# INTERPRETIVE STRUCTURAL MODELING OF MLEARNING CURRICULUM IMPLEMENTATION MODEL OF ENGLISH LANGUAGE COMMUNICATION SKILLS FOR UNDERGRADUATES

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**ABSTRACT**
In the field of distance education, learning mediated through mobile technology or mobile learning (mLearning) has rapidly building a repertoire of influence in distance education research. This paper aims to propose an mLearning curriculum implementation model for English Language and Communication skills course among undergraduates using Interpretive Structural Modeling (ISM) technique. The model was constructed to complement the formal in-class learning in view of mLearning as a solution to cater the diverse undergraduate language learning needs. The ISM technique was used to integrate selected expert views to develop the model which was generated through ISM software. The model consists of a network of mobile language activities and in-class activities determined prior to the development of the model through focus group activity. Findings of the study resulted in an interpretive structural model of a network of mobile language activities weaved into in-class activities which could dynamically illustrate how undergraduate language learners with different learning needs could be solved collaboratively via mLearning. The model was further evaluated to be refined by the experts. Interestingly through the evaluation, the experts found out that the activities in the model could be classified into three main domains: Knowledge Input activities, enabling skills activities, and Evaluation and Reflection activities without disrupting the relationships among the activities. This categorization of the activities aims to guide the curriculum implementers through how an activity or a group of activities influence or depend on other activities which is vital, for example in determining sets of appropriate mobile learning and in-class activities for a particular lesson to fulfill the course outcome in optimally aiding more students to achieve their individual learning targets.
**Key words:** mLearning, Interpretive Structural Modeling, curriculum implementation model, communication skills

## INTRODUCTION
Language learning differs from other subject in the curriculum as learning a language requires integration and fluent application between the explicit learning of vocabulary and language rules with unconscious skills development (Milton, 2006). This implies that language learners need to master both grammatical knowledge and fluency. As it may be feasible to acquire knowledge in grammar in the formal classroom, it is not always true for fluency. It is often difficult to provide enough time and space in the classroom for every students to develop fluency especially a few hours of lessons per week may fail to provide meaningful exposure required for all students to learn. The general large numbers of students in a language class in the higher education would further limit individual students' contact hours with their lecturer. To add to this difficulty, most language instruction is still based on drill and exercise principles, discarding fluency and language competence out of classroom practices. In the universities, English courses offered consist of two major types: a) English for competency (EFC), for example English as a Second Language (ESL), English as a Foreign Language (EFL), English as Additional Language (EAL) and others; b) English for Specific Purposes (ESP), for instance Business English, English for Science and technology (EST), Professional and Communicational Skills, and others.

Except for students who opt for EFC as their major field, most of the English courses for students who chose to have their major in engineering, medicine, business, science, law, philosophy, psychology, and other fields would be offered ESP which generally aimed for professional conduct of students for future job environment in their respective field. The main ESP courses would be based on communication skills (both in writing and in speaking skills). Undergraduate students are expected to be proficient in written and spoken language as the nature of ESP concentrates more on language in context related and integrated in their subject matter compared to EFC which focuses especially on grammar and language structures. However, due to factors like time and lecturer-student ratio, ESP lecturers generally would hardly commit in solving students language proficiency problems, instead, fulfilling the university ESP syllabus. Often, students who are still chained to their inability to express themselves competently compared to their peers who are more proficient in English language would have to deal with their handicap while undergoing their required undergraduate ESP courses. They would have to struggle harder in making sure there are no fundamental grammatical errors at undergraduate level in submitting their English academic articles, or no unacceptable mispronunciations and grammar slips in presenting their oral presentations. Ideally compared to their more proficient and competent peers, the less proficient and competent students would need more time, space and personal guidance or tutoring to help them to at least be able to perform appropriately in class and later in future job environment. However, as indicated here, it is not possible for the lecturers to fulfil these students' needs due to time and logistic constraints.

