subsequent week until the end of the time allotted for this persuasive presentation component will be for evaluation of students' presentation. All students were given one turn to present and receive their evaluation marks in the course. Students who get to present later will be more fortunate as they could learn from the strength and weaknesses of their friends' earlier presentation as a guide for other students to present better. In other words, students were largely not given the opportunity to improve on their presentation output in the conventional classroom.

For the mLearning version of the course, students will be briefed on the course design on the first day. The students were told that there were no physical classroom contact hours in the course (a great motivation for them to participate in mLearning) as they did not have to attend any classes. However, the students only have to attend classes for the last three consecutive days towards the end of the course for summative evaluation by their lecturer. However, learning would take place anytime or all the time wherever they were. We were the participant observers in this study. Students were divided into groups of five per group. Every student conveniently owned a smart phone. A standard mobile blog for the course using 'BlogmeNow' mobile apps was set up to be shared by everyone, including the lecturer. Students may post and respond to messages, upload and share notes and even videos of presentation. Students were encouraged to set up their group or inter group mobile blogs to interact, but they have to inform and share it with the lecturer for observation purposes. These individual blogs if set up would be for a particular scope of discussion shared through common interest among a particular group of students. The groups of students were given tasks similar to what is shown in Table 1 which were based on the five-stage model in Figure 3.

Table 1: *Sample mLearning Tasks Based on Gilly Salmon's Five-stage Model*

Stage and Duration	*Sample of Tasks*
Access and Motivation (3 Days)	Access the blog through BlogmeNow apps: PCS Persuasive Moblog by signing up creating own username and password. Lecturer initiate by posting the first message: 'Alright, welcome to PCS Persuasive Moblog. Maybe you could share with us how do you feel about going through this course using your phones?
Online Socialization (2 Days)	Make sure you have let others know your blog identity. You may discuss about the power point slide on Persuasive Presentation and evaluation guide attached to the blog by posting questions or suggestions on the blog. You may even discuss about your topic of presentation and elicit comments from other friends for suitability of the topic or improve on it.
Information Exchange (7 Days)	Study the evaluation form on what to expect from you in presenting an effective persuasive presentation. Discuss and post suggestions on how to meet the criteria. Focus on one criterion at a time. Suggestions may in a form on a sample video presentation obtained from YouTube or even a website link to resources.
Knowledge construction (30 days)	By now you should have chosen a topic for your presentation. Make a 7 minute video presentation, record it and post it on the blog. Elicit comments. You may also comment other students' work too compare the presentations. Identify common or shared problems or weaknesses which you want to rectify. You are encouraged to form a separate blog on your own with your friends and discuss the problem in detail. Remember to elicit help and comments from others. Who knows you may come out with new technique of your own in resolving the problem or weaknesses to improve on your presentation. Try it out to see how effective they are. Ask your friends to vote for effectiveness of your presentation after you have rectify the problems. You are strongly suggested to access 'urtak.com/' for quick survey result on your presentation.
Development (3 Days)	Have you found the best solutions to your problems? Are you satisfied with your achievement? Do you think the solutions were the best in the book or because it fits your presentation style? Share these experiences with your friends

This is to facilitate the observation and analysis of data to investigate what happened throughout the stages in mLearning in order to evaluate how the model fits in mLearning. The tasks shown are just samples to guide the student and their lecturer in the conduct of their learning in mobile environment. Students were told that they would be evaluated for participation in the blogs (ongoing assessment) and on their final presentation (summative assessment) at the end of the course. Students' participations in blogs were graded according to their level of engagement as described in Table 2. Data derived from this study were analyzed using content analysis and triangulated using responses from focus group interviews. In analyzing the content of messages, we concentrated on understanding the behavior of learners which occur naturally while interacting through the blogs. Blogs promote natural interaction because, students could assume anonymous identity and this allowas them the liberty to express their ideas and feelings without social threats. Ideas and expressions would be authentic and this facilitates reliable data in gauging any aspects of students' learning skills. For example, a recent study conducted by Norlidah, Saedah, Mohd Khairul, and Zaharah (2013) revealed that the use of social blogs such Facebook could enhance the creativity of Islamic Studies students in formal educational settings through their analysis on students conversation exchanges through the social sites. In this study, we used 'idea units' for analysis (Potter and Wetherell, 1989 in Salmon, 2000).

