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**UNIVERSITY OF SOUTHAMPTON**

FACULTY OF SOCIAL AND HUMAN SCIENCES

Southampton Education School

**Mobile learning in English vocabulary acquisition:  
Towards implementation in Malaysian secondary  
schools**

by

**Mariam Mohamad**

Thesis submitted for the degree of Doctor of Philosophy

November 2012

# **Abstract**

**UNIVERSITY OF SOUTHAMPTON**

**ABSTRACT**

**FACULTY OF SOCIAL AND HUMAN SCIENCES**

**SOUTHAMPTON EDUCATION SCHOOL**

**Doctor of Philosophy**

**MOBILE LEARNING IN ENGLISH VOCABULARY ACQUISITION: TOWARDS  
IMPLEMENTATION IN MALAYSIAN SECONDARY SCHOOLS**

**By Mariam Mohamad**

This thesis explores the use of mobile phones to support English vocabulary learning in Malaysian schools and develops an implementation strategy which consists of the policy and procedure through an Educational Research and Development (ER&D) methodology (Borg and Gall, 1979) with the interview as the main research tool. The methodology consists of rigorous steps in developing, evaluating and disseminating the implementation strategy as well as exploring other issues associated with mobile learning implementation in Malaysian schools.

Based on the respondent's perspectives, it has been established that the implementation strategy developed in this study would have the potential to provide guidance in the implementation of mobile learning in Malaysian schools. There is also a potential to utilise mobile phones to complement the existing practices in Malaysian schools: adding value to the existing initiatives for teaching the English Language in Malaysian schools; complementing the ICT policy in the Malaysian Education System; complementing the Malaysian Smart School vision to utilise mobile technologies; and becoming an alternative teaching and learning tool. This study also explores emerging themes in the implementation of mobile learning. These are the opportunities of utilising mobile phones including: to support English Language subject; as an affordable device; as a common device among students; as a future teaching and learning tool; as an engaging and motivational learning device; to support various learning activities; and to prepare students for their future with digital literacy. The challenges identified are: misuse, current educational policy, management and maintenance, stakeholders' attitude, digital divide and personal space invasion.

The study sheds light on the situation regarding the utilisation of mobile phones including the challenges that need to be addressed to make it a reality. It is envisaged that the implementation strategy would help towards the realisation of mobile learning implementation in Malaysian schools.



## Declaration of Authorship

I, Mariam Mohamad, declare that thesis entitled 'Mobile learning in English vocabulary acquisition: Towards implementation in Malaysian secondary schools' and the work presented in the thesis are both my own, and have been generated by me as a result of my own original research. I confirm that:

- this work was done wholly or mainly while in candidature for a research degree at this University;
- where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- where I have consulted the published work of others, this is always clearly attributed;
- where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- parts of this work have been published as:

Mohamad, Mariam and Woollard, John (2008) 'Why does Malaysia need to consider mobile technologies? A review of current practices to support teaching and learning with school-age children' 2nd Asia Pacific Mobile Learning & Edutainment Conference 2008, Kuala Lumpur, Malaysia, 20-21 Nov 2008

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# Contents

Abstract .....	i
Declaration of Authorship .....	iii
Acknowledgements .....	v
Contents .....	vii
List of Figures .....	ix
List of Tables .....	x
Chapter 1: Introduction .....	1
Statement of the problem.....	6
Purpose of the study .....	7
Research questions .....	8
Significance of the study .....	10
List of definitions .....	11
Summary.....	13
Chapter 2: Literature review .....	17
Mobile phones in Malaysian schools: opportunities .....	18
Mobile phones in mainstream education: the significance .....	19
Mobile phones in the English Language subject: added value .....	25
Mobile phones in Malaysian schools: alternative technology .....	29
Mobile learning in Malaysian schools: complementing the government's vision .....	31
Summary .....	33
Mobile phones in Malaysian schools: challenges.....	35
Mobile phones in mainstream education: challenges and solutions .....	36
Mobile phones in Malaysian schools: challenges and solutions .....	46
Summary .....	48
Mobile learning and theory.....	51
Mobile learning and learning theory: the application of behaviourist theory and blended learning through mobile phones .....	52
Second language learning theory: the application of behaviourist theory in vocabulary acquisition .....	57
Second language learning theory: the role of vocabulary in second language learning.....	62
Summary .....	66
Implementation strategy for mobile learning utilisation .....	68
Curriculum integration .....	69
Policy and procedures .....	78
Summary .....	88
Chapter 3: Research methodology.....	91
Educational Research and Development (ER&D).....	91
Overview .....	92
Previous research .....	94
Justification.....	96
Research design .....	99
Implementation.....	102

Summary .....	123
Chapter 4: Research findings.....	126
Evaluation of the implementation strategy: preliminary field tests .....	126
Evaluation in preliminary field tests: concept 1 (pedagogy) .....	128
Evaluation in preliminary field tests: concept 2 (stakeholder) .....	131
Evaluation in preliminary field tests: concept 3 (technology).....	137
Evaluation in preliminary field tests: justification of the revision.....	140
Summary .....	146
Evaluation of the implementation strategy: main field tests .....	151
Evaluation in main field tests: concept 1 (pedagogy) .....	152
Evaluation in main field tests: concept 2 (stakeholder) .....	156
Evaluation in main field tests: concept 3 (technology) .....	163
Evaluation in main field tests: justification of the revision.....	168
Summary .....	173
Dissemination and distribution of the implementation strategy .....	180
Summary .....	189
Emerging themes in the implementation of mobile learning .....	192
Emerging themes: opportunities .....	194
Emerging themes: challenges.....	202
Summary .....	215
Chapter 5: Discussion and conclusion .....	219
Summary of the study.....	219
Research questions answered .....	223
Scope and limitation of the study.....	241
Implication of the study and future research.....	244
References.....	249

## List of Figures

Figure 1: Concepts in mobile learning: pedagogy, stakeholder and technology .....	4
Figure 2: Research question 1 and the sub-question .....	9
Figure 3: Research question 2 and the sub-questions .....	10
Figure 4: Research question 3.....	10
Figure 5: The Smart School milestones-four waves (The Smart School, 2005) .....	33
Figure 6: Learning theory and approaches to pedagogy .....	52
Figure 7: Second language learning theory .....	58
Figure 8: The role of vocabulary in second language acquisition and the approach to acquire vocabulary .....	62
Figure 9: Structure of an e-learning transaction (Gilbert and Gale, 2007) .....	70
Figure 10: Initial structure of the proposed mobile lessons.....	72
Figure 11: Student progress tracking system .....	74
Figure 12: Mobile learning management system.....	75
Figure 13: Processes in action research .....	96
Figure 14: Processes in Educational Research and Development (ER&D).....	97
Figure 15: Steps in Educational Research and Development (ER&D) adopted in the study.....	101
Figure 16: Research question 1 and the sub-questions .....	108
Figure 17: Research question 3.....	109
Figure 18: Transcription 1.....	111
Figure 19: Transcription 2.....	112
Figure 20: Transcription 3.....	112
Figure 21: Tree nodes and the sub-tree nodes derived from the interviews.....	113
Figure 22: Transcription 4.....	114
Figure 23: Transcription 5.....	114
Figure 24: Transcription 6.....	115
Figure 25: Transcription 7.....	115
Figure 26: Tree nodes and sub tree nodes: emerging themes .....	115
Figure 27: Excerpt from the data analysis with Inspiration 8 .....	116
Figure 28: Research question 2 and the sub-questions .....	122
Figure 29: Research question 1 and the sub-questions .....	127
Figure 30: Research question 1 and the sub-question .....	151
Figure 31: Research question 2 and the sub-questions .....	180
Figure 32: Opportunities to implement mobile learning in Malaysian schools .....	192
Figure 33: Challenges to implement mobile learning in Malaysian schools.....	193
Figure 34: Research question 1 and the sub-questions .....	223
Figure 35: Research question 2 and the sub-questions .....	224
Figure 36: Research question 3.....	224

## List of Tables

Table 1: Subjects in primary and secondary schools in Malaysia (Bakar, 2006; Ministry of Education Malaysia's Official Portal).....	26
Table 2: Example of the most common SMS language .....	39
Table 3: Mobile learning projects underpinned by behaviourist learning.....	61
Table 4: Ownership model based on Vahey and Crawford (2002).....	78
Table 5: Ownership model based on Williams (2006) .....	79
Table 6: Management and maintenance of mobile devices based on K-12 Handhelds Official Website, Bonifaz and Zucker (2004), Zucker (2005), McFarlene et al. (2007).....	82
Table 7: Issues which should be highlighted in parents' evenings based on (Gateway, 2005; Gateway, 2008) .....	87
Table 8: Comparison of educational evaluation and educational research based on Gall et al. (2007) .....	93
Table 9: Steps in Educational Research and Development (ER&D) based on Borg and Gall (1979) .....	99
Table 10: The similarities of steps in Borg and Gall (1979) and Dick and Carey (1979).....	100
Table 11: Summary of the findings in preliminary field tests in the indication of the contribution in the revision of the implementation strategy.....	145
Table 12: Summary of the findings in main field tests in the indication of the contribution in the revision of the implementation strategy.....	173
Table 13: Summary of the findings in preliminary field tests in the United Kingdom and main field tests in Malaysia in the indication of the contribution in the revision of the implementation strategy .....	222

## Appendices

Appendix A: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests) .....	285
Appendix B: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests) .....	305
Appendix C: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Dissemination and Distribution Stage) .....	325
Appendix D: Interview schedule for head teachers and deputy head teachers in the preliminary field tests.....	347
Appendix E: Interview schedule for ICT subject leaders in the preliminary field tests .....	350
Appendix F: Interview schedule for English subject leaders in the preliminary field tests.....	353
Appendix G: Interview schedule for head teachers and deputy head teachers in the main field tests.....	356
Appendix H: Interview schedule for ICT subject leaders in the main field tests....	359
Appendix I: Interview schedule for English subject leaders in the main field tests	362
Appendix J: Interview schedule for officers in the dissemination and distribution stage.....	365



# Chapter 1: Introduction

**“If we had the power to change instructional practice through the introduction of new technologies, what sort of changes would we really like to see?”**

**(Koshmann, 1997, p. 2)**

The motivation for my research is based on my interests and my experience. My journey began when I participated in the Multimedia Systems Conference of 2006, organised by the School of Electronics and Computer Science at the University of Southampton. This was a compulsory learning activity for a subject during my first degree; Multimedia Systems: COMP 3013. With a paper entitled “Mobile Learning: The Next Education Environment”, I started to discover the new exciting world of what is known as Mobile Learning (Mohamad, 2006). I continued my postgraduate study with a Master of Science in Computer Based Learning and Training, which is a course that covers the area of ICT in education. Throughout this year, I took the opportunity of exploring the knowledge and developing my understanding of Mobile Learning. As far as possible, I linked all my assignments with Mobile Learning areas. My dissertation was also related to Mobile Learning and focused on a feasibility study on Mobile Learning implementation in developing countries, concentrating on Malaysia as a case study (Mohamad, 2007).

This study answers the question raised by Koshmann (1997) of how to revolutionise the curriculum in Malaysia through the integration of emerging technologies. The Malaysian Educational System has been through a dynamic transformation, with the Smart School implementation in 1997 emphasising the use of ICT in schools (The Smart School, 2005). However, because of the economic turmoil during that year, the progress of the project was obliged to slow down even though its mission was to transform all schools in Malaysia into Smart Schools by the year 2010 (Wan Ali *et al.*, 2009). Although it can be seen that, in most Smart Schools, ICT has been widely deployed, especially through desktop computers, it is still a challenge to provide all schools in Malaysia with these facilities (Ministry of Education, Malaysia, 2008). Thus, it is timely for Malaysia to consider alternative tools, including mobile phones, to enhance teaching and learning. It is not the intention of this study to provide recommendations that might replace the existing

educational system in Malaysia; it is intended simply to enhance it. The aim of this study is to develop an implementation strategy that complements existing policy by the Ministry of Education, Malaysia in deploying ICT in teaching and learning and in deploying mobile technologies to support the vision of the Malaysian Smart School (The Smart School, 2005; Ismail, 2008).