Since mobile devices and technology which are readily afforded by the present generation of students, interaction among them is facilitated by social networking unlimited by time and space. Interaction among students of new generation has taken a new form where personal data and mutual interests could be shared and published through robust social softwares ((Isman, Abanmy, Hussein, and Al Saadany, 2012). Mobile Learning (mLearning) or learning mediated through mobile devices and technology coupled with robust mobile interaction environment could offer a viable solution to students to access aid in fulfilling their learning goals or solving their language learning problems. In addition, past researches have evidently stressed on the positive effect of mLearning on students' learning. For example, a mobile learning tool (MOLT) developed by Cavus & Ibrahim (2009) shows that undergraduate students enjoyed and are able to learned new vocabulary using Short Message Service (SMS) text messaging through their mobile phones. It is even indicated in another study that mobile phones is more effective as a vocabulary learning tool compared to traditional vocabulary tool (Basoglu & Akdemir, 2010). Besides these, other past researches has evidently pointed out that mLearning is very effective in teaching and learning. In one study conducted by Saran Cagiltay and Seferoglu (2008), mLearning via mobile phone is found to enhance students 'language skills in the English Language with the incorporation of multimedia use mediated by the mobile device. Students are reported to be more motivated to learn the language even during their leisure hours. The study also revealed that MMS and SMS aided effectively in improvement and retention of vocabulary among the students. Another interesting study involving illiterate students found mLearning as a key success in the ability of the students to read and write (Collet & Stead, 2002; Traxler, 2007).

In the context of the study described in this paper, through synchronous and asynchronous mobile communication, students could gain help in improving their language competence through social networking beyond classroom hours anytime and anywhere. The flexibility of learning which allow students to participate and manage their own learning here stresses the role of the online environment (Isman, 2004) provided by the mobile communication technology. To add, through mLearning as complement to formal classroom learning, students could facilitate own learning (learner's autonomy) and indirectly allowing a sense of ownership. 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).

In short, in this study, employing mLearning not only could be regarded as a complement to formal classroom learning but also to augment classroom learning (Quinn, 2011; Terras and Ramsay, 2012). Learning activities which are engaged in the classroom could be continued and developed through mobile interaction beyond classroom walls and time, facilitating more students to fulfil course learning outcomes despite of students' individual different learning needs. As a solution, mLearning could help more students especially the low achievers to improve their language competence and communication skills. However, how mLearning is viable as a solution would depend on how it should be implemented. Thus, holding to the idea of mLearning as a solution to aid students to achieve their language learning needs, this study seeks to develop an mLearning curriculum implementation model to overcome language learning needs in an English communication course among undergraduates. The curriculum implementation model would consist of a network of language learning activities connecting both mobile language learning activities and formal classroom activities. The language learning activities would be selected by a panel of experts. Identifying the activities alone is not adequate

without determining the relationship among the activities in guiding both teachers and learners to fulfil course learning outcomes through collaborative interactions. However, determining the appropriate learner's activities in mobile environment alone especially in augmenting formal classroom learning could prove a daunting task as the learning situation is complex and dynamic. It would require a great deal of time and commitment to investigate each activity proposed before it could be selected. The task would further become complex as the relationships among the activities selected need to be investigated in order to produce practical guide for implementers to implement a mobile learning language initiative to aid learners to achieve their learning goals. Thus, based on the circumstances discussed above, Interpretive Structural modeling (ISM) (Warfield, 1982) was employed because not only it could facilitate investigation into the relationships among the learning activities but an overall structural model could be extracted based on the relationships for the intended mLearning curriculum implementation.

## THEORETICAL FRAMEWORK

In the development of the mLearning curriculum implementation model, this study employs Vygotsky's Zone of Proximal Development (ZPD) (1978) as learning theory to guide how undergraduate students seek and gain assistance in the mlearning process through interaction. 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).
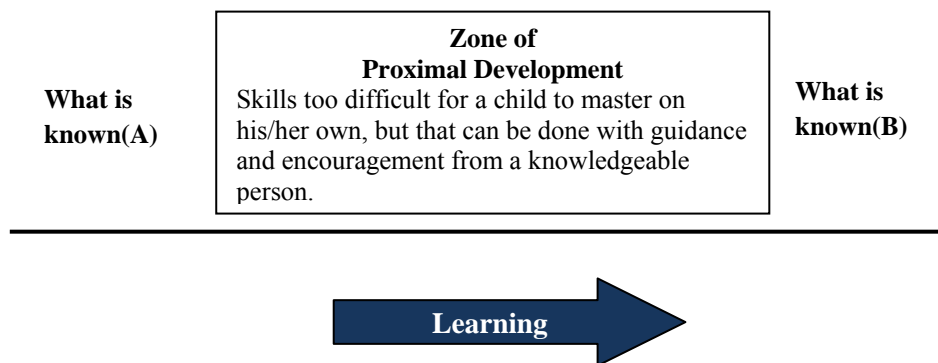


Figure 1.  Zone of Proximal Development

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. 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).