Table 2: *Participation in Blogs According to Level of Engagement*

Level	*Types of Engagement*	*Example of activities*
1	Observing and following	Observe and respond to blog messages either asking questions**,** or adding comments.
2	Contributing	Actively responding to blog messages, upload and share information on effective presentation or even post own presentation to elicit comments.
3	Owning	Form or participate in new blogs to discuss specific issues and problems shared commonly among them and seeking help either from peers or lecturers.
4	Leading	Take the initiative to seek other students having problems and offer assistance. This student could share the same problem and gather them to form a blog to rectify the problem.

The statements posted by the students and lecturer were letter-coded according to aspects listed in Table 3.

Table 3: *Coding Category of Blog Messages*

Aspects	Code	Description/Examples
Technical	T	connection and accessing blog content, software, configuring mobile devices, etc
Learning	L	Eliciting comments on oral presentation and reflect on them, proper phrases to be used in delivering speeches, techniques of persuasion, gestures, etc.
Moderating	M	Usually it is the task for the instructor/lecturer. Example of moderating would be encourage students to post messages and participate in blogs, ensure continuity of active participations by posting tasks or offer directions to solve problems, guide and direct students to stay focus on relevant discussion.
Teaching/Instruction	I	Commenting on presentations of other students. Giving advice on suitable techniques, appropriate gestures, or even correcting grammar errors.
Non-related	NR	Messages which are not related directly to the course such as invitation for an event, expression of boredom or frustration, expression of gratitude, happiness or satisfaction, etc. Some of these messages are worthwhile to be analyze; for example in detecting the language needs of the students such as when a student express his frustration on not be able to relate to his audience.

This letter-coded method would help us to categorize the messages according to tasks and activities for every stage to provide a better understanding of the progress of students' learning and use of scaffolding from one stage to another. This would also aid in re-categorizing of the stages to suit mobile language-learning. Besides analysis of students' messages, we conducted focus group interviews with all the students to improve understanding of students' experiences (Morgan, 1988 in Salmon, 2000) in using their mobile devices in

enhancing their language-learning. This would also ensure reliability of data collection. Based on the results, adaptations made in the model were presented to a panel of experts for evaluations.

There were sixteen(16) experts with at least 15 years of teaching experience in language teaching, and either have experience in evaluating new technology in instruction or evaluating language content materials. Eight of the experts were course instructors of the course subject being studied. The experts are required to indicate their responses based on 5 point Likert scale for each proposed adaptations in each stage in the questionnaire. They are also allowed to contribute any additional comments for the items in the space provided at the end of each stage. Responses from the experts will be analyzed for median and inter-quartile range. The use of median aligned with the literature which favours the use of median scores (Jacobs, 1996 cited in Hsu & Sanford, 2007) in best reflecting convergence of experts' opinion. In this study, median score of 5 is considered the highest point of agreement and vice versa median score of 1 is considered the lowest point. In another point of view, Boonan (1979) supported inter-quartile range as having higher precision compared to mean score in describing differences in experts' views on each items. In this study, consensus of experts was determined using inter-quartile range following the levels as below:

a) High consensus : Inter Quartile Range between 0 and 1
b) Moderate consensus : Inter Quartile range between 1.01 and 1.99
c) No consensus : Inter Quartile Range 2.0 and above.

FINDINGS AND DISCUSSION

The results revealed high level of students' activity in the mLearning course (refer to Table 4). The average number of postings recorded was 29 per student in this course component. In the preliminary stages 1 and 2, the lecturer's postings were more in numbers and frequency to initiate students' participation in their mobile blogs and also due to the reason the students were still new to the mode of learning (mLearning). Responses (message posted) from students were mostly short at these stages. When probed in the focus group interviews, one student commented,

> *" Actually…I want to see what is actually going on first… to have some idea how to start. Most of us observe more but it seems exciting."*
>
> (Transcript A1: 00:23:24)

One of the students who responded to the lecturer's earlier postings in Stage 1 has this to remark in the focus group;

> *"At the same time, we feel being left out if we wait longer. But we could not think what to say except, 'Yes… or I agree too'. Maybe we replied anyway… because fearing being left out."*
>
> (Transcript A1: 00:18:15)

However, as more postings were uploaded especially in discussion of the course component, the lecturer's postings decreased in numbers and in frequency, dominated by students' postings especially in Stage 3 and 4. Overall at these stages (Stage 3 & 4), the ratio of students' posting to the lecturer is 5:1. Students seemed to gain more confidence and more engaged in the discussions, especially to improve on their presentations.