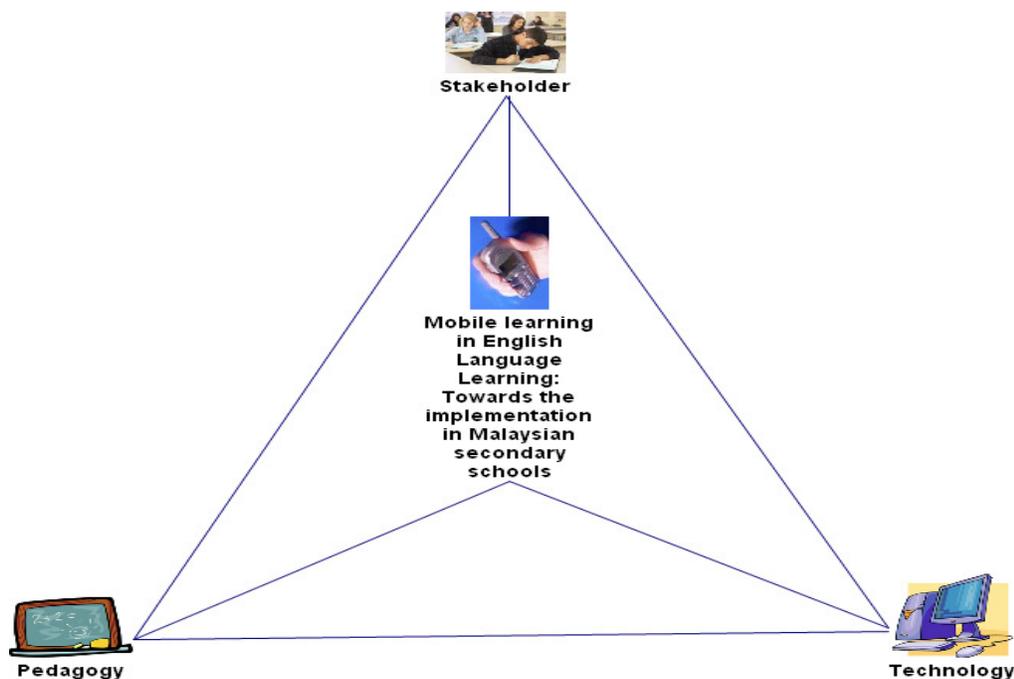
The Ministry of Education, Malaysia has applied the cascade model for many years; including on the implementation of the Malaysian Smart School (Thang *et al.*, 2010). However, Choong (2001) believes that the cascade model which is underpinned by top down approach would result in the teachers being left out of the change process; their opinions are not taken into account because the decision is made solely by the government. Within the top down approach, change initiatives are centrally-led and mandated from the higher management in the Ministry of Education, followed by local educational bodies and finally to the school principals who are responsible to disseminate it to teachers (Malakolunthu, 2007). Thang *et al.* (2011) seek to change this system by proposing new communities of practice (CoP) approach in Malaysian Smart School. It appears that CoP approach support the notion of change driven by the community rather than the government where teachers sharing concern regarding practice based issues, knowledge and skills by working collaboratively among themselves. As established by Thang *et al.* (2011), there are challenges to this approach; this is related to the teachers' attitudes that do not see the relevance of this approach to their need as individuals, and also because of time pressure and performance anxiety. Nevertheless, bottom up approach which was advocated in CoP could be an alternative to bureaucratic control in the educational system. As stated by Nambiar *et al.* (2011), CoP allows the development of better idea or suggestion from the teachers. CoP could provide a channel where teachers' voice can be heard in promoting change in Malaysian schools. Parallel to CoP approach, this study applies bottom up approach as opposed to top down approach in bringing change in Malaysian secondary schools including the Malaysian Smart School. The perspectives of teachers and the management personnel in Malaysian schools are taken into account in the development of the implementation strategy before disseminating it to the officers in the Ministry of Education, Malaysia.

When presented with proposals for Mobile Learning to support English Language vocabulary learning, people are interested in the rationale for introducing it to that particular subject rather than other subjects. The aim is to bring added value to the existing initiatives by the Ministry of Education, Malaysia to improve the students' command of the English Language. The government has invested millions of Malaysian Ringgit in utilising ICT to raise students' interest in this subject and to enhance the learning process (Ismail, 2003; Chan, 2002; Muhammad *et al.*, 2004; Samuel and Abu Bakar, 2007; Abdullah, 2006; Cloke and Sharif, 2001; Bajunid, 2001; Idrus and Atan, 2004). Moreover, the government has also introduced special programmes in the English Language subject, such as English for Teaching Mathematics and Science (ETEMS) and Upholding Bahasa Malaysia and Strengthening English (UBMSE), as additional efforts to improve English Language proficiency (English for Teaching Mathematics and Science (ETEMS) Official Portal, Ministry of Education Malaysia, 2009).

The idea of proposing vocabulary learning via mobile phones was also related to my childhood experience. Growing up in a family that stressed the importance of academic achievement, especially in the English Language, I was trained to have "a daily dose" of English Language vocabulary through flash cards. At that time, I did not realise that what I was experiencing was a method of vocabulary acquisition, which is known as rote learning or intentional learning according to the behaviourist theory of learning (Kadirire, 2009). Actually, this method of learning has its strengths although, for some people, it might be a dull process, as it requires a high level of motivation. Exploiting technological devices, which are currently popular among teenagers, could well be a viable method of stimulating their interest in learning English.

In proposing the use of mobile phones for English Language learning in Malaysian secondary schools, three concepts have been identified: pedagogy, stakeholder and technology. In the integration of learning technology, it is important to ensure that the technology proposed would make the teaching and learning process pedagogically sound. The pedagogy should drive the technology, not the other way around. In addition, stakeholders who will be involved directly or indirectly have been identified as important. Without them, technology alone may not have any

impact. Besides, a systematic approach in technology planning and management is the key to assuring the success of the implementation and helping to sustain it. These three concepts are the basis of the study. The concepts are represented in Figure 1.



**Figure 1: Concepts in mobile learning: pedagogy, stakeholder and technology**

In this study, an implementation strategy to use mobile phones in supporting English Language learning in Malaysian secondary schools is developed. As mobile learning is moving from a trial project to implementation, researchers have stated that there is a need to develop policies and guidance for the use of mobile technologies in learning (Mifsud, 2003; Valentine, 2004; Hartnell-Young and Heym, 2008; Ellie, 2005; Cui and Wang, 2008; Shuler, 2009; Attewell *et al.*, 2010; Passey, 2010; Quinn, 2011). Thus, the implementation strategy could be regarded as guidance for the utilisation of mobile learning in Malaysian secondary schools.

The implementation strategy consists of two parts: Part 1: Mobile technology integration into the curriculum; and Part 2: Policy and procedure for mobile learning implementation. Part 1 is further divided into two subsections called “Mobile lessons” and “Resourcing mobile learning”. “Mobile lessons” includes suggestions regarding the content and structure of the mobile lessons. “Resourcing mobile

learning” includes suggestions for providing facilities to support English Language learning through mobile technologies. Part 2 of the implementation strategy is further divided into five subsections: “Ownership model”, “Acceptable use policy”, “Management and maintenance”, “Specific roles for supporting mobile learning” and “Support for major stakeholders”. The section pertaining to the ownership model includes suggestions regarding the proposed strategy for helping students acquire mobile devices. The “Acceptable use policy” covers the policies and procedures to guide students in using mobile technologies for learning. “Management and maintenance” includes the strategies for managing and maintaining the devices in the implementation. “Specific roles for supporting mobile learning” makes suggestions regarding the role of technical support, maintenance assistants and English subject leaders to support mobile learning implementation. Finally, “Support for major stakeholders” suggests approaches for supporting students, teachers and parents in the implementation.

This study is underpinned by Educational Research and Development (ER&D) methodology by Borg and Gall (1979) with the interview as the main research tool. The methodology consists of rigorous steps in developing and evaluating the implementation strategy as well as exploring other issues associated with mobile learning implementation in Malaysian schools. It consists of 3 phases of field tests: preliminary field tests, main field tests, and dissemination and distribution. In preliminary field tests and main field tests, the implementation strategy is evaluated by educational experts in schools in the United Kingdom and Malaysia. They are ICT subject leaders, English subject leaders and management staff, i.e. head teachers and deputy head teachers from four schools in the United Kingdom and nine schools in Malaysia. It is the outcome of this study that the implementation strategy is validated or modified as a result of consultation from the range of stakeholders and experts in education from the United Kingdom and Malaysia. In the dissemination and distribution, the implementation strategy is distributed to five officers of the Ministry of Education, Malaysia. In addition to disseminating and distributing the implementation strategy, the officers’ opinions are also gathered to explore the potential of mobile learning via mobile phones to complement the existing practices in Malaysian schools.

Moreover, this study has also explored the emerging themes in implementing mobile learning as raised by the respondents in the preliminary field tests in the United Kingdom, the main field tests in Malaysia, and in the dissemination and distribution stage in Malaysia. These themes are explored in order to contribute towards an understanding of the situation regarding the implementation of mobile learning via mobile phones in Malaysia.

### **Statement of the problem**

The significance of developing an implementation strategy for mobile learning utilisation in Malaysian secondary schools has been established in the literature review. The review established the rise of mobile learning interests in Malaysia. One of the research areas is related to the development of mobile lessons and applications for school children (Salam *et al.*, 2008; Mahamad *et al.*, 2008; Shiratuddin and Zaibon, 2009). In addition, there are some studies on developing a mobile learning curriculum for Malaysian secondary schools (Siraj and Saleh, 2003; Siraj, 2004; Shuib, 2009; Dewitt and Siraj, 2010). However, there is no literature highlighting the strategy to implement mobile learning in Malaysian secondary schools. Thus, an implementation strategy is specifically formulated for use in the Malaysian Educational System.

In implementing mobile learning in Malaysian secondary schools, it is also important to establish the prospect of using mobile phones to complement the existing practices in Malaysian schools. Therefore, the study was also conducted to establish the following key points: the potential of mobile phones to add value to English Language learning; the potential of mobile phones to become an alternative teaching and learning tools; and the potential of mobile phones to complement the government's vision of utilising ICT and mobile technologies. It has also been established that there are emerging issues regarding the implementation of mobile learning in mainstream schooling (Hartnell-Young and Heym, 2008). Nevertheless, there is an absence of studies exploring the emerging issues regarding the implementation of mobile learning in Malaysian secondary schools. Therefore, this study aims to provide this information.

## **Purpose of the study**

The purpose of this study is to develop, evaluate and disseminate an implementation strategy for mobile learning utilisation to support English language learning in Malaysian secondary schools. It follows an Educational Research and Development methodology by Borg and Gall (1979). It is interpretivism in that it promotes multiple interpretations in evaluations. It involves qualitative approaches and natural settings with the examination and analysis of text. Being interpretivism, it interprets the data through the lense of the researcher. The data collection is interweaved with interpretivism, as it requires integration of multiple realities; the perspectives from the researcher and the teachers from the United Kingdom and Malaysia as well as the officers in the Ministry of Education, Malaysia. Various perspectives give multiple statements of reality and all this will bring as the researcher's reality, so the conclusion is the researcher's reality but impacted upon by the realities expressed. From this, the implementation strategy to utilise mobile learning in Malaysian schools is proposed. It also explores the issues related to mobile learning implementation. As the study requires qualitative strand, the large picture is interpretivism. There are ethnographic elements drawing up the implementation strategy and the emerging issues of implementing mobile learning by the people affected by the implementation. They are reflecting on their own professional lives' and the implication of mobile learning for them. For example, with regard to the English subject leaders, ICT subject leaders, head teachers and deputy head teachers at schools; they are reflecting upon the social, ethical and pedagogical implications of the use of mobile phones in mainstream schooling. With regard to the officers in the Ministry of Education, Malaysia, they are reflecting upon the policy implication of the use of mobile phones; they are the people who involved in the policy development in Malaysian schools. In addition, as a major part of interpretivism, it is also has to be set in cultural context; Malaysia is the cultural entity.

It is envisaged that the implementation strategy will be regarded as guidance for implementing mobile learning in Malaysian secondary schools. Moreover, this study also explores the potential of utilising mobile phones to complement the existing practices in Malaysian schools. The study covers the following issues: to establish the potential of mobile phones to add value to the existing initiatives in improving

students' command of the English Language; to establish the potential of mobile phones to complement the government's vision of utilising ICT; to establish the potential of mobile phones to complement the government's vision of utilising mobile technologies; and to establish the potential of mobile phones to become an alternative teaching and learning tool. Finally, this study also explores the emerging issues regarding the implementation of mobile learning in Malaysian schools. These emerging issues are explored to shed light on the situation regarding the utilisation of mobile phones in mainstream schooling in Malaysia.

### **Research questions**

In this study, three research questions have been developed. The concepts explored in the research questions are identified through the literature review. The concepts describe the academic discussions with colleagues to explain the literature. The first research question is related to the content of the implementation strategy. It establishes the strategy to implement mobile learning in Malaysian secondary schools, which is highlighted in a handbook as part of the study. The handbook is called "Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia". This research question is explored during the preliminary field tests in the United Kingdom and the main field tests in Malaysia. The research question is:

**What is an effective implementation strategy in utilising mobile learning for the English Language vocabulary acquisition in Malaysian secondary schools?**

To answer this research question, three concepts are explored: pedagogy, stakeholder and technology. These concepts become the basis of the research sub-questions:

Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?		
 Pedagogy	 Stakeholder	 Technology
<p>1.1 What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?</p> <p>1.2 What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?</p> <p>1.3 What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?</p> <p>1.4 What is an effective implementation strategy in delivering mobile lessons to enable students master the mobile lessons?</p>	<p>1.5 What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills for the implementation?</p> <p>1.6 What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills for the implementation?</p> <p>1.7 What is an effective implementation strategy in ensuring that parents are well-informed about the implementation to foster their support?</p> <p>1.8 What is an effective implementation strategy in proposing important roles to support the implementation?</p> <p>1.9 What is an effective implementation strategy in addressing negative implications on students in using mobile phones in education?</p>	<p>1.10 What is an effective implementation strategy in obtaining funding for the implementation?</p> <p>1.11 What is an effective implementation strategy in enabling students acquiring mobile phones to be used in the implementation?</p> <p>1.12 What is an effective implementation strategy in managing and maintaining the devices in the implementation?</p>

Figure 2: Research question 1 and the sub-question

The second research question explored in this study aimed to establish the potential of mobile learning via mobile phones to complement the existing practices in Malaysian schools. This research question is explored during the dissemination and distribution, the final stage in Educational Research and Development (ER&D) methodology applied in the study. The research question is:

**How can mobile learning complement the existing practices in Malaysian secondary schools?**

To answer this research question, four concepts are explored: English Language subject support; ICT policy; Malaysian Smart School vision; and alternative technology. These concepts become the basis of the research sub-questions:

Research Question 2: How can mobile learning complement the existing practices in Malaysian secondary schools?			
 English Language subject support	 Malaysian school's ICT policy	 Malaysian Smart School's vision	 Alternative teaching and learning
2.1 How can mobile learning add value to the existing initiatives in Malaysian schools in improving students command in English Language subject?	2.2 How can mobile learning complement the policy in Malaysian Educational System to deploy ICT?	2.3 How can mobile learning complement the Malaysian Smart School's vision to deploy mobile technologies?	2.4 How can mobile learning become an alternative teaching and learning tool?

Figure 3: Research question 2 and the sub-questions

Finally, this study also explores emerging themes in the implementation of mobile learning in schools. The emerging themes are raised by the respondents in the preliminary field tests conducted in the United Kingdom, the main field tests in Malaysia and the dissemination and distribution in Malaysia.