In order to guide the selection of appropriate mobile learning language activities for the model, the study employs the SAMR model developed by Ruben R. Puentendura (2006). The model was developed by Puentendura to view how one should use or incorporate educational technology. It is also a system to measure the level of technology usage in education. The model aims to assist teachers in the design and development of technology based learning to enhance learning experiences among students to reach their highest potential. The model consists of 4 stages: Substitution, Augmentation, Modification, and Redifinition as shown in Figure 2.

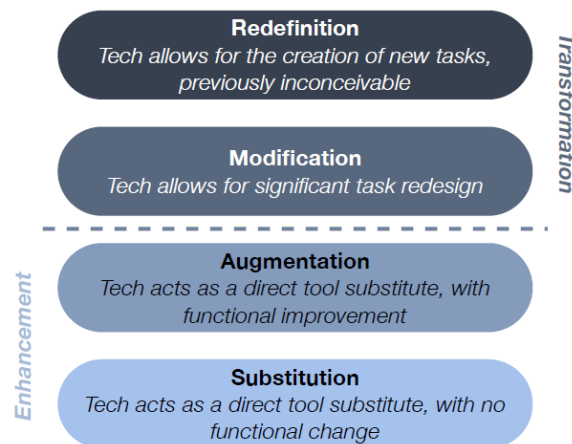Coincidentally, SAMR itself is an acronym of the stages.



Figure 2. SAMR model

The model is employed in this study in view of sustainability incorporation of technology in education. From the model, we could understand that if a technology is employed merely to do the same things differently, the level of use is only at substitution level. For example, if the current practice involves students referring to science articles from books for information, and if this practice is replaced by referring the articles on websites using a computer, the level of technology use is only at substitution level. The use at this level though is essential may not sustain once the novelty of referring to the internet information wears off. This explains why certain technology incorporations in the formal classroom in the past only sustain for a short period as the use of technology were not developed to higher level of use based on the SAMR model (Figure 2). The authors proposed the selection of mLearning activities by the experts to be guided by the model to determine activities which satisfy all levels of use in the model to incorporate better mLearning in mainstream learning.

**METHOD**
The focus of this research is the development of Interpretive Structural Mlearning Curriculum Implementation Model of English Language Communication Course for Undergraduates. The development of the implementation curriculum model is based on the integrated view and decision of a panel of selected experts. Thus, the study employs the Interpretive Structural Modelling(ISM) to develop the model. ISM was first proposed by J. N. Warfield (1973a; 1973b; 1974a; and 1976). Warfield (1982) described ISM as "a computer-assisted learning process that enables an individual or a group user to develop a structure or map showing interrelations among previously determined elements according to a selected contextual relationship'. It could also be viewed as a management decision-making tool that interconnects ideas of individuals or groups to facilitate thorough understanding of a complex situation through a map of relationships between many elements involved in the complex decision situation (Charan et al, 2008). ISM is interpretive because it involves judgment whether there are relationships among elements and if so how they should be connected. The method is structural because an overall structure could be generated using the relationships among the elements. Finally, it is a modeling technique because the overall structure and the relationships among the elements could be illustrated in a graphical model. The various steps involved in the ISM technique are:

(1)     Identifying elements which are relevant to the problem or issues. In this study, the authors employed a modified Nominal Group Technique (NGT) to identify the elements. The classic NGT (Delbecq, 1975) is an iterative process to integrate multiple individual opinions to reach a consensus in prioritizing issues. The modified NGT employed by the authors begins with a short survey of pre-listed mlearning activities. Not only the list offers a description of the scope of the outcomes the study, it guides the experts a starting point of idea to begin with. This shortened the NGT process from 4 hours to 90 minutes. In response to the survey, experts could agree or disagree with the list of activities. The activities which reach positive consensus would be included in the model. The experts would then present additional ideas on the activities which deem fit for the model. In the scope of this study, in developing a model for English Language Communication Course for Undergraduates, the authors chose to develop it for 'Professional Communication Skills (PCS)' course, an undergraduate English Language course offered by 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 modified NGT involves selected experts from the university as well as from other institutions. The experts consist of four (4) Content Experts who are course instructors of PCS from the private institution, two (2) Information Technology or mLearning experts, one policy stakeholder of the institution and one curriculum expert.