Students at large also reported their appreciation in the lecturer's virtual presence either in welcoming them, posting comments, asking questions and giving suggestions, etc.) as one of them commented in the blog:

> *" I know that I have something to say… but could not figure out what it is, but when Dr Razol (their lecturer) keeps on asking questions, it changes everything. I finally get the idea what I want to talk about."* (NR)[1]
>
> (Transcript A1: 01:15:25)

This stressed the important role of the moderator [2]. Not only had the number of students' postings increased, but the postings were longer and gaining quality as some students even assumed the role as a moderator or an instructor to other students as they commented on their presentations. For example, one of the comments was:

[1] NR- Refer to Table 3

[2] Referring also to More Knowledge Others (MKO) mentioned in Vygotsky's ZPD

" I observed that in your video presentation, whenever you begin to refer to written notes in your hand, you paused more frequent and this disrupt the flow of your presentation. This reflects that you are not confident and ready though you are. I think you can present better without notes unless you can handle notes without pausing.." (I)

Table 4: *Comparison of Blog Postings Between Students and Lecturer/Technician(MKOs)*

STUDENTS'	Stage 1		Stage 2		Stage 3		Stage 4		Stage 5		TOTAL	
POSTINGS	f	%	f	%	f	%	f	%	f	%	f	%
Technical	15	14.7	21	9.8	25	10.8	21	8.2	8	6.3	90	9.7
Learning	5	4.9	16	7.4	78	33.6	82	32.2	22	17.2	203	21.8
Moderating	2	2.0	14	6.5	38	16.4	46	18.0	14	10.9	114	12.2
Teaching/Instruction	2	2.0	2	0.9	28	12.1	68	26.7	15	11.7	115	12.3
Non-related	12	11.8	46	21.4	11	4.7	15	5.9	38	29.7	122	13.1
Total	36	35.3	99	46.0	180	77.6	232	91.0	97	75.8	644	69.1
LECTURER'S/ TECHNICIAN'S POSTINGS (MKOs)												
Technical	23	22.5	22	10.2	12	5.2	8	3.1	5	3.9	70	7.5
Learning	8	7.8	8	3.7	12	5.2	4	1.6	12	9.4	44	4.7
Moderating	18	17.6	48	22.3	15	6.5	8	3.1	8	6.3	97	10.4
Teaching/Instruction	12	11.8	38	17.7	6	2.6	3	1.2	3	2.3	62	6.7
Non-related	5	4.9	0	0.0	7	3.0	0	0.0	3	2.3	15	1.6
Total	66	64.7	116	54.0	52	22.4	23	9.0	31	24.2	288	30.9
GRAND TOTAL	102	100	215	100	232	100	255	100	128	100	932	100

Another side result of this study was that the students seems to averagely score higher in Persuasive Presentation component which employed this scaffolding model via mLearning compared to other components (Process Description, Technical Oral Presentation, Business Meeting) which were conducted in conventional classroom environment. This is indicated in Table 5 which shows a higher mean score in the Persuasive component (86.7) compared to the other components (Poster-79.5, Technical Presentation -76.9 and Business Meeting- 75.1).

Nevertheless, further studies need to be conducted to obtain conclusive evidence to determine a positive increase in students' performance in a language course that employed the scaffolding model. Proper experimental studies which involve both control and experimental groups need to be conducted to establish the evidence. However, since the focus of this paper is to evaluate the model, the findings shown in Table 5 only aims to suggest further studies in the investigation of the effect of the model on students' performance in their competence rather to report an evidence.