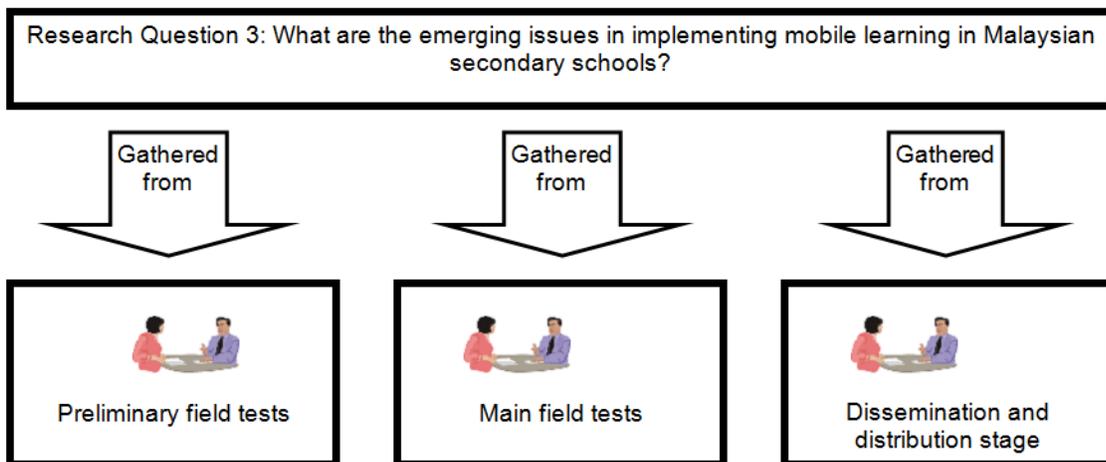


Figure 4: Research question 3

### Significance of the study

This study applies a two-pronged approach to contribute towards the body of knowledge in the mobile learning area in Malaysia. The study not only develops an implementation strategy to utilise mobile learning in Malaysian secondary schools but also adds value in understanding the situation regarding mobile learning in Malaysia.

The study assists the Centre of Curriculum Development, Malaysia and the Educational Technology Division, Ministry of Education, Malaysia in introducing mobile phones as an alternative tool for teaching and learning. As there is no guidance to implement mobile learning in Malaysian secondary schools, this study could be considered a groundbreaking attempt to provide the information. It is envisaged that the implementation strategy would have the potential to be used in the implementation of mobile learning in the future.

Moreover, this study also explores the emerging themes regarding the implementation of mobile learning in Malaysian secondary schools. The potential of mobile phones to complement the existing practices in Malaysian secondary schools is also explored. These are significant themes which must be explored to shed light on the issues associated with mobile phones utilisation in Malaysian schools.

### **List of definitions**

This section defines the key concepts and technologies referred to in this study. These are mobile learning, mobile phones, Short Message Service (SMS), Information Communication Technology (ICT), implementation strategy, and policy and procedure. While some of the definitions are based on the literature, others are developed on the basis of the study's context.

#### ***Mobile learning***

The definitions of mobile learning refer to various contexts. There are definitions of mobile learning which relate mobile learning to e-learning. For instance, Quinn (2000) referred to mobile learning as the intersection of mobile computing and e-learning. This is similar to the definition by Georgiev *et al.* (2004) who stated that mobile learning is a subset of e-learning. In addition, some scholars also relate mobile learning to learning activities or to the use of learning technologies which are location-independent. For example, O'Malley *et al.* (2003) defined mobile learning as "any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies". This is the term that is deployed throughout this research. In this study, mobile learning refers to the use of

mobile phones, a mobile device which supports learning activities regardless of time and place.

### ***Mobile phones***

The term mobile phones refer to the pocket-sized devices which connect people to the digital world (The Horizon Report, 2007). Mobile phones are also defined as highly portable, personal, available anywhere and unobtrusive (Dimakopoulus and Magoulas, 2009). Mobile phones are also known as cell phones because they are associated with the use of cellular technology (Quinn, 2011). The ubiquity of mobile phones, combined with their many capabilities, makes them an ideal platform for educational content and activities (The Horizon Report, 2007). In this study, it is proposed to use mobile phones to support English Language vocabulary learning.

### ***Short Message Service (SMS)***

The term Short Message Service (SMS) which is used in this study refers to a part of the Global System for Mobile Communications (GSM) which allows mobile systems and other network-connected devices to exchange short text messages with a maximum length of 160 characters (Kadirire, 2009). In this study, it is proposed to deliver English vocabulary learning via SMS.

### ***Information Communication Technology (ICT)***

As defined by Meleiseia *et al.* (2007), Information Communication Technology (ICT) refers to the system of technologies, tools and devices that are used to transmit, process, store, create, display, share or exchange information by electronic means. In this study, mobile phones, which are proposed for mobile learning implementation in Malaysia, are considered part of Information Communication Technology (ICT).

### ***Implementation Strategy***

The term 'implementation strategy' has been specifically developed for this study. It refers to the strategy or approach which is proposed as guidance to support the implementation of mobile learning in Malaysian schools. This includes proposing the structure of the mobile lessons, facilities to support mobile learning, the

ownership model, Acceptable Use Policy (AUP), management and maintenance, specific role allocation and support for major stakeholders.

### ***Policy and procedure***

The term 'policy and procedure' have been used in the implementation strategy developed in the study. According to the Consortium for School Networking Initiative (COSN), policies are principles or rules that are intended to shape decisions and actions which provide the framework for the functioning of the organisation. On the other hand, the Consortium for School Networking Initiative (COSN) referred to procedures as the ways in which organisations implement policies. Quinn (2011) stressed the importance of policies and procedures for managing mobile learning programmes. Policies are required to handle problems while procedures are required to execute the programmes. In this study, policies and procedures are established to support the implementation strategy in utilising mobile learning in Malaysian schools.

### **Summary**

This chapter establishes the overview of the study. These are introduction, statement of the problem, purpose of the study, research questions, significance of the study and list of definitions. Having provided the overview of the study, the following chapters are intended to describe the details of the study. This will include:

**Chapter 2:** A review of relevant literature in the field. It consists of four major parts which is included to gain an overview of related studies in the areas of mobile learning, second language learning including the area of vocabulary acquisition, the key knowledge and the practical issues of implementing mobile learning in mainstream schooling.

The first part of the literature review focuses on the exploration of the opportunities to implement mobile learning via mobile phones in English Language learning in Malaysian secondary schools. This is important to gain an overview of the potential to utilise mobile phones to support English vocabulary acquisition in Malaysian schools. It aims to identify:

- The significance of utilising mobile phones in mainstream schooling;
- The significance of utilising mobile phones in Malaysian schools; adding value to improve the command of the English Language, providing alternative teaching and learning tool and complementing the government vision.

Having explored the opportunities, the second part of the literature review seeks to identify the challenges in implementing mobile learning in Malaysia. This is important to gain an overview of the issues which need to be addressed in utilising mobile phones in English vocabulary acquisition in Malaysian schools. It aims to identify:

- The challenges of utilising mobile phones in mainstream schooling and the way to address the issues: classroom management, cyber bullying, health, communication, domestic issues, damage, lost, theft, students' social reality and pedagogical issues;
- The challenges and issues in utilising mobile phones in Malaysian schools and the way to address the challenges.

As the study introduces the use of mobile phones to support English vocabulary acquisition, it is also important to explore the theoretical background related to mobile learning; to be more specific, the ones relating to learning theories, second language learning theories and vocabulary acquisition. In the third part of the literature review, the major theories are examined and the justification is made for the theories that were chosen to underpin the study. In addition, the literature review also provides examples of the existing projects in the development of mobile application for vocabulary learning which is related to the theory underpinned in the study.

The final part of the literature review focuses on the basis of the development of the implementation strategy to utilise mobile learning in Malaysian schools. This is important to explore the key knowledge and practical issues in implementing mobile learning in Malaysian secondary schools. It aims to identify:

- The basis of the content and structure of the mobile lessons to support vocabulary acquisition;
- The basis of the provision of the facilities in supporting mobile learning implementation;
- The basis of the strategy in supporting students to acquire mobile devices;
- The basis of the policies and procedures to guide students in using mobile devices;
- The basis of the strategy to manage and maintain the devices in the implementation;
- The basis of the provision of the role of technical support, maintenance assistants and English subject leaders in supporting mobile learning implementation;
- The basis of the strategy to support major stakeholders; students, teachers and parents.

**Chapter 3:** A description of the research methodology which underpinned the study. The chapter begins with the overview of the study, followed by an exploration of previous studies which applied the methodology, justification of applying the methodology, research design and implementation.

**Chapter 4:** Detailed findings of the study. There are four sub chapters which are dedicated to presenting the findings. The sub-chapters include; Evaluation of the implementation strategy: preliminary field tests, Evaluation of the implementation strategy: main field tests, Dissemination and distribution of the implementation strategy and Emerging themes in the implementation of mobile learning.

**Chapter 5:** Discussion of the findings with respect to the research questions and draws the conclusion to the study. It also highlights the scope and limitation of the study and consideration of the implications of the study. It also provides recommendation for future study.



## Chapter 2: Literature review

In order to gain an overview of the key knowledge related to the areas of mobile learning, second language learning especially the area of vocabulary acquisition and the practical issues of implementing mobile learning in mainstream schooling, a review of the literature was carried out. The literature search focused primarily on four key areas:

- The significance of utilising mobile phones in mainstream schooling generally and in Malaysian schools specifically;
- The challenges of utilising mobile phones in mainstream schooling generally and in Malaysian schools specifically, and the way to address the issues;
- The theoretical background related to mobile learning; to be more specific, the ones relating to learning theories, second language learning theories and vocabulary acquisition;
- The key knowledge and practical issues in implementing mobile learning in Malaysian secondary schools which is the basis of the development of the implementation strategy as proposed in the study.

Each section are interrelated with each other; they represent the main topics which are related to the implementation of mobile learning in Malaysian schools. It is important to gain an overview of the potential to utilise mobile phones to support English vocabulary acquisition in Malaysian schools. It is also important to gain an overview of the issues which need to be addressed in utilising mobile phones in Malaysian schools. As the study introduces the use of mobile phones to support English vocabulary acquisition, it is also important to explore the theoretical and background related to learning theories, second language learning theories and vocabulary acquisition. Finally, as the basis in the development of the implementation strategy to utilise mobile learning in Malaysian schools, there is also a need to explore the key knowledge and practical issues which relate to the policy, procedure and the management of mobile learning.

## **Mobile phones in Malaysian schools: opportunities**

This section begins with a discussion on the significance of utilising mobile phones in education. It explores the benefits of using mobile phones to support mainstream schooling. The keywords are mobility, bite-sized lesson, digital literacy, motivation, affordability, personalisation, drill and practice, interactive learning and independent learning. The affordances of mobile phones have encouraged some schools to utilise this device in teaching and learning. In Malaysia, there is a potential to harness this device. One school has started a trial project of using mobile phones. In addition, scholars in Malaysia have been optimistic about the potential of this device.

This section also explores the potential of using mobile phones to add value to the existing initiatives in improving English Language performance among Malaysian students. The Malaysian government has made various efforts to address the issues of English Language teaching in schools. In addition to deploying ICT in teaching and learning, the government has also introduced the English for Teaching Mathematics and Science (ETEMS) programme and the Upholding Bahasa Malaysia, Strengthening English (UBMSE) programme to support students. Mobile phones have the prospect of supporting the subject of English Language and would bring added value to these programmes.

A section is also included to discuss the prospect of utilising mobile phones as an alternative teaching and learning tool in Malaysian schools. It has been a challenge to provide computer facilities in Malaysian schools. However, statistics have shown that mobile phones have become a common tool among Malaysians. Therefore, it is worthwhile embracing these devices as an alternative tool in mainstream schooling in Malaysia.

The final section addresses the potential of using mobile phones to complement the Malaysian government's vision. The Malaysian government has introduced a policy to encourage the use of ICT as a teaching and learning tool. As mobile phones come under the umbrella of ICT, it might be appropriate to embrace this device to support teaching and learning as well as to increase the proportion of students

learning with ICT. The Malaysian government has also launched the Malaysian Smart Schools programme which supports the use of technology as the key enabler for teaching and learning. These schools have the vision to deploy mobile technologies in the future. This would be an opportunity to explore mobile phones in these schools.

### **Mobile phones in mainstream education: the significance**

In recent years, there has been an increasing interest in mobile learning. The devices used in mobile learning vary, from big devices such as net books, notebooks and laptops to small devices such as mobile phones. However, there are negative perceptions of the use of mobile phones in mainstream education; for example, mobile phones are seen as a source of distraction, delinquency and chicanery (Smith *et al.*, 2005; Trotter, 2001; Vahey and Crawford, 2002; Katz, 2005; Shaw, 2005). These are discussed in the next section, Mobile phones in Malaysian schools: challenges. Nevertheless, The Horizon Report stated that:

Mobile phones also make a reappearance, in the same horizon as last year but nonetheless a year closer..... Clearly, the use of the mobile phone as an educational tool is becoming more widespread and accepted. (The Horizon Report, 2007, p. 7)

In 2010, The Horizon Report highlighted the prospect of deploying smart phones in education (The Horizon Report, 2010). Both literatures appear to stress the potential of using mobile phones in teaching and learning. The reason could be based on the affordances of mobile phones itself. Firstly, it appears that the main motivation for the deployment of mobile phones is mobility. With mobile phones, students can access their lessons almost anywhere and at any time (Quinn, 2000; Mellow, 2005). An alternative explanation is that they are compact and can be transported with ease, thus enabling learning on the go.

The application of bite-sized lessons through mobile phones may also be suitable to fit in with the students' schedule. Bite-sized lessons, as defined by Mellow (2005), are the result of breaking down large and more complex teaching materials into smaller chunks. Mobile phones could support learning by providing learners

with bite-sized lessons that they can learn in shorter periods (Kenning, 2008). For example, while travelling on the bus, students might be able to access notes through mobile phones. There would be less need for students to depend on desktop computers to study.