(2)     Determine the contextual relationship and relation phrase with respect to how the learning activities (elements) should be connected with each other. The contextual relationship defines what is to be accomplished (goal) and any boundary conditions or constraints along the way. In other words, the context provides focus on how the learning activities need to be connected while constructing the ISM. The PCS course outcomes were used to determine the context for the relationship of the activities. As a reference, the course outcomes were:

At the end of this course, students should be able to:
a)   apply the principles and practices of professional oral communication skills.
b)   present information confidently, accurately and fluently in a variety of professional, business and social settings.
c)   persuade effectively in a variety of professional, business and social settings.
d)   communicate interpersonally, and work effectively individually and in teams.

In short the course outcomes aim to produce students who are competent in the language and effective as communicators in the professional settings. The relation phrase determines how the relationships between learning activities are analyzed during construction of the ISM. The contextual relationship and the relation phrase were determined by the consensual experts' opinion on how the activities (elements) should be connected.

(3)     Develop a structural self-interaction matrix (SSIM) of the learning activities which shows the connection among elements. This was conducted using the aid of ISM software. Pairs of elements would be displayed by the software to allow the experts to decide through voting on the relationship before the next pair of elements was displayed. This process was repeated until all the elements being paired for relationship.

(4)  Generate the ISM model. This was done by the software after the pairings of elements was successfully conducted. The software derives the model based on the concept of pair wise comparison as and transitive logic. Transitive Logic states that for any 3 elements (A, B, C) with a given relation when:
• A has the relation to B, (written $A \rightarrow B$),
• And B has the relation to C, (written $B \rightarrow C$), • Then A has the relation to C, (written $A \rightarrow C$ or $A \rightarrow B \rightarrow C$).

(5)  The model was then being reviewed by the experts to check for conceptual inconsistency and making the necessary modifications.

(6)  The final model was then presented after the necessary modifications were made.

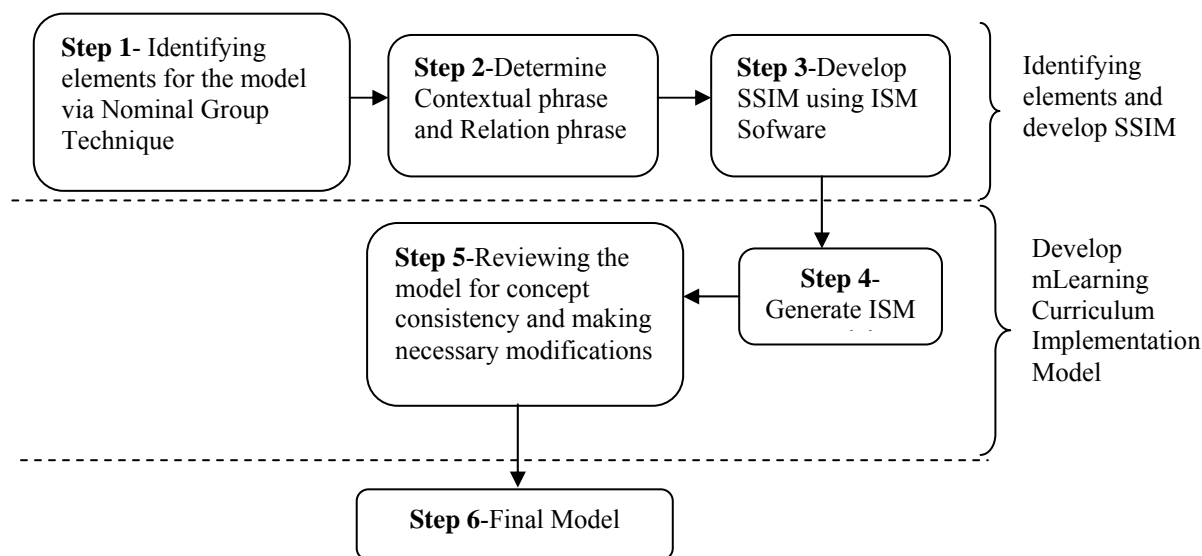Figure 3 shows a flowchart of the steps presented above to describe the methodology used for this study.



Figure 3. Flowchart of development of mLearning curriculum implementation model

## RESULTS
*Findings from Step I*
Table 1 shows the experts collective views on the learning activities which should be included in the development of the mLearning curriculum implementation model via Nominal Group Technique.