Table 5: *Students Scores in PCS Components*

	Poster	*Technical*	*Business*	*Persuasive*
Mean	79.5	76.9	75.1	86.7
Standard Error	1.361678	1.118087	1.689305	0.83043942
Median	77.5	76.7	75	86.7
Mode	77.5	73.3	75	88.3
Standard Deviation	6.808389	5.590435	8.446523	4.1521971
Sample Variance	46.35417	31.25296	71.34375	17.2407407
Minimum	67.5	65.8	60	80
Maximum	90	85	87.5	95
Sum	1987.5	1921.8	1877.5	2168.3
Count	25	25	25	25

4.1.2 Adaptations of Gilly Salmon's Five-stage model to form the MLearning Scaffolding Model for language-learning

Based on the results from the content analysis, focus group interviews and experts' views, there were some adaptations proposed to be made in the model to suit language-learning via mLearning as shown in Figure 4. Based on this model (Figure 4), learners are expected to master the required different technical skills in each stage that involves different moderating for each stage as described above.

The running bar 'interactive bar' indicates the increasing amount and the frequency of interactions among learners, content and context as the learners progress from one stage to another. For instance, at Stage 1, the student may interact with one or two students through a couple of electronic messages and gradually increase to more students more frequently with more messages and types of messages throughout the five stages which also constitute his or her learning process. Usually at Stage 5, the acquisition of new level of knowledge and competency will lead to new learning pursuit of the learner. Probing into the details, comparing the models on Figure 3 and Figure 4, the following changes at each stage that could be observed are as follows:

Stage 1 : Similar to the original model, this stage aims to promote individual learners' access and participation in social conference by welcoming them and providing technical support to facilitate use of mobile technology and devices in learning. Technical support could be shared with instructors, system providers as well as from other learners. An example of this support is indicated below (taken from an SMS message received by students):
" You need to download 'Blogmeaway' apps into your phone. It's free. Sign up an account and you may begin to use it immediately. Please refer to me or your other friends for assistance. Remember to use your real name for your network identity."

(SMS Input 12-26)

Students moved on to Stage 2 once they posted their first messages.