Mobile phones through SMS technology could also provide an alternative to traditional learning tools such as flash cards. A study by Basoglu and Akdemir (2010) established that using vocabulary learning programs on mobile phones through SMS technology is more effective than using flashcards. The study implies that mobile phones offer accessibility and portability, thus this could support students to conduct engaging learning activities anytime and anywhere.

Mobile phones also have the potential to be used in promoting digital literacy. According to Hague and Williamson (2009), digital literacy is defined as “the functional skills required in operating and communicating with technology and media”. Vavoula *et al.* (2009) highlighted the invaluable resources provided by mobile technology that will become transferable skills in students’ future career. As stressed by Hague and Williamson (2009b), digital literacy is crucial for school children in preparing them to survive in their society. Based on these literatures, it is worth noting that school children ought to be familiar with technology including mobile phones to promote digital literacy, through the utilisation in educational activities. This may include the school children in Malaysia because students and teachers are expected “to keep abreast” of the latest technology as highlighted by the former Minister of Education, Datuk Seri Hishammuddin Hussein (Goh and Aris, 2007). Through the use of mobile phones, it could eventually prepare students with digital literacy, which apparently need to be acquired.

Mobile phones could also motivate students to learn. Kolb (2008) and Saran and Seferoglu (2010) believed that mobile phones, which are popular among students, are motivational tools to be used in education. Various learning activities conducted with mobile phones have shown positive outcomes (Kolb, 2008). These could be seen as an indicator that the utilisation of mobile phones in teaching and learning would be an effective approach in overcoming the difficulties faced by teachers and parents in motivating students.

Furthermore, Williams (2006) highlighted that mobile phones are affordable tools for teaching and learning. He pointed out that the mobile phone is a sensible choice for educational investment. Hirsh (2005) stated that “As a start, consider the use of student-based technology to be a transformer you can put in place quickly at minimal cost”. In addition, Motlik (2008) also stressed that mobile phones are beneficial for both instructors and learners in developing countries because they represent a cost-efficient method. This shows that the use of mobile phones in education might also be relevant for developing countries, where mobile phones are perceived as affordable devices. Mobile phones are relatively low-cost and accessible in low-income communities, thereby could have a positive impact in developing countries, including Malaysia. Abdullah and Siraj (2009) emphasised the potential of using mobile phones for mobile learning in Malaysia because of the affordability of these devices. It can be stated that compared to the cost of equipping school children with desktops, it would be more affordable to purchase mobile phones. For example, in Malaysia, about RM1500 (equivalent to £300) is required to purchase a desktop computer, while only RM200 (equivalent to £40) is required to purchase a simple type of mobile phone. In the future, when smartphone prices become more affordable, it might be appropriate to consider using these devices, with their advanced functions.

There might also be an opportunity to leverage technologies that students own, such as mobile phones. This is evidenced by the literatures from Naismith et al. (2004) and Mellow (2005) that SMS technology offers a push system in the delivery of learning materials. A push system as defined by Naismith *et al.* (2004) and Mellow (2005) is where, through SMS technology, a moderator pushes out mobile lessons to students as reminders to revise. Push system through mobile phones could be seen has the potential to encourage students to set aside regular study times, especially those students who lack motivation to learn, are not organised or have conflicting pressures.

SMS technology also has the potential to be a medium for repetition or drill and practice. Levy and Kennedy justified the affordances of mobile phones in supporting repetition:

Repetitions undertaken across a period, usually at ever-increasing intervals, are a more effective way to learn and retain new words than sustained repetition during a single, continuous period. SMS messages sent at intervals via a mobile phone have a potential to meet this requirement, as well. (Levy and Kennedy, 2005, p. 76)

A statement by Epic Group plc's M-learning also support this opinion:

Repetition is... the most powerful of learning factors. And by spacing that repetition over time you significantly minimise that forgetting. This may be the primary reason for considering m-learning. At last we have the means to deliver content, participation and regular reinforcement to learners whatever they want, wherever they are and whenever they want it. (Dawson, 2007, p. 7)

The previous statements imply the affordances of SMS technology in supporting repetition through drill and practice activities. One of the practical implications is that the use of drill and practice through SMS technology can be seen as beneficial for students in preparing for examinations.

A report by Shuler (2009) stresses the affordances of mobile phones in supporting personalised learning experience. This is one of the features that mobile phones could support, to which Shuler referred as "supporting differentiated, autonomous, and individualised learning through mobile devices". In light of the report, it can be understood that not all learners are alike; therefore, the lessons should be customised according to students' level of performance. As with other educational technology, mobile lessons through mobile phones could also be tailored to support personalisation.

Another advantage of the use of mobile phones in education is that students are able to receive immediate feedback. The benefit of immediate feedback for independent learning has been stressed by Savill-Smith *et al.* (2006), where through SMS quizzes, students would become more autonomous in learning. Reflecting on the literature, there is a practical implication of using SMS; it could

provide a mechanism for immediate feedback, which could encourage students to become independent learners because they would be able to conduct learning activities without over depending on the teachers.

However, it might be considered controversial to suggest the use of mobile phones to support teaching and learning because of the negative perceptions of these devices. Nevertheless, the numerous benefits of using mobile phones for educational purposes might outweigh the negative perceptions. The above paragraphs justified the reasons for utilising mobile phones in Malaysian schools. The keywords regarding the advantages of mobile phones include: mobility, bite-sized lessons, digital literacy, motivation, affordability, personalisation, drill and practice, interactive learning and independent learning.

With all the benefits brought by mobile phones, Prensky raised a well-thought-out question:

So, rather than fight the trend of kids coming to school carrying their own powerful learning devices—which they have already paid for—why not use the opportunity to their educational advantage? (Prensky, 2005)

Brooks-Young (2010) and Hartnell-Young (2005) also has the same perspective on the significance of utilising mobile phones as an educational device. In addition, Snider (2008) and Mellow (2005) stressed the importance of viewing mobile phones as tools rather than toys and believed that it would be possible to introduce engaging and instructive classroom activities with mobile phones.

The above opinions imply the argument for the discouragement in the use of mobile phones and the significance of embracing mobile phones in teaching and learning. Whether or not mobile phones are to bring impact in education, in Malaysia, although the use of mobile phones in education is still in its infancy, there is a prediction that mobile phones or smart phones will be used in secondary schools in Malaysia at some point between 2016 and 2020 as highlighted by Siraj and Saleh (2003). A study by Abdullah and Siraj (2010c) found that, through SMS technology, mobile phones have become the preferred mode of learning to be applied in the m-

learning curriculum in Malaysian secondary schools. In addition, Siraj and Ali (2008) stressed the affordances of mobile phones to support home-schooling, believing them to be cost effective in providing education to students in Malaysia. A study by Mohd Nordin *et al.* (2010) also revealed that the in-service school administrators believed that mobile phones have the potential to be used in teaching and learning in Malaysian schools. Furthermore, Dr Norrizan Razali, Senior Manager of Smart School Department, Multimedia Development Corporation in Malaysia was also positive about the future of smart phones in Malaysian schools (UNESCO, 2010). As the result of the previous review, it has become clearer that mobile phones is becoming more prominent in Malaysia. These suggest a promising future of mobile phones in mainstream schooling in Malaysia.

There have also been an increasing number of research projects exploring the affordances of mobile phones to support mainstream schooling in Malaysia. A study exploring the use of mobile phones to support the teaching of Mathematics in primary schools showed a significant contribution towards students' learning activities (Mahamad *et al.*, 2010). Other initiatives include the development of a collaborative mobile learning module for science subjects in Malaysian secondary schools (DeWitt and Siraj, 2010), a mobile application to support the teaching of English grammar (Sim, 2004) and a mobile application to support the teaching of Malay idioms (Salam *et al.*, 2008). What is apparent from these projects is that they are the evidence of the Malaysian people's expertise in mobile learning which could contribute towards the potential of utilising mobile phones in Malaysia.

In a wider setting, there are several trials in deploying mobile phones in mainstream schooling. Learning2Go is a project based in a number of schools in Wolverhampton, United Kingdom which recognised mobile phones as an effective learning aid (Learning2Go Official Website). In Malaysia, a school known as Cempaka International Ladies' College or Sekolah Cempaka, which is located in Kuala Lumpur, pioneered a trial programme using mobile phones in educational activities (Utusan Malaysia, 2009a). In addition to these trial efforts, some schools have utilised mobile phones in teaching and learning. An example is Notre Dame High School in Sheffield, United Kingdom (Telegraph, 2009). As a preparation for

the implementation, the school developed a policy so that mobile phones can be used productively in teaching and learning (TES Magazine, 2010). In New Zealand, Otumoetai Intermediate School is one of the pioneers in the deployment of mobile phones as a learning tool (Bay of Plenty Times, 2010). In the United States of America, Wiregrass Ranch High School is one of several schools utilising mobile phones for educational purposes (St. Petersburg Times, 2009). As apparent from this paragraph, the case studies show that there are schools which are optimistic about the use of mobile phones in mainstream schooling, including the school in Malaysia. This could be another positive indicator of the potential of using mobile phones in schools.

This subsection discusses the significance of utilising mobile phones in education. It has highlighted the benefits of deploying mobile phones in mainstream schooling. There are many convincing reasons to integrate mobile phones in Malaysian schools. The keywords are mobility, bite-sized lessons, motivation, affordability, personalisation, drill and practice, interactive learning and independent learning. In addition to a trial project in using mobile phones, Malaysian scholars were also optimistic about the potential of this device and has the expertise in the area. Therefore, it is time to embrace the benefits offered by mobile phones in mainstream education. Mobile phones also have the potential for use in support of the English Language subject in Malaysia. The next subsection continues to explore the affordances of mobile phones to support the English Language subject in Malaysian schools.

### **Mobile phones in the English Language subject: added value**

The issue of English Language competency among Malaysian students has been a concern for many years. What is apparent is that although students have been exposed to the English Language subject in schools, the issue of English Language proficiency persists. Based on the researcher's experience of having an early education in the Malaysian educational system, students in Malaysia learn the English Language for eleven years at school. This includes six years in primary school, from Year 1 to Year 6, and five years in secondary school, from Form 1 to Form 5. The following table summarises the subjects offered in primary school and secondary school in Malaysia, including the English Language subject.

Primary school	Subject	
Year 1 to Year 3	Malay Language <b>English Language</b> Mathematics Islamic Education (for Muslims) Moral Education (for non-Muslims)	Music Art Education Health Education Physical Education
Year 4 to Year 6	All of the above Science Local Studies Living Skills	
Public Examination: Ujian Penilaian Sekolah Rendah (UPSR) or also known as The Primary School Assessment Test (End of KS1)		

Secondary school	Subject	
Form 1 to Form 3	Malay Language <b>English Language</b> Science Mathematics History Islamic Education (for Muslims) Moral Education (for non-Muslims)	Health Education Living Skills Physical Education Art/Music Education Other languages (optional) Geography
Public Examination: Peperiksaan Menengah Rendah (PMR) or also known as Lower Secondary Examination (End of KS3)		
Form 4 to Form 5	Compulsory subjects:  Malay Language <b>English Language</b> Modern Mathematics Islamic Education (for Muslims) Moral Education (for non-Muslims) History Physical Education Health Education	Electives (according to streams):  Pure Science subjects Additional Science Islamic Studies subjects Applied Arts subjects Information Technology Languages Technology subjects Humanities subjects
Public Examination: Peperiksaan Menengah Rendah (PMR) or also known as Lower Secondary Examination (GSCE Equivalent)		

**Table 1: Subjects in primary and secondary schools in Malaysia (Bakar, 2006; Ministry of Education Malaysia's Official Portal)**

However, there is an issue with regard to the poor performance in English Language. It has been reported that in most cases, students have poor reading comprehension and academic writing skills (Samuel and Abu Bakar, 2008; Samuel and Abu Bakar, 2007; Sarudin and Zubairy, 2008). Moreover, in a major examination, students' performance in English Language also declined (News Straits Times, 2009; Berita Harian, 2011). It is likewise depressing that in a report by the leading Asia-Pacific Internet recruitment company, JobStreet.com, indicated

that the main reason employers in Malaysia do not hire new graduates is their weakness in the English Language (Samuel and Abu Bakar, 2007). Findings from a study conducted by the Economic Planning Unit of the Prime Minister's Department revealed that 60,000 Malaysian graduates are unemployed because of their poor command of the English Language (Samuel and Abu Bakar, 2008). This appears to bring an implication for students; it might not only affect students' academic achievements but it might also have an impact on their future careers.

This situation leads to a question about the effectiveness of the educational system in Malaysia. It seems that even though students have been exposed to the English Language for many years at school, their performance in English Language is still unsatisfactory. Giridharan and Enriquez believed that the language used for delivering subject matter in Malaysian schools, which is the Malay Language might have an impact on the students' performance in English Language (Giridharan and Enriquez, 2002)

Thus, in an effort to familiarise students with the English language, the Ministry of Education, Malaysia introduced the English for Teaching Mathematics and Science (ETEMS) programme to encourage the use of the English language in teaching Mathematics and Science subjects (English for Teaching Mathematics and Science (ETEMS) Official Portal). However, this programme could be seen failed to improve the command of English among students. The effectiveness of the programme could be challenged on the students' achievement in Mathematics and Science. An explanation for the failure could be that students who were weak in the English Language were affected because they could not understand the subjects delivered in the English language. This has resulted in a plan to abolish this programme in 2012 (Utusan Malaysia, 2009b). However, in preparing for the transition, the programme is projected to be continued until 2014 (Utusan Malaysia, 2009c).

As an alternative, the Ministry of Education, Malaysia has introduced a programme known as Upholding Bahasa Malaysia, Strengthening English (Ministry of Education Malaysia, 2009; The Star Online, 2010). Under this programme, the Ministry of Education applies a two-pronged approach. This programme could be seen as it may not only enhance students' proficiency in Bahasa Malaysia as their

mother tongue, but perhaps it may also improve their proficiency in English Language.