**Table 1:** Experts' agreement on the elements (learning activities) to be included in the mLearning Curriculum Implementation model.

| | *Learning activities* | *Median* | *Mode* | *IQR* |
|---|---|---|---|---|
| 1 | Attend in-class lectures on effective communication. | 5 | 5 | 0 |
| 2 | Access and listen to lectures about effective communication on podcasts through mobile devices. | 5 | 5 | 0 |
| 3 | Search and browse for information on effective communication, competence and technical use of devices through mobile devices. | 5 | 5 | 1 |
| 4 | Listening to or reading online micro information on effective communication, competence (grammar) or technical use of mobile tools and devices through 'push' technology via mobile devices. | 5 | 5 | 1 |
| 5 | Develop 'mobile tags' for information and knowledge on communication, language competence and technical use of mobile devices via QR code or social bookmarkings. | 5 | 5 | 0 |
| 6 | Record and upload presentations to illicit comments from lecturers and peers via mobile devices | 5 | 5 | 1 |
| 7 | Video conferencing with other students and/or the lecturer via mobile devices to improve communicative and competence skills | 5 | 5 | 0 |
| 8 | Online group discussions on task given by lecturer via mobile environment. | 5 | 5 | 1 |
| 9 | Establish 'learning contract' to be fulfilled through both in-class and informal (online and mobile) learning activities | 5 | 5 | 0 |
| 10 | Forming separate online small groups (social blogs) to discuss shared topics in-class or mobile | 5 | 5 | 0 |
| 11 | Forming separate online small groups (social blogs) to discuss and solve shared problems in language, communication or presentation. | 5 | 5 | 0 |
| 12 | MENTORSHIP to help students or group of students by lecturer or by other more capable | 5 | 5 | 0 |
| 13 | Synchronous or asynchronous mLearning FORUM on specific communication or competence issues | 5 | 5 | 1 |
| 14 | Collaborative redesign of in-class language activities to improve | 5 | 5 | 0 |

| | | | | |
|---|---|---|---|---|
| | communicative or competence skills | | | |
| 15 | Collaborative redesign of method to improve specific communicative or competence skills | 5 | 5 | 0 |
| 16 | Playing mobile language games either individually or in groups. | 5 | 5 | 1 |
| 17 | Learning through modelling | 5 | 5 | 0 |
| 18 | Search and browse information for content to be used for presentation materials | 5 | 5 | 1 |
| 19 | Synchronous online evaluation on students' presentation through mobile devices by the lecturer | 5 | 5 | 0 |
| 20 | Synchronous online evaluation on students' presentation through mobile devices by other students | 5 | 5 | 0 |
| 21 | Asynchronous online evaluation on students' presentation through mobile devices by the lecturer | 5 | 5 | 1 |
| 22 | Asynchronous online evaluation on students' presentation through mobile devices by other students | 5 | 5 | 0 |
| 23 | In-class evaluation on students' presentation by the lecturer | 5 | 5 | 1 |
| 24 | Reflection on what students have learned and establish new learning target to develop new or higher communication/language skills | 5 | 5 | 0 |

*IQR- Inter-quartile range

Based on the Table 1, The Nominal Group Technique session reveals that the experts consensually agreed on all the learning activities (elements) as listed in the table for the construction of the structural model:

*Findings from Step 2-* Based on the PCS course outcomes and the learning activities agreed upon, the experts identified 'In order to enable more students especially the lower performance ones to be language competent and effective communicators, the learning activity MUST be conducted BEFORE learning activity…' to guide through the SSIM process as the contextual phrase for the study while the phrase 'MUST be conducted BEFORE' is the relation phrase to relate the elements of the model.

*Findings from Step 3, 4, 5, 6-* These steps aims to develop the model through experts' decision on the relationships of the elements using pair wise technique with the aid of the ISM software as discussed earlier in the methodology section. After the model being generated, the model was reviewed by the experts and the final model is shown in Figure 4 below.

Although mLearning could be used to deliver full courses, but the primary advantage of mLearning is about performance support and complementing learning (Quinn, 2011). In line with this concept, the model should be a guide on how formal classroom learning and informal mLearning could be bridged as a solution to a wide range of learners' learning needs in undergoing a language course like Professional and Communication Skills Course (PCS)-an undergraduate course which was selected by the authors for the study. The model is structural in nature which was developed interpretively by experts constructed through a network of relationships among the learning activities identified as elements of the model. The relationship among the activities was based on the contextual phrase and the relation phrase determined earlier in step 2 of the study. The learning activities, the contextual phrase, and the relation phrase were determined according to the course outcomes of the PCS.