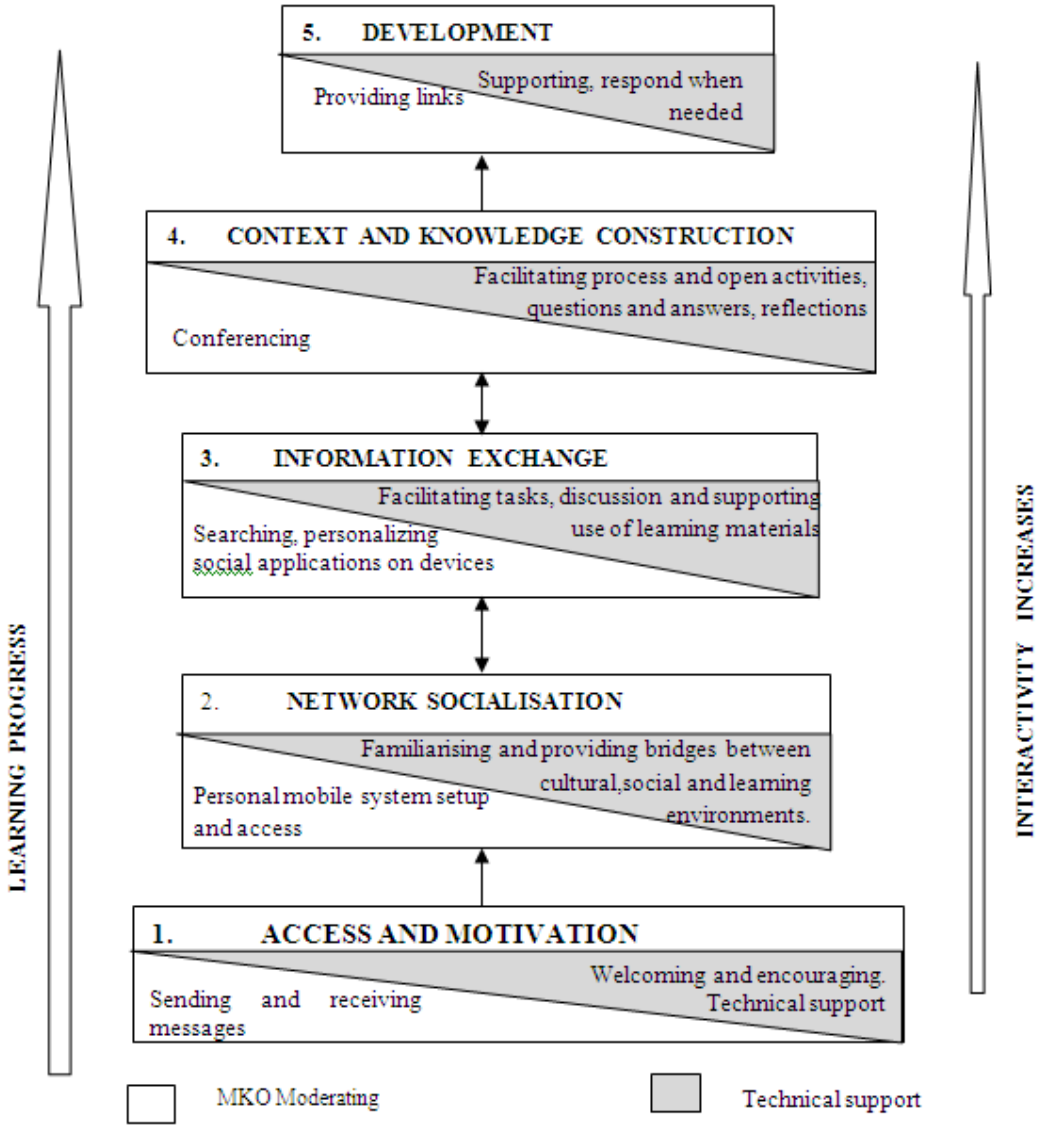

Figure. 4. MLearning Scaffolding Five-stage model (Adapted from Gilly Salmon's Model)

Stage 2: The experts propose the term 'Online Socialization' to be replaced with 'Network Socialization' to accommodate mLearning in this stage. This stage involves the students to establish their network identities rather than online identities and choose their social groups to interact by signing up as members or participants of a virtual community or even collaboratively creating own social groups relating to mutual learning needs with other individuals. Learning needs could be broad themes like socializing and writing or on specific needs like effective technical oral presentation or writing engineering research report. The term 'Network Socialization' replaced Salmon's 'Online Socialization' due to two premises:

1) Online is usually associated to connectivity to computer technology and communications which specifically refers to states or conditions of device or equipments or other electronic functional units (Federal Standard 1037C, 1996). This implies that online socialization relies on connectivity of computers and devices which is an essential factor for e-learning; thus an 'offline state' would compromise the learning process.

2) Network refers to a system of connectivity not only of technology devices, systems and applications but also of people. In the adoption of Salmon's model, network implies a shift of focus on technology to the act of individuals forming and generating communication networks among themselves to interact mediated by technology devices and applications. MLearning should place a primary focus on the learners, their mobility and interactions rather focusing on technology; hence learner-centered learning.

In the learning process, the learning environment and interaction among the learners should be the main foreground of the learners whereas the technology devices should be the background. In other words, the learning process continues with or without the connectivity of technology devices (online).

Stage 3: Stage 3 involves initial scaffoldings to facilitate students' development in their presentation skills where they begin to interact and cooperate with each other by exchanging learning experiences to support individual's learning goals. The focus of learning here should be on creating sustainable networks of human interaction to facilitate learning needs where the technology devices qualify only as medium. Information exchanges could be initiated back and forth among social softwares such as moblogs or podcasts, instant messages through Short Messages System (SMS) or Multimedia Messaging System (MMS), and voice calls on mobile devices, and face-to-face classroom interaction. Example of initial scaffoldings could be observed in the blog exchanges below:

" Student 1 : What to say first in our presentation ? So, that, people would give their attention...once we start.? Help...

Student 2 : I've got this nice idea... click on this link 'http://www.youtube.com/watch?v=7Zo1xE5a4vQ'on Steve Job's presentation. He went straight to the point announcing Iphone 4 accompanied with a simple but fantastic slide presentation with special effects."