The teaching and learning of English Language in Malaysian schools also utilise ICT. The use of browser-based teaching is an example of the ICT deployment (Ismail, 2003; Chan, 2002; Muhammad *et al.*, 2004). In addition, courseware is also used in English teaching and learning (Samuel and Abu Bakar, 2007; Abdullah *et al.*, 2006; Cloke and Sharif, 2001). English lessons are also made available through websites (Bajunid, 2001; Idrus and Atan, 2004; Chan, 2002). Educational content to support English subjects are also broadcast through Educational TV (ETV) (Abdullah, 2006). The latest ICT application for the English Language subject is EduWebTV where students can watch on-demand video streaming of educational content (EDuWebTV Official Website). In addition, several portals have been developed by private institutions: Portal Kakak Tua, Epelajar, CikguNet, getcyberEd, my schoolnet and Portal Pendidikan Utusan (Siraj, 2004).

It can be seen that the Ministry of Education has been given much concentration in the English Language subject. Nevertheless, to support the initiatives in improving English, it is also worthwhile embracing the affordances of mobile phones. It is clear from the previous review that there are various advantages of using mobile phones for English subjects (Dawson, 1007; Quinn, 2000; Mellow, 2005; Kenning, 2008; Naismith *et al.*, 2004; Savill-Smith *et al.*, 2006). The main advantage of mobile phones in learning English is their ability to support drill and practice. Through mobile phones, SMS technology could be exploited to support students in practising English. Another motivation for the deployment of mobile phones is their mobility. Mobile phones are compact and would enable students to access their lessons regardless of time and place. Mobile phones could also assist English Language learning through bite-sized lessons that learners could access in limited periods of time. Through SMS technology, mobile lessons could be scheduled for regular delivery. This would be beneficial for students who lack the motivation to learn. Mobile lessons could also be used as the new version of flashcards which would engage students in learning English. Finally, mobile phones would also enable students to receive immediate feedback. Through SMS technology,

students would be able to receive answers immediately, which would help them to become autonomous learners in learning English.

This section discusses the various initiatives in improving students' command of the English Language. Through ICT, English Language lessons are made available in browser-based applications, courseware, websites and learning portals. The government also has introduced additional programmes such as English for Teaching Mathematics and Science (ETEMS) and Upholding Bahasa Malaysia, Strengthening English (UBMSE). As an addition to these initiatives, mobile phones could be used to support English Language learning. Moreover, mobile phones might also have the potential to be used as an alternative teaching and learning tool for other subjects. The next subsection continues with a discussion of the use of mobile phones as an alternative tool in Malaysian schools.

### **Mobile phones in Malaysian schools: alternative technology**

The Malaysian government has provided various ICT applications such as browser-based teaching, courseware, websites and learning portals. On the researcher's point of view, providing sufficient computer facilities is important to enable students to use these applications. However, it might be a challenge to provide computer facilities for all schools because it may need a great amount of funding. Ramlan (2002) highlighted that it has been a challenge to equip the schools with sufficient computer facilities. As stated in Educational Technology Division Malaysia's Official Portal, the government requires RM642, 000 (equivalent to £128, 400) to provide computer lab facilities to just one school. In addition, Wan Ali *et al.* (2009) reported that RM 1.2 billion which is equivalent to 600 million is allocated for upgrading all the schools in the country.

It might be argued, however, that even though the government has invested billions of Malaysian Ringgit, some schools still have inadequate computer facilities as highlighted by Ministry of Education Malaysia (2008). Besides, it is questionable whether all schools can be equipped with computer facilities because in some areas there are limited access to main electricity supplies as stated by Ministry of Education Malaysia (2008). Perhaps, a proposal by Siraj (2004), a Malaysian scholar, to utilise mobile learning could be the solution to this issue.

Hence, it is worthwhile for the Ministry of Education, Malaysia to consider a viable alternative, which is the use of mobile phones. It appears that mobile phones are becoming increasingly common in Malaysia. Statistics show that mobile phones have successfully penetrated the electronic devices market in Malaysia. The Economic and Social Survey of Asia and the Pacific indicated that Malaysia represents the same penetration rate as in the developed countries such as Japan (UNESCAP, 2007). Malaysia also compares favourably with the United States (Chafe, 2008). In addition, Fong *et al.* (2008) stated that there were 22.1 million subscriptions to cellular mobile services in Malaysia out of its population. A recent survey conducted by the Malaysian Communication and Multimedia Commissions indicated that the penetration rate had reached 110.6% (Malaysian Communications and Multimedia Commission, 2010).

In a study conducted by the Open University Malaysia, Malaysian students valued mobile phones as a sensible option for mobile learning (Yusoff *et al.*, 2008). Findings from studies conducted by Universiti Technical Malaysia and Multimedia University Malaysia also suggest that university students have a positive attitude towards learning via mobile phones (Hashim *et al.*, 2008; Hassan and Sethuramagalingam, 2004). At school level, students also showed a positive attitude towards mobile learning (Mohamad, 2007; Mahadi, 2005).

High penetration of mobile phones, together with positive attitudes towards mobile learning, could be regarded as a positive sign that Malaysia has the potential to implement mobile learning in its educational system. This runs parallel to the opinion of Abdullah and Siraj (2010a), the Malaysian scholars, who implied that the proliferation of mobile phones and the students' attitude could be the main driving contributing factor to the future of mobile learning.

Therefore, it is believed that mobile learning through mobile phones would have the potential to be used as an alternative teaching and learning tool in Malaysian schools. As demonstrated by the statistics, mobile phone is a tool owned by the majority of people in Malaysia. This is a positive indicator for the Ministry of Education, Malaysia to consider an alternative teaching and learning tool, such as mobile phones. Moreover, mobile phones might also have the potential to

complement the government's vision of embracing ICT and mobile technology. The next subsection continues with a discussion of the opportunities.

### **Mobile learning in Malaysian schools: complementing the government's vision**

It appears that the implementation of mobile learning for English Language learning would complement the government's vision. Firstly, there might be a possibility of complementing Malaysian schools' ICT policy through the use of mobile phones. In an effort to enhance students' learning as well as to reduce the digital divide among schools, the Ministry of Education, Malaysia has introduced a policy to deploy ICT in schools:

ICT provided to all students as an enabler to reduce the digital gap between schools, ICT in education as a teaching and learning tool, as part of a subject and as a subject itself and using ICT to increase productivity, efficiency and effectiveness of the management system. (Ismail, 2008, p. 1)

In line with the government vision as stated above, the use of ICT is encouraged in teaching and learning in schools. The Ministry of Education, Malaysia has been equipping schools with ICT. Under the ninth Malaysian Plan, about RM2.1 billion (about USD 600 million) has been allocated for upgrading all schools in the country (Wan Ali *et al.*, 2009). According to Meleiseia *et al.* (2007), mobile phones come under the umbrella of ICT. Previously, television, another ICT device, has been deployed in Malaysian schools (Abdullah, 2006). Mahamad *et al.* (2010) believed that it is appropriate to embrace the use of mobile phones in Malaysian schools because it could increase the student's computer access ratio. Therefore, it might be appropriate to conclude that there is a potential to utilise mobile phones as another ICT tool to support teaching and learning in Malaysian schools.

The use of mobile phones in Malaysian secondary schools might also complement the vision of Malaysian Smart Schools. The Malaysian Smart School is defined as follows:

The Malaysian Smart School is a learning institution that has been systematically reinvented in terms of teaching-learning practices and school management in order to prepare children for the Information Age. A Smart School will evolve over time, continuously developing its professional staff, its educational resources, and its administrative capabilities. This will allow the school to adapt to changing conditions, while continuing to prepare students for life in the Information Age. (The Malaysian Smart School Blue Print, 1997, p. 10)

From the vision of the Smart School implementation, mobile technology is a tool that was intended to be used:

Enhancement initiatives can include mobile technologies for teaching-learning purposes, for mobile learning or in common usage, the “wireless” way to learn. A scheme is to be instituted in order to help all children buy an access device for mobile learning for use during the child’s school-going days. This is one of the solutions that schools and parents can consider as part of school governance. (The Smart School, 2005, p. 47)

From the Smart School implementation plan, Wave 4 is associated with a period of consolidation and stabilisation over the decade between 2010 and 2020. It is apparent from the report that technology is expected to become a key enabler in teaching and learning in the future. Mobile learning could become a valuable resource in the realisation of technological integration in Wave 4, as shown in Figure 5.

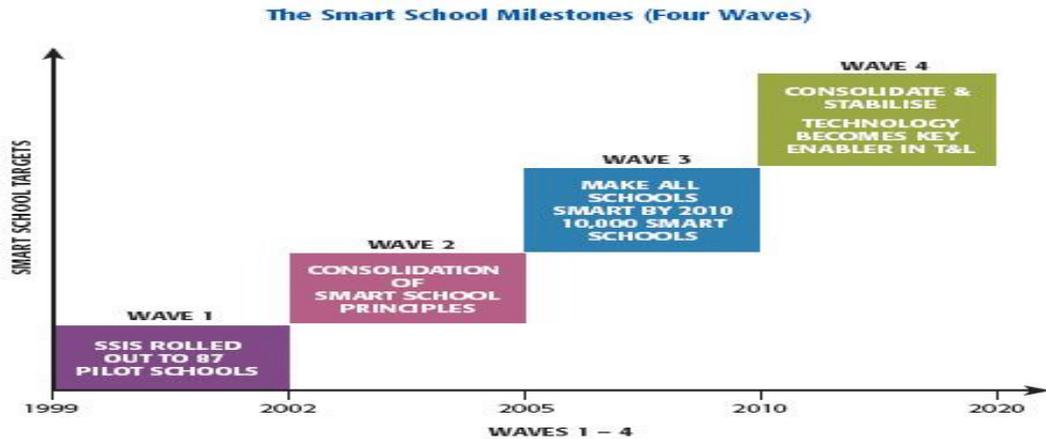


Figure 5: The Smart School milestones-four waves (The Smart School, 2005)

Although, initially, only 93 schools were established as Smart Schools, the government has a vision that all schools in Malaysia will become Smart Schools (Wan Ali *et al.*, 2009). Thus, the aim of complementing the vision of Malaysian Smart Schools would be beneficial not only in Smart Schools, but also for all schools because, eventually, all secondary schools in Malaysia will become Smart Schools.

The review appears to show that there is a potential for mobile phones to complement the government’s vision. The use of mobile phones could support the Malaysian schools’ policy of utilising ICT; it could also support the vision of Malaysian Smart Schools in utilising mobile technology. The next subsection continues with the summary of this section.

### Summary

This section establishes the prospects of using mobile phones as a teaching and learning tool in Malaysian schools. There are numerous benefits in integrating mobile phones for teaching and learning. The advantages include mobility, bite-sized lessons, digital literacy, motivation, affordability, personalisation, drill and practice, interactive learning and independent learning. On the basis of the affordances of mobile phones, some schools have deployed these devices for teaching and learning. This includes a trial project in one school in Malaysia. Moreover, scholars in Malaysia have been optimistic about the potential of these devices to be used in education.

This section also explores the potential of using mobile phones in adding value to the existing initiatives in improving English Language performance among Malaysian students. Even though Malaysian students have been exposed to English Language learning for eleven years at school, their performance in the English Language is unsatisfactory. As a solution to this issue, the Malaysian government has introduced various strategies including English for Teaching Mathematics and Science (ETEMS) programme, Upholding Bahasa Malaysia, Strengthening English (UBMSE) programme, and utilising ICT in English Language teaching and learning. Mobile phones might have the potential to support English Language learning and might bring added value to these initiatives. It has also become the Malaysian government's vision to equip all schools with ICT facilities to support teaching and learning. However, it is a challenge to achieve this vision because of the cost of equipment and electricity supply issues. On the other hand, mobile phones, which are becoming increasingly common in Malaysia, would have the potential to become an alternative tool in mainstream schooling in Malaysia. Moreover, it also appears that mobile phones might complement the Malaysian government's vision in deploying ICT and mobile technologies in mainstream education. The use of mobile phones might increase the students' computer access ratio and could also contribute towards the realisation of mobile technology integration in Malaysian Smart Schools.

This section explores the potential of using mobile phones as teaching and learning tools in Malaysian schools. Mobile phones would have the potential to add value to support English Language learning, provide an alternative tool for teaching and learning in Malaysian schools and complement the Malaysian government's vision of deploying ICT and mobile technologies. The next section continues with the challenges to the implementation of mobile learning in Malaysian schools.

## **Mobile phones in Malaysian schools: challenges**

Having explored the potential of using mobile phones as teaching and learning tools in Malaysian schools, this section continues with the discussion of the challenges in the implementation of mobile learning in Malaysian schools. This section is included in the thesis as an awareness of the challenges in utilising mobile phones in mainstream solution. This section started by exploring the challenges in general before concentrating on the challenges in Malaysian schools. The section also discussed the approach in addressing the challenges.

Mobile phones have the potential to be utilised in teaching and learning. As discussed in previous section, Mobile phones in Malaysian schools: opportunities, mobile phones offer various advantages which could support teaching and learning. The keywords relating to the advantages of these devices are mobility, bite-sized lessons, motivation, affordability, personalisation, drill and practice, interactive learning and independent learning. However, mobile phones also raise various problematic issues, thus explaining why they might not be welcomed by many schools even for use as an educational tool. This section explores these reasons which include classroom management, cyber bullying, health, communication, domestic issues, damage, loss and theft, students' social reality and pedagogical issues.

This section also discusses the approach to address these issues. One of these solutions is to raise student awareness of the negative implications of mobile phones if not used appropriately. The development of an Acceptable Use Policy (AUP) is another strategy in overcoming negative implications of students' use of mobiles. Parents, as major stakeholders, also have the responsibility to educate their children to use mobile phones productively. Other solutions are to establish user responsibilities and to establish device management procedures. Moreover, it is also worthwhile to undertake appropriate approach to address students' social reality issues which include providing support and encouragement for students to raise positive attitude towards the use mobile phones in education. In addition, it is also important to determine where mobile phones fit into the curriculum to address pedagogical issues. Finally, this section closes with a discussion on the challenges faced by Malaysian schools in utilising mobile phones. The appropriate solutions to

resolve these issues are explored. This section identifies the challenges faced by many schools worldwide including Malaysia in utilising mobile phones for teaching and learning. With proper solutions, mobile phones will have the potential to be regarded as an ordinary teaching and learning tool in mainstream education.