Briefly, the model can be divided into three domain of implementation of activities: a) the Knowledge input activities; b) the Enabling skills activities; and c) the Evaluation and the reflection activities. Based on the contextual and the relation phrase (as mentioned in findings of Step 2), the arrows show the flow from one activity to another activity as sets of sequence activities in the implementation of the three domains which interrelated with each other to form an overall structure of sequence activities for the whole mLearning curriculum implementation. For example, activities 9 or 10 need to be conducted before activities 8, 16, and 17. The activities which share a single box such as learning activities 1 and 5, 7 and 18, 6 and 13, and 19 and 23 means that the activities could be conducted in any sequence or concurrently as the pairs of activities complement each other.
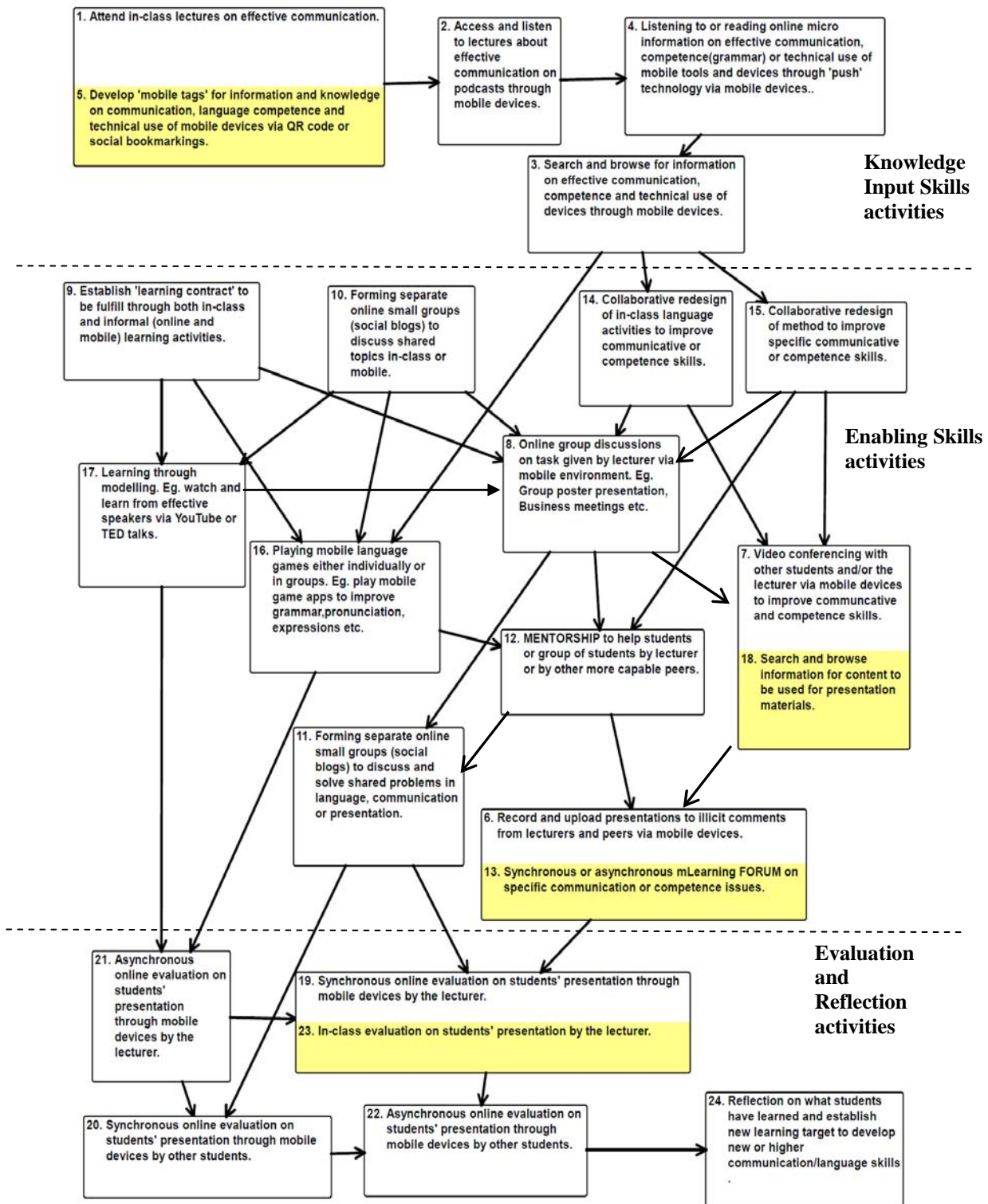
Figure 4. Interpretive Structural Modeling(ISM) based Mlearning Curriculum Implementation Model of English Language Communication Skills for Undergraduates