(Blog B2)

However, the experts viewed that Stage 3 and Stage 2 should complement each other, hence the double direction arrow sign shown in Figure 4 unlike a one way follow up stage from Stage 2 to 3 in Gilly Salmon's model. As mLearning is more robust than eLearning in terms of access to learning (Saedah, Fadzilah & Muhammad Helmi, 2011), there will exist not singular but multiple social networks of separate groups of a whole community of learning which co-exist to cater various needs of learning. This is due to the mobility of the devices together with the learners coupled with robust 'push' and pull technology compared to eLearning stationary online technology, students at any time or place could effortlessly form own social groups and invite others to join. Thus, students especially at the earlier stage would move back and forth between stages 2 and 3 with the liberty to choose from a wide array of social groups before settling down on selected group to engage further into information exchanges. There are possibilities students would move back and forth between stages along their learning process while maintaining learning engagements of multiple social groups. In eLearning, due to the stationary online technology, students only learn after logging in a computer with network facilities; thus due to lack of mobility of both technology and learners, forming multiple social groups would be time consuming and students usually settle in one or two major social groups formed by the course administrator. Hence the one way advance from stage 2 to 3 in Gilly Salmon's model.

Stage 4: The experts propose the term 'Knowledge Construction' to be replaced by 'Knowledge and Context Construction'. This is the stage where interactions among students becoming more collaborative where students act on information shared in Stage 3 to form specific group discussions on mutual subjects. Students not only embark on knowledge constructions as in eLearning but in mLearning, they would also generate learning context on site that would also lead to more knowledge construction; the students may share common learning environment or context and develop the digital representation of the site or context using mobile technology. The site or context may not necessarily be a physical environment where the students is placed but could also be a network space or even a conceptual or abstract place such as a mutual learning subject or a learning problem (Nonaka, 1966). An example of this could be reflected through the blog exchanges below:

" Student 1 : Shakeel, I noticed that you are seeking help in overcoming 'stage fright... I and Suria have just form a new blog just to discuss and practice on ways to fight 'stage fright'. It's exciting. Some of our new members have even solve their problems... cool technique they used. We use live video feeds to practice and discuss ... Come, join us. (M)

Student 2 : Hey, thanks... How to join ?"(L)

(Blog B3)

Here, in the example, the students had created their separate blog on dealing with 'Stage fright' as shared context of learning dedicated for students who shared the same learning needs. Laurillard (2007) terms this act of learning through generating context as 'digitally-facilitated site-specific learning' which is an intrinsic nature of mobile technologies which is not shared by other distance learning technologies such as desktop and landlines. This type of learning is very motivating as it offers learners a high degree of ownership and control. Through digitally-facilitated site-specific, the learners could share common grounding instantaneously through digital representation of the learning environment or sites through video clips or pictures delivered to their mobile devices via MMS, podcasts, moblogs or bluetooth technology. This will consequently lead to meaningful interactions among learners to better achieve learning goals.

Again, similar to Stages 2 and 3, the experts viewed that stages 3 and 4 complement each other creating a bidirectional movement between stages as shown in Figure 4. Similarly, due to the robust mobile technology and mobility of both tools and learners, students are able to move effortlessly back and forth between stages of information exchange and knowledge constructions. In the process of constructing knowledge collaboratively, students need to continuously exchange information to allow sufficient inputs in constructing knowledge. For example, in constructing best practices in oral presentations, students need to have continuous support from each other and mobile networks to gain inputs in terms of good expressions, verbal and non-verbal language, visual aids and other essential criteria to produce effective presentations. Knowledge construction should not be time consuming and continuously developing and this is made possible with the mobility of tools and learners unconstrained by time and space unlike eLearning. Though collaborative knowledge construction is possible in eLearning environment, the stationary online networking and commitment of students to be with the computers would be time consuming and usually students would be put off by this idea.

Stage 5: This final stage is where the students reflect on what they have learned or acquired to help them achieve their learning goals. The reflection would lead to students' critical thinking to develop better or newer skills in developing higher competencies. For example, by reflecting on their learning process in Stage 4, learners would be able to understand better the elements to become better speakers and ways to utilize the new acquired skills to achieve their goals. This would also lead to new learning goals to develop further from their new acquired competency level. Another notable observation of students at this stage was that students became more responsible in their learning as they took charge in their own learning as their non-related aspect postings decrease significantly beginning at stage 3 onwards compared to stages 1 and 2. This was fairly understood as students were still familiarizing not only with the use of their mobile devices in capturing learning but also with the new mobile learning environment specifically in engaging themselves in socializing 'academically' with their peers. Although the students were familiar in using their mobile phones in socializing with others but most of the conversations were about personal and non-academic matters. They found it somewhat awkward at first to engage conversations on academic matters with their friends at first as one of the student said in one of the focus group interviews:

" I don't know about you guys... but it's weird to all of the sudden talk formal things with your friends, you know, SMS , blog or talk using phones. It's like during our school days when we were used to talk to our friends in Malay for years and force to speak to them in English all of the sudden in class. Awkward, isn't it...something like that... that's why at first I write something else at first in the blog..."