### **Mobile phones in mainstream education: challenges and solutions**

The literature has identified many challenges of using mobile phones. The main challenge is to deal with the negative implications of students' use of mobile phones. The major issue in using mobile phones for teaching and learning is that they are regarded as a disruptive technology in schools. The features of mobile phones, which enable students to beam documents and to send text messages, could imply the reasons for issues in the classroom even though they have powerful teaching and learning affordances. These issues are related to cheating by beaming answers during examinations, by sending answers using text messaging and by taking photographs of answers using mobile phones (Smith *et al.*, 2005; Trotter, 2001; Vahey and Crawford, 2002; Katz, 2005; Shaw, 2005; Rosile, 2007; The University of Alabama Computers and Applied Technology Program Official Website; 2006; Bauer and Ulrich, 2002; Clyde, 2004; Tatar *et al.*, 2003). While people are worried about this "disruptive technology", Attewell *et al.* (2009) argue that this is only a myth and the problem is not significant enough to reduce the value of using mobile phones for teaching and learning. Despite of the contradictory opinions, there may be a need to consider appropriate solutions to address these issues.

In addressing classroom issues, the easiest solution would be to deploy mobile phones that do not have beam and camera features. This would prevent students from copying one another's assignments through beaming and cheating during examinations, by sending answers using text messaging (SMS) and by taking photographs of answers using mobile phones. However, because the technology associated with mobile phones will become more advanced in the future, this could not be assumed as a solution to address the issue. In addition, it could not address the issue related to cheating via text messages (SMS) because all mobile phones have a text messaging (SMS) function. Therefore, establishing a code of conduct

for students in using mobile phones for learning or what is also known as an Acceptable Use Policy (AUP) could be the solution (Bonifaz and Zucker, 2004; Smith and Cap, 2008; Vahey and Crawford, 2003; Williams, 2006; Shepparton High School Official Website). An Acceptable Use Policy (AUP) could be used to provide guidelines and rules on the appropriate use of mobile phones and highlight the consequences of violating the rules. This would ensure that students were aware of the proper and improper use of the devices and would prevent them from causing classroom issues. Moreover, this policy would also become valuable for parents in helping to monitor their children (Nielsen and Webb, 2011). Another solution to prevent classroom issues is to introduce learning activities that are unrelated to the use of mobile phones in the classroom, such as field trips and homework assignments (Kolb, 2008). Kolb (2008) suggests various learning activities that do not require the use of mobile phones in the classroom. This could be considered as a temporary solution until schools are confident about the use of mobile phones during school hours.

Another major implication of using mobile phones in mainstream schooling is that they could cause social problems. Hartnell-Young (2008) stated that the mobile phone is regarded as a “potentially offensive weapon”. This refers to the cyber bullying issue which has become a concern in schools, in addition to traditional bullying (Smith *et al.*, 2005; Quinn, 2011). Cyber bullying can be inflicted not only on students but also for teachers, when students send harassing messages to teachers through mobile phones. There have been about 100 cases reported by teachers (BBC, 2007). These literatures show that cyber bullying is a significant issue which need to be addressed in implementing mobile learning. There would be also a need for by private companies and government bodies to deal with this problem, raising awareness of the main stakeholders as highlighted by Tesco Mobile and NCH (2005) and Becta (2005). It would be also beneficial for schools to establish a rule of conduct in the Acceptable Use Policy (AUP) to prevent students from sending malicious messages which could amount to cyber bullying (Hinduja and Patching, 2008). Moreover, parents should also be encouraged to monitor their children’s use of mobile phones (Hinduja and Patching, 2008). These approaches can be seen as helpful and beneficial because it could raise stakeholders’ awareness towards the issue of cyber bullying.

Another concern over the use of mobile phones use is the health issues. Although they may be insignificant, health issues pertaining to the use of mobile phones should not be ignored. One of the issues is the complications ensuing from exposure to electric and magnetic fields (EMF) generated by mobile phones (Pownell and Bailey, 2003). However, as stated by Pownell and Bailey (2003), there are contradictory findings among studies on the impact of EMF on humans. Some studies have found a correlation between exposure to EMF fields and cancer, while others have been inconclusive. Another health issue that should not be ignored is the effect of exposure to a tiny screen for long hours, as this could cause eyestrain (Pownell and Bailey, 2001; Smith and Cap, 2008). Moreover, there are also physical problems related to repetitive use of a keypad, such as hand cramps and carpal tunnel syndrome (Pownell and Bailey, 2001; Smith and Cap, 2008). From this review, although there are contradictory findings about the effect of EMF from mobile phone use, there might be a need for students to be aware of other health issues related to the use of mobile phones. As suggested by Pownell and Bailey (2003), students should be encouraged to have occasional breaks from mobile phones to prevent eyestrain and other physical problems such as hand cramps and carpal tunnel syndrome (Pownell and Bailey, 2003). It may look straightforward, but this solution might be useful because students would be aware of the health implications of mobile phones on them.

In addition to health issues, it appears that there might be a problem related to communication skills. On reflection, people have various options to communicate through technologies such as mobile phones and e-mail. Although these technologies might be essential, especially for long-distance communication, overdependence on them would not be appropriate, especially for children, as they may impact on their skills to communicate in a natural way. From the researcher's experience as an educator, it seems that students are attracted to technology-mediated communication, such as using SMS because young people are particularly interested in technology. However, there might be a concern that when students need to communicate face to face, they might not feel comfortable and confident because they have become accustomed to communicating through technology. The implications for children of communicating through technology are

posited by Thomas Sherman, Virginia Tech professor of education in Science Blog (2002):

When communication is frequently mediated, it is possible children will not learn these subtle aspects of communicating well. Today much communication is mediated with telephones, computer, email, and video. It is appropriate to limit this mediated communication with young children. (Science Blog, 2002)

Another communication issue related to mobile phones concerns students' obsession with SMS language. Mphahlele and Mashamate (2005) define SMS language as a language used among mobile phone users to communicate using symbols and abbreviated forms of words and sentences to economise on space, time and money. Examples of the most popular SMS language abbreviations are as follows:

<b>Word or phrase</b>	<b>Abbreviation(s)</b>
Be right back	Brb
By the way	Btw
For your information	Fyi
Got to go	Gtg
Laugh out loud	Lol
No problem	Np
Oh My God	omg
See you	Cu
Talk to you later	Ttyl

**Table 2: Example of the most common SMS language**

It appears that the implication of SMS language for students is that it might change the way students use formal language. Since using SMS language is simpler than using formal language, students might be inclined to use it in their academic or formal writing. A case where a student used SMS language in an exam was reported by the BBC (2002a, 2003). This news item demonstrated the implications of SMS language for students. It might be reasonable to use this language moderately to save on space, time and money, but using it in academia should be

discouraged. As a solution for communication skill issues, students should be encouraged to use mobile phones sensibly to prevent communication skill issues from developing (Science Blog, 2002). Parents should also have the responsibility of monitoring their children's use of mobile phones (Nielsen and Webb, 2011). Regarding the use of SMS language in academic and formal writing, students ought to be aware that SMS language is inappropriate for use in their future careers (Kolb, 2008). These approaches, according to them, would raise the stakeholders' awareness with regard to the communication issues resulted from the use of mobile phones. It could be the answer in addressing the communication issues.

In addition, without proper monitoring at home, domestic issues might occur. Students might be distracted from learning, instead becoming obsessed with non-educational activities such as playing games (Mifsud, 2002; Mifsud, 2003; Jackson, 2002; Gimbert and Zembal-Saul, 2002; Bauer and Ulrich, 2002). This might also tempt students to use their credit limit unnecessarily, which could also cause problems related to cost (Kolb, 2008). What is apparent from the literatures is that domestic issues might be a challenge in implementing mobile learning and therefore, there is a need to address these issues. An approach might be to encourage students to use mobile phones productively (Kolb, 2008; Bauer and Ulrich, 2002). Parents should also monitor their children's devices to ensure that inappropriate content or applications are not installed or viewed (Nielsen and Webb, 2011). Another solution is to educate students to use their credit limits responsibly (Kolb, 2008). These approaches might be trivial, but they may provide some beneficial effects on stakeholders; it could raise the awareness about the domestic issues.

Since mobile phones are usually small and compact, they are also exposed to damage, loss and theft (Jackson, 2002; Perry, 2003). However, some trial projects which deployed mobile technology in education reported that damage, loss and theft are rare (Cavus and Ibrahim, 2009; Vahey and Crawford, 2003; Hartnell-Young and Heym, 2008; Attewell *et al.*, 2009). On the other hand, when mobile phones were introduced, there were instances of school children who owned mobile phones being robbed and assaulted (BBC, 2002b; BBC, 2007b; BBC, 2002c). However, it seems that these incidents are unlikely to happen nowadays

because most people own mobile phones. Nevertheless, incidents such as damage, loss and theft might impact upon the opinions or perceptions of stakeholders such as teachers and parents. They may become disinclined to accept the idea of using mobile phones in education, and therefore there are some countermeasures that may need to be considered. To deal with the damage, loss and theft issues, there are a number of solutions that ought to be considered. First of all, to prevent damage and loss, there is a need to establish a user responsibility for damage and loss (Pownell and Bailey, 2003). Through this approach, students and parents will become aware of their responsibilities to take proper care of the devices, preventing damage and loss. Another solution that might be considered is to establish an appropriate management procedure, such as using security plates or marks on the devices, keeping an inventory of the devices, using protective cases and purchasing insurance (Williams, 2006; Pownell and Bailey, 2003). To prevent theft, school children should be taught to safeguard their mobile phones (Pownell and Bailey, 2003). It would also be useful to secure mobile phones by determining safe places to store them when not in use (Williams, 2006; Pownell and Bailey, 2003). These are some of the solutions which may bring significant impact in addressing the issue of damage, lost and theft.

In utilising mobile phones for educational purpose, there is a challenge with regard to the resistance towards mobile learning among students (Guy, 2009; Read and Druin, 2009). The challenge could be related to students' social reality; their reaction and attitude towards mobile learning. In a study by Traxler (2008), it has been reported that 78 percent of the students participated in a mobile learning study indicated their interest to use their own device. They also expressed their opposition towards the policies that prevent them from using their own mobile devices for learning. On reflection, the findings are a promising sign that there is an opportunity to use students' own devices in implementing mobile learning. There is a potential to leverage students' own devices in implementing mobile learning, as suggested by Evans and Moss (2010). However, the challenges would be to manage and regulate students own devices. Concerns about privacy may inhibit learners to use their own devices for educational material because they may feel that it is intrusive (Traxler, 2008). As these devices are personal items, there are ethical aspects that need to be addressed in managing and regulating these

devices (Traxler, 2008). For example, it is understandable that learners sometimes need to turn their devices off. If students' own devices are to be used, it is important to ensure that the approach in implementing mobile learning will not invade learners' personal devices and privacy. Some case studies have shown that schools have the role to put appropriate policies and provisions in place in managing student's own device as an educational tool (Project Tomorrow and Blackboard Inc, 2010). In addition, educators also need to be aware of the reduced control they have over the students' devices to ensure students' privacy (Traxler and Wishart, 2011). There is also a need to inform students and parents of the learning purposes for personal devices and encouraged them to be involved in establishing appropriate ownership, management and ethical arrangement (Becta, 2010). These literatures could be seen as having the recommendations to address the issue of using students' own devices. It is worthy of considering the recommendations because they could reduce students' anxiety in using their own devices and raise a sense of belonging to the utilisation of mobile learning which could eventually raise positive attitude.

In numerous projects, students are reported to be enthusiastic in exploring the use of mobile phones in education (Bradley and Holley, 2010). Teachers are also enthusiastic about the use of mobile phones to enable students to study at anytime and anywhere (Stockwell, 2008). However, a case study reported a contradictory situation where learners are reluctant to use mobile phones in a language learning project (Stokewell, 2007). In another case study, it has been reported that students who are from the group of people most likely to use mobile phones rarely use their mobile phones for educational purposes outside the project (Shudong and Higgins, 2006). The finding leads to a question about the learners' stance in using mobile phones for learning. While mobile phones are believed to support learning anytime and anywhere, the reality of it could be argued. For example, it is questionable that how many of the learners would really want to learn on the way back home while they might be tempted to relax. Moreover, there is an argument that simple ownership of a technology and having the skills to use it has no correlation with a learners' willingness to actually use it (Stockwell, 2008). As highlighted by Shudong and Higgins (2006), one of the reasons behind the issue is that habits may take time to change. Attewell *et al.* (2009) agreed with this opinion. An alternative

explanation could be that students have been accustomed with the traditional approach in learning, and therefore it would be challenging to change the existing learning culture and to adapt to a new approach to learning. Another reason as posited by Stockwell (2008), is the issue of anxiety: lack of confidence could be the reason for unwillingness to use mobile phones for learning purpose.

Another issue that has been raised within students' social reality with mobile phones is the issue of novelty. While Perry (2003) believes that using mobile technologies is motivating and engaging, there are concerns from Vavoula *et al.* (2003) that there is a possibility that the novelty would wear off after a certain period. In light of the concerns, it would be possible that over time, students would feel that mobile technologies such as mobile phones are similar to other learning tools that they have been using. There is a possibility that the excitement to use mobile phones would only become as a passing fad. In addressing the issue related to students' attitude, Eicker and Mathee (2008) highlighted the importance to understand that a person's intention to adopt an innovation or technology is influenced by the person's stance towards the innovation. One explanation for this could be that students are likely to embrace mobile phones for learning if they can see the benefit of using it. While Sharples (2006) argued that the choices to utilise mobile learning are depending on individual, Pownell and Bailey (2003) believe that support and encouragement from teachers would encourage students to see the rationale in using mobile phones to support learning activities. This could be a helpful approach in raising students' interest in considering mobile learning; appropriate mind setting is a way to achieve stakeholders' buy-in.