**DISCUSSIONS**

Based on Figure 4, activities 1(Attend in-class lectures on effective communication) and 5 (Develop 'mobile tags' for information and knowledge) are positioned highest in the Knowledge Input domain together with activities 9 (Establish learning contract) and 10 (Forming separate online small groups (social blogs) to discuss shared topics in-class or mobile) which are in the Enabling Skills domain. These activities are the most preliminary activities which need to be conducted before other activities as other activities depend on them. Knowledge input is about

delivering content. Though mLearning could be about content delivery, but it is not everything about content (Quinn, 2011). According to Quinn, as it is interactive, mLearning should be more on communication, connecting learners with the right people and resources when and where it is most needed. In learning instruction, it is critical in giving help to learners when and where it is needed and this is the main advantage of mLearning over other technology-based learning. Coincidently, parallel to this concept of mLearning, activities 10 and 9 are more on establishment of communication ground among learners through forming online social blogs and self-management of learning process via learning contracts. These are the activities proposed to be conducted at the beginning of the mLearning curriculum implementation before other activities. Thus, the course instructor could opt to conduct these activities (9and 10) concurrently with content delivery (activities 1 to 5).

Another important point that we could observe is that learning activities 1 to 5 and 9 to 10 as discussed above are integration of formal and informal learning. This is important because mLearning is also about creating a seamless space in bridging formal and informal learning (So, Kim, & Looi, 2008). For example, activity 1 is an in-class formal learning activity but pairing with it is activity 5, an informal learning activity where students collaborate to develop knowledge inputs in the form of mobile tags. This in a way complements the formal learning activity 1, where students assist the lecturer in augmentation of input through mobile context. Though the content in activity 5 could be accessed informally, but the activities to develop the tags could be done as formal learning if it is conducted in-class. However, as discussed earlier, what is more important than content delivery are the learner centeredness and communication aspects to the learning activities in augmenting formal learning experience as proposed through learning activities 9 and 10. While activity 9 allows learners' autonomy to manage own learning experience through learning contracts, activity 10 establishes online communication ground, for example through social blogs among learners to extend in-class discussion anytime and anywhere, not only to obtain information but also in collaborative negotiation of knowledge.

Coincidentally, collaborative negotiation of knowledge strives in continuous communication and here mLearning would serve as an ideal medium (Zijian, G. and Wallace, J.D., 2012). In terms of connection with subsequent activities in the model, these activities (activities 9 and 10) set as a vital precedent in overall successful implementation of mLearning. For example, the establishment of social communication environment in activity 10 is important as grounding for the implementation of activities 8 (Online discussions on task given), 16 (collaborative online language games), 12 (Mentorship), 7 (Video conferencing among learners), 6 (Record and upload presentations to illicit comments), and evaluation activities (activities 19 to 24). In short, preliminary activities (1, 5, 9 and 10) are the most important activities as they have great influence on other learning activities. These activities are situated at the top part of the model (Figure 4) either as Knowledge Input activities or Enabling skills activities.

Referring back to the model in Figure 4, the activities 8(Online group discussions on task given) and 12(Mentorship) positioned at the centre of the model have the most activities leading to them and also the most activities depending on them. These activities could be grouped as Lingkage activities. In other words, they play an important role in connecting the precedent activities and the subsequent activities together. For example, before online group discussions on task given by lecturer (activity 8), online social groups (activity 10) need to be formed first. Based on the model too (Figure 4), the conduct of online group discussion also depends on the competence and communication skills among students which could be developed through collaborative redesign of language activities (activity 14) and collaborative redesign on method (activity 15) as proposed in the model. Activity 8 would lead to proper mentorship (activity 12) for needy students, video conferencing (activity 7) for further discussion on tasks or lead to collecting further content materials for presentations (activity 18) based on what transpired in the online discussions. Furthermore, along the learning process, students who need further assistance during the online discussion would be led to form separate online groups to solved shared learning problems (activity 11).

Learning activities in the preliminary stage (activities 1, 5, 9 and 10) and linkages stage (activities 8 and 12) are in also known as strategic activities. These activities play a key role in the implementation of mLearning in augmenting the conventional classroom learning experience. Hence, activities in these domains require greater attention by the course instructors. The other learning activities either complement the development of language and communication skills among students or evaluating their achievements. Holistically, all the activities included in the model interconnectedly aid in the learning process of the communication course which aims to serve all the students' learning needs using mLearning.