(Transcript A2: 00:25:25)

However, as the students progressed further in the stages, they became more responsible and the focus of their postings were more about Persuasive presentation matters, partly due to time constraint and deadline which the students had to meet. In Stage 5, the students were not only more focused and responsible on their learning but there were those developed critical thinking and had the ability to assess the mLearning approach as the students indicated in another focus group interview:

"Student 1 :For once I felt rewarded... rewarded to have this opportunity to socialize wirelessly with you all in learning something. I knew that we can learn something from phones but I never bargained to get a whole lot more. It brings new meaning to study in the university.

Student 2 :Yeah... you are given the trust to handle what you need to learn. I feel like my own boss.

Student 3 :"Another...in class, although I was with my friends studying together, but I felt strangely alone. Yeah...when it comes to understanding what the lecturer says, it is up to you whether you understand or not actually. Of course, we can ask questions, but I wouldn't ask if I thought everybody knows. I feel stupid to ask. That is what I mean by alone. But... through this new blog way using phones, it breaks that loneliness... it allows me to connect with others anytime having same problem and talk about the way out. In fact, I solve one of my slide presentation problems while in the bus. I learn more..."

Student 4 : I wish, we have this for all subjects in the university..."

(Transcript A3: 00:35:25)

These students were assessing how mLearning contributed to learner-centered learning giving them the opportunity to manage their on learning according to their style, pace and needs. The conversation above describes the effect of sense of ownership to students' learning. Sense of ownership is about giving choices in learning and this motivates students to learn as they could do things which they chose to rather than being told to do so (Truby, 2010; Dlodlo, Tolmay, and Mvelase,2012) although this means that the customary role of teacher-student is challenged where students take charge of the learning process instead of the teacher (Isman et al, 2012). Another point to be highlighted is that in Robiatul's conversation above, she was actually talking

about 'digitally-facilitated site-specific learning' through context mutually generated by learners in achieving common goals of learning as mentioned in Stage 4. Laurillard (2007) defines digitally-facilitated site-specific learning as a unique learning advantage through mobile devices because of the degree of ownership and control afforded and this is motivating to students towards learning.

The proposed adaptation to Gilly Salmon's model to suit language-learning in the mobile context as discussed above, received high consensus level of experts' opinion in agreeing to the adaptations where their opinions are as consistent for every stage in the model as shown in Table 6.

Table 6: *Experts' Evaluation on Proposed mLearning Scaffolding Model*

Stage	*Proposed adaptation based on study*	*Median*	*Mode*	*IQR*
1	Maintain(similar to original model)	5	5	0
2	Network Socialization replace Online socialization	5	5	0
3	Maintain(similar to original model)	5	5	1
4	Knowledge and Context Construction replace Knowledge Construction	5	5	0
5	Maintain(similar to original model)	5	5	1

*IQR- Inter-quartile range

LIMITATION OF THE STUDY

This study was conducted using case study method based on context-based. Adaptation of the model was done based on a small case study among ESL undergraduates of a private university based on a component of a communication skills course subject. The duration of the case study was conducted for 48 days due to logistics and the institutional concerns. However, the reliability and the validity of the adaptations made rely heavily on the experts' consensus opinion. In addition, more than half of the experts were also course instructors of the course subjects being studied.