There are also pedagogical challenges in using mobile phones in education. For example, it is necessary to determine where mobile phones fit into the curriculum and which subjects are suitable to deploy mobile phones for teaching and learning (Smith and Cap, 2008). This is because the architecture of the mobile phones itself is small and has text input limitation which could be the barrier in the learning process (Mahammad *et al.*, 2010). It is worth noting that the limitation could be an indicator that not all subjects and learning activities can be conducted via mobile phones. In a literature by Adesope *et al.* (2007), it has been stressed that the

inability to display a large amount of information at once could have an impact on cognition and would slow down the learning process. However, delivering subject material through bite size learning materials could compensate this limitation (Kenning, 2008). Bite size materials as defined by Mellow (2005) are the result of breaking down large and more complex teaching materials into smaller chunks. Although Corbeil and Valdés-Corbeil (2007) question the appropriateness of learning through bite size lessons; where it was believed that the brevity of expression could trump the depth of knowledge, studies by Levy and Kennedy (2005) and Cooney and Keogh (2007) have proved the appropriateness of applying bite size lessons in language learning. Other than applying bite size lesson, it might also useful to develop less demanding tasks in mobile phones and leaves more demanding tasks to the personal computer (Stockwell, 2008). Burston (2011) also suggested that the limitation can be addressed through the use of images and sound and restricting learner text input to clicking options via true and false as well as multiple choice or by dragging objects. These are some of the possible ways which may need to be considered in addressing the pedagogical issues because it could overcome the physical limitation of mobile phones.

Another pedagogical challenge is an absence of learning atmosphere in mobile learning (Shudong and Higgins, 2006). The use of “stolen moments in learning”, for example, while standing in line for the bank or waiting for an appointment as advocated by Metcalfe (2002), might be problematic. There appear to be arguments for the appropriateness of learning while mobile. It is arguable whether the “stolen moments in learning” can lead to deep learning (Rajasingham, 2011). Moreover, it is questionable whether the students would manage to study anytime, anywhere while on the go (Rajasingham, 2011). Traxler (2007) has a concern about this issue and stressed that mobile learning is more than just the use of mobile devices for learning but the ability to learn while mobile. This issue is related to the learner’s surrounding when learning through mobile technologies; including mobile phones (Barker et al., 2005). Perhaps the limitation of learning on the go is to manage the distraction from the surrounding. Despite of this concern, Traxler and Wishart (2011) argued that compared to books or laptops, mobile phones will always be carried by learners which will eventually promote learning. In addition, due to the fact that multitasking is a part of younger students’ abilities (Prensky,

2001), could well be the justification for the arguments. Nevertheless, Thornton (2004) reported that some learners have difficulty in listening to the mobile lessons and need to use headphones while learning in public places. In addition, Burston (2011) also reported that some learners need to find the quiet surroundings to study on the go. Whether or not learning while mobile is appropriate, it would have been better to find ways to address the distraction from the surrounding. In addition to using headphones and finding a conducive surroundings, developing an engaging mobile application is also important so that learners could be diverted from the distraction and could pay attention to the mobile lessons (Barker *et al.*, 2005). Again, as discussed in the previous paragraph, conducting less demanding tasks in mobile phones and leaves more demanding tasks to the personal computer is another sensible solution (Stockwell, 2008). This is parallel to the statement by Burston (2011) who suggest applying mobile learning to the review and practice of what is already known and to apply bite size lessons which require minimal cognitive processing. These approaches could be seen as the answers to address this issue; it could minimise the problems in conducting learning on the go.

This section has discussed the issues associated with mobile phones and their implications for students. As highlighted, the implications include classroom issues, cyber bullying, health issues, communication skill issues, domestic issues, management issues, students' issues and pedagogical issues. These challenges need to be addressed in order to implement learning via mobile phones in schools. This section also discussed possible solutions to the problems involved in utilising mobile phones for teaching and learning. These include establishing an Acceptable Use Policy (AUP) to solve classroom issues and cyber bullying issues as well as introducing out-of-school-hours learning activities with mobile phones to solve classroom issues. Another solution is to encourage parents to monitor their children's use of mobile phones to address the issues of cyber bullying and communication skills issues. Moreover, it is essential to raise student awareness about taking occasional breaks from using mobile phones to prevent health issues and to use mobile phones productively in solving communication skill issues and domestic issues. Establishing user responsibilities and device management procedures and raising students' awareness to address the issue of damage, loss and theft should also be considered. In addressing the student issues, possible

approach would include providing support and encouragement for students to raise positive attitude towards the use mobile phones in education. Finally, in addressing the pedagogical issues, it is important to determine where mobile phones fit into the curriculum. The next sub-section discusses the challenges to the utilisation of mobile phones in mainstream education in Malaysia, as well as providing solutions to address the challenges.

### **Mobile phones in Malaysian schools: challenges and solutions**

Malaysia faces several challenges to the utilisation of mobile phones for teaching and learning – they are cultural and political in nature. The first challenge is based on the cultural norm in mainstream education in Malaysia. As in education worldwide, there are possibilities for the mobile phones to cause various issues among students in Malaysian schools.

In Malaysia, the pioneer of mobile technology deployment in schools is the E-book project, which is based in the State of Terengganu, located in the east of Peninsular Malaysia (Intel World Ahead Program Official Website). However, the implementation of this project is not without issues. During the early phase of the implementation, there were problems with misuse. Students had been found downloading indecent material and accessing malicious content (Kosmo, 2009a). To deal with these problems, bespoke software is used to monitor students' e-books (Kosmo, 2009b). Moreover, special technical personnel known as Executive Information Officers (EIO) are provided at each school to manage and maintain the devices as well as to monitor students (TESDEC, 2010).

It is a concern that the same problems might arise if mobile phones were used for educational purposes. But, with appropriate solutions, mobile phones could be used in mainstream schooling. One solution could be to deploy 'Acceptable Use Policies' as exemplified by Notre Dame High School (Telegraph, 2009) and Otumoetai Intermediate School (Bay of Plenty, 2010), as well as equipping schools with technological solutions as deployed by the E-book project in the State of Terengganu (Kosmo, 2009b). Other solutions might be to introduce out-of-school-hours learning activities, encouraging parents to monitor their children in using

mobile phones and raising students' awareness about using mobile phones productively as highlighted by Nielsen and Webb (2011) and Kolb (2008).

Another challenge is the political situation in mainstream schooling. Because of the social problems caused by mobile phones in schools, the Ministry of Education, Malaysia has distributed a circular prohibiting the use of mobile phones (Circulation Letter Number 2/2009). The reasons include theft issues, students fighting with one another, malicious messages disseminated among students and classroom distractions. These problems appear to confirm the view that mobile phones are a disruptive technology in schools (Rosile, 2007; Bauer and Ulrich, 2002; Clyde, 2004; Tatar *et al.*, 2003).

Therefore, in the effort to introduce the use of mobile phones in Malaysian secondary schools, a gradual approach should be taken to conform to the existing educational policy. Kolb (2008) stressed that, because changing the policies and perspective of school communities on the use of mobile phones will take time, schools might initially consider deploying mobile phones for learning activities outside school hours. Mobile phones can be used for field trips and homework assignments (Kolb, 2008). This approach is recommended in implementing mobile learning in Malaysia so that students do not have to bring the devices to school, thereby it could address the classroom issues and could be an appropriate approach in conforming to the existing policy. Until they are accepted, mobile phones are expected to be deployed gradually as a common learning tool.

To embrace the benefits of mobile phones for teaching and learning in Malaysian schools, it is necessary to address the challenges in terms of school culture and political nature. This section establishes the solutions which ought to be considered to enable the utilisation of mobile phones in mainstream schooling. To deal with the cultural norm in Malaysian schools, various solutions could be applied such as utilising Acceptable Use Policies (AUP), equipping schools with filtering technology, introducing out-of-school-hours learning activities, encouraging parents to monitor their children's use of mobile phones and raising student awareness about using mobile phones productively. These approaches are based on the literatures of the management and maintenance of mobile technology in education (Bonifaz and

Zucker, 2004; Smith and Cap, 2008; Vahey and Crawford, 2003; Williams, 2006; Shepparton High School Official Website; Kosmo, 2009b; Kolb, 2008; Nielsen and Webb, 2011; Bauer and Ulrich, 2002). With regard to the political nature, it is important to conform to the existing policy at schools. As a gradual approach, it would be appropriate to utilise mobile phones in learning activities outside school hours as suggested by Kolb (2008).

These solutions ought to be considered to enable the utilisation of mobile phones in Malaysian schools. To support the deployment of mobile phones, there is also a need to formulate an implementation strategy as guidance, consisting of policy and procedures. Currently, as posited by Valentine (2004), there is a lack of policy and procedure for mobile learning implementation because the field is relatively new and more research in this area is needed. This study develops an implementation strategy, which supports Malaysian schools in implementing mobile learning. The basis of the implementation strategy developed in this study is discussed in Implementation strategy for mobile learning utilisation.

## **Summary**

This section explores the challenges to the utilisation of mobile phones in education. It can be concluded that, although there are advantages in using mobile phones for teaching and learning, there are also negative implications. The issues related to mobile phones are classroom management, cyber bullying, health, communication, domestic issues, damage, loss and theft, students' issues and pedagogical issues. However, there are solutions to overcome these problems. First of all, students should have knowledge about the implications of mobile phones if they are not used sensibly and productively. Induction sessions should be conducted to raise awareness about the implications of mobile phones in terms of health, communication skills and domestic issues. The introduction of an Acceptable Use Policy (AUP) is also important in preventing classroom and cyber bullying problems. Parents also have important roles to play in educating their children to use mobile phones productively and sensibly. This could help prevent cyber bullying, communication skills issues and domestic issues from occurring. Other solutions might include establishing user responsibilities and device

management procedures, and raising students' awareness to address the issue of damage, loss and theft. In addressing issues related to students' social reality, it is important to support and encourage students to raise positive attitude towards the use mobile phones in education. Finally, in addressing the pedagogical issues, one of the solutions is to determine where mobile phones fit into the curriculum.

This section also highlights the challenges faced by Malaysian schools in utilising mobile phones in terms of school culture and political nature. To deal with the cultural norm, solutions which should be considered are utilising Acceptable Use Policies (AUP), equipping schools with filtering technology, introducing out-of-school-hours learning activities, encouraging parents to monitor their children's use of mobile phones and raising students' awareness about using mobile phones productively. With regard to political nature, it is necessary to conform to the existing policy at schools. As a gradual approach, it would be appropriate to utilise mobile phone for learning activities outside school hours, so that the use of mobile phones would not violate the existing policy.

In this study, an implementation strategy for the utilisation of mobile learning in Malaysian schools was developed. Viable approaches are also highlighted in the implementation strategy to address negative implications of using mobile phones on students. These approaches are discussed in a section in the literature review, Implementation strategy for mobile learning utilisation.

In proposing mobile learning for English vocabulary acquisition in Malaysian schools, it is also important to explore the theoretical and practical background related to mobile learning; to be more specific, the ones relating to learning theories, second language learning theories and vocabulary acquisition. In the next section, the major theories are examined and the justification is made for the theories that were chosen to underpin the study. In addition, the literature review also provides examples of the existing projects in the development of mobile application for vocabulary learning which is related to the theory underpinned in the study.



## **Mobile learning and theory**

The study of the use of mobile phones to support English vocabulary learning in Malaysian schools now turns to a consideration of the importance of exploring the theoretical background of mobile learning and learning theory. This section explores the main theories associated with mobile learning that is behaviourist, situative, collaborative and constructivist learning. The advantages and the drawbacks of these theories are discussed before providing the rationale of choosing behaviourist theory to underpin the study. In addition, the role of blended learning approach in the mobile lessons as proposed in the study is discussed. Three main theories associated with second language learning are discussed. These are innatist (Caasi, 2005), interactionist (Peregoy and Boyle, 2001) and behaviourist (Woollard, 2010). Moreover, the justification of applying the drill and practice approach within behaviourist learning in the study is discussed. Examples of mobile application which support the notion of drill and practice are also included.

This section also explores the role of vocabulary in second language learning. Vocabulary is the foundation for the basic skills of language learning: speaking, listening, reading and writing (Iheanacho, 1997). Therefore, it is important to acquire vocabulary in improving the command of the second language. Vocabulary learning is divided into two types: intentional learning and contextual learning (Nakata, 2008). Intentional learning refers to the activities that are conducted with a primary motivation to learn vocabulary. In contrast, contextual learning refers to activities that are conducted without a primary focus on learning vocabulary. Scholars in linguistics suggest that the ideal approach is to combine both methods. In the study, the use of SMS technology which applied intentional learning process is proposed to complement contextual learning activities at schools.