In terms of the attaining the PCS course outcomes, the classified activities as discussed above were based on experts' collective decision with reference to the course objectives as mentioned in the Method section (page 5). Thus, the model derived would guide how the learning activities individually and interconnectedly help in aiding

the learners to achieve the outcomes. However, the activities are not exclusively implemented to serve a particular course outcome. An activity or a set of activities would help fulfilling multiple course outcomes during the learners' learning process. For example, learning activities 1 and 5 or 2 to 4 are essential as input knowledge for the first course outcome 'apply the principles and practices of professional oral communication skills' and activities 8, 9, 10, 11, 12, 14, 15, 16, 17, and 18 would help develop students' skills further in applying the PCS principles and practices, while activities 6, 13, 19, 22, 23, and 24 would gauge to what extend students could apply the communication skills. But these sets of activities apply too to fulfill the other course outcomes. Besides the classification of activities as discussed above, we could also observed that the activities could also fall into types of technology based learning activity as described in the SAMR model (Figure 2) as shown in Table 2.

Table 2. Distribution of Learning activities to SAMR stages.

| SAMR Model stages | MLearning Curriculum Implementation Model Learning Activities |
|---|---|
| Substitution | 2, 3, 4, 19, 20 |
| Augmentation | 8,10,11, 12, 18, 21,22 |
| Modification | 5, 9, 14, 15 |
| Redefinition | 6, 7, 13, 16, 24 |

As proposed in the SAMR model, the learning activities should allow function of technology use (mobile devices and technology) according to all stages as shown in Table 5 to optimize the full capabilities of the technology in aiding the students to fulfil their diverse learning goals as well as the course outcomes to help them to reach their highest potential.

**CONCLUSION**

The key significance of employment of technology in education is not about how exciting it is in doing things differently compared to conventional practice. Although immediate and positive impact could be realized in the introduction of certain technology and its convenience value is highly appreciated, the key significance in the end is about sustainability. Formal classroom learning has a long history since its introduction as new learning technology replacing the informal education in the past. Back then, learners have to travel far to meet teachers to acquire knowledge. When, formal schooling was introduced, it gave immense positive impact and revolutionized learning and reshape communities and societies globally till to the present. Formal schooling sustains till today not primarily due to its impact or convenience but because it became a solution to the learning needs at large. It solves learners' global problems in attaining knowledge where they do not have to travel far and frequently to meet their mentors anymore. Schools were formed as an institution to gather learners and teachers at one place and this act as a solution. The same notion should apply too in the incorporation of technology in mainstream education, which is it should be incorporated as a solution. However, whether technology could be a viable solution, it depends on how it is implemented. Thus this study was conducted to describe how mLearning as new technology tool of learning could be used as a viable solution in aiding learners to achieve their learning goals. This is accomplished through developing an interpretive structural curriculum implementation model to guide how mLearning could augment formal classroom learning in catering the learning needs of undergraduate students especially the low to intermediate level achievers. The model as discussed in this paper not only shows how mLearning could be implemented but further describes formal and informal learning could be bridged as a solution to cater the students' learning needs. In the process, the model redefines what is mLearning as a tool to augment learning and as performance support (Quinn, 2011; Terras and Ramsay, 2012) rather merely as a system to deliver a course. In directing the development of the model, Vygotsky's ZPD was employed as theoretical framework on selection of appropriate learning activities to be included in the model. Based on the framework, learning activities which are selected should describe how students could interact and collaborate with each other to learn and how they could be aided to achieve their learning goals with the help of others. Besides this, the learning activities should also involve the full capabilities of the mLearning technology. Thus, the SAMR model was employed to guide the experts in selection of relevant learning activities which accommodates all four (4) stages (refer to Figure 2). As discussed earlier, learning activities beyond substitution level would significantly justifies the incorporation of technology as activities in subsequent stages (Augmentation, Modification and Redefinition) describes activities which could not be accomplished by the conventional formal classroom but very relevant in aiding the students to reach their highest achievement. Although the model guides how mLearning could be implemented specifically for language learning among undergraduates, the study could contribute as a proposal on how mLearning implementation models could be developed for other areas of learning disciplines for other types of learners learning using mobile technology-one which is sustainable.

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