CONCLUSION

The theory and the model discussed in this paper were adopted and adapted to describe how undergraduate language learners learn through peer interactions at the tertiary level in the context of mLearning in undergraduate language-learning. Theorizing mLearning should be based on the instructional problem or goals and then select the most appropriate theory options to help address the problem or goals of instructions. This paper adopted Vygotsky's Zone of Proximal Theory to view how students learn in general via mLearning, and to support further specifically on how students fulfill their language learning needs. Gilly Salmon's five-stage model was adapted and proposed to describe how learners learn language via mLearning based on the proposed Vygotsky's theory.. The adaptation made was made based on the case study conducted on undergraduate language learners in a private university as presented in this paper. In terms of the use of the scaffolding model, it was encouraging to find a high level of participation among students as they progressed from one stage to another, not only in terms of numbers and frequency but also in terms of length and quality. Quality here means that the students progressed from asking questions or seeking help, to giving comments as moderators or assumes the instructor's role in responding to their peers' oral presentation or problems. Negotiation of knowledge in meeting their learning goals through interaction among themselves is the key element in this scaffolding model.

The results also revealed that students' performance in the persuasive presentation component using this scaffolding mLearning model averagely scored higher grades than other course components. It would be worthwhile to investigate more in-depth the effectiveness of the model compared to conventional face-to-face classroom approach to the course. However, students also provided critical reflection and constructive feed-back on the learning process as indicated in their blog postings, especially in giving their views on how mLearning helped them in reaching their learning goals. Nevertheless, there were some limitations of the study. First, there were of course other modes of communication used among students besides blog messages: SMS, MMS and voice calls. Unfortunately, recording of these data for analysis were very limited to us. The duration of study is short due to administrative constraint as explained in this paper. A few students especially with lower language competence failed to progress through all five stages due to the short period of time. Although, the time allowed for us to conduct the study was not enough as some students failed to work on all stages, the implementation of the model was considered successful judging from the average higher grades obtained by the students in this course component.

Based on these experiences, the adapted MLearning scaffolding five-stage model would suggest a few implications in language instruction and learning through mLearning for future education:

a) The model could be use as an example to define the uniqueness of mLearning where the focus of learners are not primarily on technology (it is not about having full courses in the mobile phone), but on learning itself (for example, context of learning, learning needs and aims, etc) mediated by the technology;
b) As the model interweaves both formal and informal learning, it could aid in the incorporation of mLearning for language-learning in mainstream education as an effort to resolve the issue of its incorporation such as the use of mobile phones in schools, the change in teachers' and students' role, etc.;
c) Implication to the design of mLearning for language-learning. For example, the model could be used as a guide in designing learning activities in a mobile environment which emphasizes on scaffolding to aid students engage in effective interaction, which leads to collaboration in meeting individual and shared learning goals;
d) Implication to the roles of instruction where moderating would be seen as a replacement of teaching. As a moderator, the teacher or the lecturer would be part of the learning system or as the co-learner in mLearning as described in this study. The moderator would not only guide, share knowledge, learn together but also motivate by posting appropriate questions, tasks and information to students in encouraging them to participate in social learning or triggering some ideas to move forward. The moderator would further guide the students in identifying their learning needs and aims too. This change in the role would define further the concept of a facilitator in learner-centered learning. Teacher training would take a new leaf to become moderator training then to accommodate a new learning trend, learning context, environment and as well as a new genre of technology; and
e) The model could also be adapted to design learning in other areas of learning such as science, history or even sports.

Hence, we would also like to propose using the model adapted as an approach for further development of language courses in the university to complement mainstream classroom instruction to begin with. There are equally important opportunities for further development of the proposed adaptation of the MLearning scaffolding five-stage model. For instance, it is suggested to develop standard criteria to assess 1) the quality of students' input in the mLearning activities; 2) students' construction of shared learning context, especially in their motivation to do so and their selection of approaches; 3) students' ability in giving critical reflection on views and arguments and how they develop these skills; 4) how students progress from one stage to another especially whether it is self-directed o directed with the aid of others. These criteria also serve as areas for further research in the use of the model which also may lead to further enhancement of the model. Further studies could also be conducted to find out whether other variables such as gender or language competency do affect the quality of participation of students. It would certainly be equally interesting to find out whether students' achievement in language-learning using this model via their mobile devices would continue to progress significantly compared to conventional classroom approach when the novelty factor of technology wears off. These research areas would bring great impact in the defining better learning solutions for future language learners which ideally shift learning ownership to learners themselves, one which allow these learners the liberty to choose suitable ways to fulfil their learning needs according to their ability, competence and pace. In this point of view, mLearning secures a better chance in paving the direction for future learning and the proposed adaptation of the five-stage model discussed in this paper facilitate the way forward.

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