## Mobile learning and learning theory: the application of behaviourist theory and blended learning through mobile phones

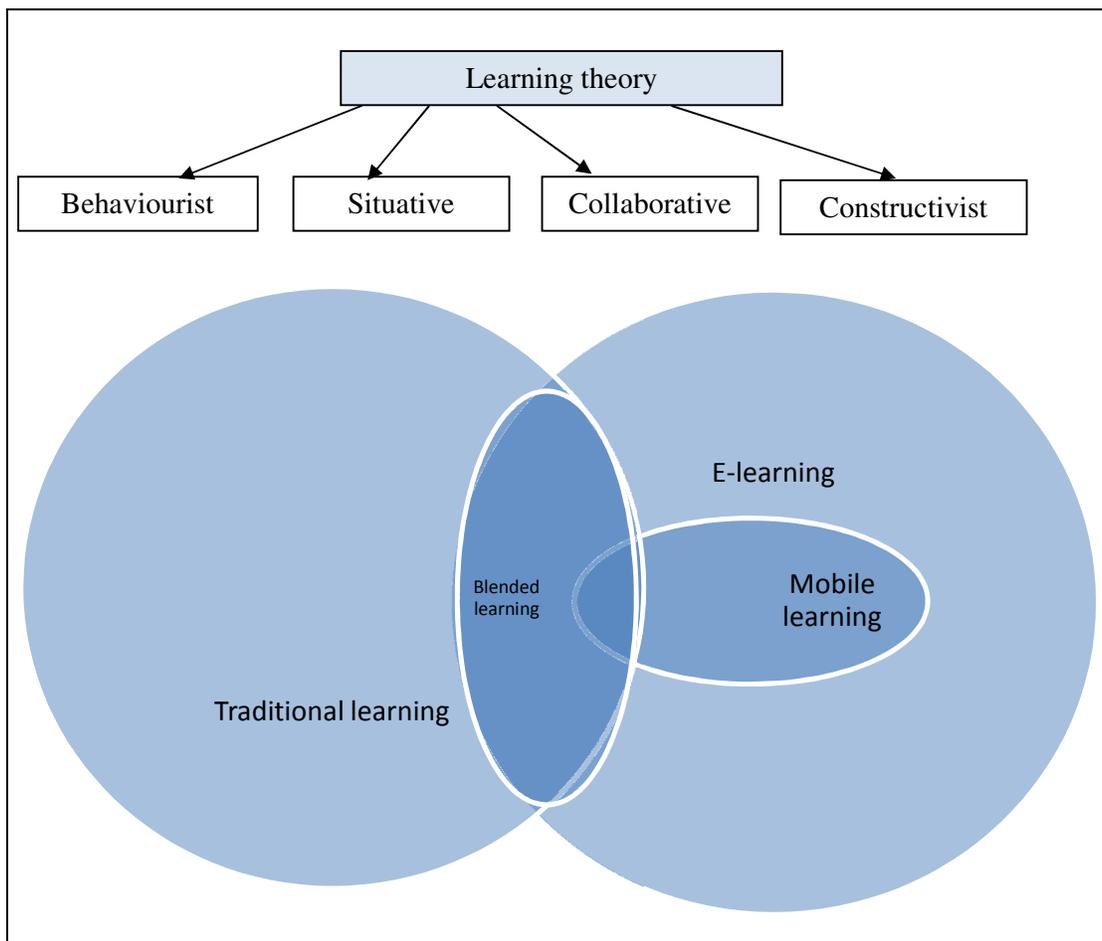


Figure 6: Learning theory and approaches to pedagogy

The rise of interest in mobile learning initiates numerous projects in mobile learning applications. These projects are underpinned by different learning theories including long established theories such as constructivism and behaviourism, and the more recently developed theories underpinning andragogy (Mishra, 2009) and heutagogy (Blaschke, 2012). This chapter concentrates on discussing the main theories associated with mobile learning that is behaviourist, situative, collaborative and constructivist as highlighted by Kadirire (2009). These main theories are depicted in the previous figure.

With regard to behaviourist learning, the theory stressed that the learner is assumed as a black box; that is without emphasising on cognitive process (Kadirire, 2009). Behaviourists do not consider the mentalist process (Woollard, 2010). Within

behaviourist learning, learning is facilitated by mobile technology through reinforcement of an association between a particular stimulus and response. Skinner stresses the notion of operant conditioning in behaviourist learning (Pritchard, 2009). An alternative explanation to this notion is that through operant conditioning, the behaviourist learning process is supported by the process; stimulus, response and reinforcement. It can be seen that the process of learning consists of providing “stimulus” through presenting teaching and learning content, obtaining “response” from learners and finally providing “reinforcement” with appropriate feedback. In mobile learning, behaviourist theory is explored in the development of language learning application through mobile phones and drill and feedback mechanism (Keskin and Metcalf, 2011).

Behaviourist learning is an effective way to learn facts (Koc, 2005). Through it, it appears that learners would have the opportunity to work on exercises in learning the facts so that teachers can concentrate on teaching more complex knowledge and understanding. However, the role of behaviourist learning can be argued. It is believed that the notion of “trial and improvement” in behaviourist learning would encourage learners to guess rather than to think properly in providing response to a question (Gray and Macblain, 2012). Moreover, Piaget, a constructivist argued that behaviourist learning might encourage learners to just repeating or memorising fact (Gray and Macblain, 2012). This could be agreed if the behaviourist approach is not supported by active learning activities to promote understanding. For example, the traditional approach in learning mathematics times tables is a behaviourist technique where learners are encouraged to learn by chanting the times tables. It would be more effective to promote students’ understanding by explaining the basis of the mathematics times tables to the learners. On the other hand, Skinner argued that through behaviourist learning, learners are not passive, they are active learners and their behaviours are initiated by reinforcement (Gray and Macblain, 2012). Providing reinforcement would be a better approach to stimulate learner to respond actively rather than just receiving information passively.

Another paradigm that underpinned the development of mobile learning application is situative learning (Kadirire, 2009). In situative learning, the use of mobile device enables learners to enhance learning in authentic context. Through a context-aware

application, learning can be enhanced by enabling learners to draw on that context (Naismith *et al.*, 2006). Examples of mobile systems that applied situated learning theory in authentic context include the Ambien Wood and MOBlearn (Naismith *et al.*, 2006). Nevertheless, it is not without drawbacks. It might not be effective for a learner who is not familiar with the context explored in the mobile lessons (Pritchard, 2009). For instance, it appears that culinary students who use context-aware application might not be able to apply situated learning effectively if they do not have preliminary knowledge related to the culinary field. However, it can be argued in the case of mobile learning application for visitors to museums or galleries. The use of mobile devices in museums and galleries has been successful (Proctor and Burton, 2003). The case study has established that the visitors found the application to be useful and informative. This could be an explanation to show that visitors, who presumably may not have prior knowledge in the related field can benefit from the information and interactive activities through mobile devices to make the most of their visit.

Collaborative learning is also explored in mobile learning (Kadirire, 2009). For collaborative learning, the use of mobile technologies promotes and facilitates interaction and collaboration between students (Benson, 2007). The application of collaborative theory in mobile learning rooted from the computer-supported collaborative work and learning (Naismith *et al.*, 2006). Collaborative learning is explored in mobile learning projects which include mobile assisted language learning, mobile response system and mobile computer supported collaborative learning (Keskin and Metcalf, 2011). From the collaborative approach advocates, it can be understood that the aim of applying this approach in learning is to foster collaboration between learners; active participation within social context. However, there might be a challenge for children who have issues in communicating, with the difficulties to participate with other people and collaborate in the learning process (Brown and Lara, 2007). On reflection, introvert learners might feel uncomfortable and apprehensive because applying collaborative learning requires them to communicate and not to remain disengaged. This could be the barrier in applying collaborative learning in mobile learning because introvert learners may not be interested to utilise the application and participate in the activities. Nevertheless,

Boticki *et al.*, (2011) reported that, collaborative learning through mobile technology has helped introverted students used the device as a medium for carrying out activities that would otherwise impossible to do. This could be an indication that mobile technologies have the potential to motivate introvert learners to participate actively in the activities underpinned by collaborative learning in mobile learning.

Constructivism and constructivist ideas can be related to mobile learning. It focuses on action where learners actively participating in activities that would support them to construct their own knowledge by challenging the learners with problems or conditions to be solved rather than receiving direct information (James Kadirire, 2009). Learners generate knowledge and understanding of the interaction between their experiences and their ideas with teachers as facilitator rather than the instructor (Gray and Macblain, 2012). Examples of mobile learning projects which applied this theory include Virus Game, Savannah and the Environmental Defectives (Naismith *et al.*, 2006). It appears that constructivist ideas could bring benefits for learners with higher ability where they could be stimulated with challenges in exploring knowledge. However, it might be challenging to apply this learning approach for students with lower ability because they will tend to avoid the difficult task (Wilson, 1997). A reasonable assumption would be that it would be hard enough for lower ability students to learn, not to mention if they were challenged by a complex approach in acquiring knowledge. Nevertheless, Liu *et al.*, (2003) reported that the use of mobile technology has helped lower ability students to constructively build their knowledge by interacting with peers and their own interactions within content-rich context. This could be a positive sign that mobile technologies have the potential to support lower ability students to apply the constructive based learning approach in acquiring knowledge.

The previous paragraphs explored the main theories applied in mobile learning; behaviourist learning, situative learning, collaborative learning and constructivist learning. Among these theories, empirical studies have shown that behaviourist learning and collaborative learning has been applied in language learning through mobile phones (Keskin and Metcalf, 2011). However, as the mobile lessons proposed in the study concentrate on teaching facts about vocabulary including the definition and the usage of the vocabulary, it pushes the mobile lessons to follow

the direction of behaviourist learning. If the mobile lessons concentrate on the area of improving skills in speech, for example, then it would be more suitable to apply collaborative learning in the mobile lessons to encourage learners communicating and collaborating with each other in the learning process. In the mobile lessons, learning vocabulary is projected to be supported by the utilisation of mobile phones through drill and feedback activities. English vocabularies are projected to be delivered through SMS with the explanation of the meaning and usage, followed by mobile quizzes. In behaviourist theory, this is referred as stimulus. The learning process continues with a response, that is the learners' response to the question in mobile quizzes as exemplified in Levy and Kennedy (2005). The mobile lessons end with reinforcement, which is the feedback from the mobile lessons for the response that was provided by the learners. The mobile lessons underpinned by behaviourist theory would provide the mechanism for the learners to work on exercise in learning factual knowledge about the vocabulary.

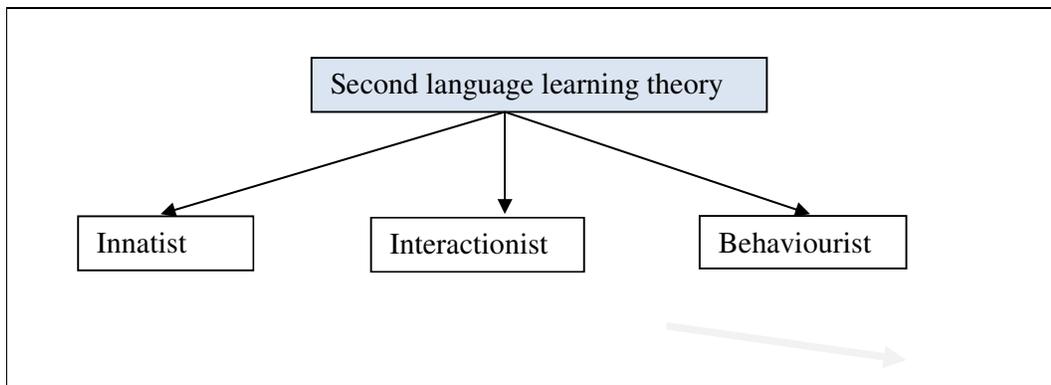
The use of SMS in vocabulary learning as an additional learning activities to school has now turned into the consideration of discussing the approaches to teaching pedagogy as highlighted in previous figure. There are four approaches to teaching pedagogy; traditional learning, e-learning, mobile learning and blended learning. Traditional learning is instructor-led classroom learning, with full opportunities for interaction between the instructor and students (Kim, 2007). With regard to e-learning, it refers to "a wide set of applications and processes, including computer-base learning, web-based learning, virtual classrooms and digital collaboration (Brown, 2003). Mobile learning is defined as any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies (O'Mallet *et al.*, 2003). Finally, the term blended learning refers to the integrated combination of traditional learning with web-based online approaches, the combination of media and tools deployed in an e-learning environment and the combination of a number of pedagogical approaches, irrespective of the learning technology used in each case (Dzakiria *et al.*, 2006). In this context, the third definition by Dzakiria *et al.* (2006) which relates to any type of learning technology is referred in the study; the form of blended learning where mobile phones are proposed to be used after school hours to support vocabulary acquisition activities

at schools. Blended learning was aimed to complement multiple teaching and learning approach; as an additional teaching and learning activity.

In the study, the use of mobile phones for vocabulary learning is with the intention to complement learning activities at school. Blended learning through mobile phones connects school and home; as an additional activity outside school hours parallel to the study by Saran and Seferoglu (2010). As proposed in this study, students explore vocabularies through mobile lessons, and later apply that vocabulary in writing, reading, speaking and listening activities at school. Otherwise, mobile lessons can also be used as a revision aid or homework to review the vocabularies that students have acquired at school through writing, reading, speaking and listening. Attewell *et al.* (2009) stress the significance of applying mobile learning in supporting homework. As a kind of homework, the application of mobile lessons could provide an opportunity for students to enhance their achievement in English Language or specifically their vocabulary knowledge and to improve the degree of engagement to school-related tasks. This would scaffold learning activities related to vocabulary acquisition at school. The combination of learning activities at schools and learning activities through mobile phones would ensure the effectiveness of the mobile lessons proposed in the study. Students would have the opportunity to apply and explore the vocabulary that they have learned through mobile phones in a more meaningful context at schools. Otherwise, students would have the opportunity to review the vocabulary that they have acquired at schools through the mobile lessons.

### **Second language learning theory: the application of behaviourist theory in vocabulary acquisition**

As this study explores the use of mobile phones to support vocabulary acquisition in English Language learning in Malaysian schools, therefore it is essential to understand the theoretical background of second language learning theory and vocabulary acquisition. According to Larsen-Freeman and Long (1991) there are at least forty learning theories associated with second language learning. However, this section will explore three main theories: innatist, interactionist and behaviourist as stressed by Gersten and Hudelson (2005) which is depicted in the next figure.



**Figure 7: Second language learning theory**

Within innatist perspective, Chomsky stated that human beings have an innate capability for language and suggested that language learner was the constructor of language (Caasi, 2005). The cognitivist notion “it is all in your mind” is synonym to this theory (Lightbrown and Spada, 2006). As proposed by Chomsky, in every human brain, there is a special ability to discover the underlying rules of language (Caasi, 2005). In second language learning, it is claimed that the learner learns language similar to the way they learned first language; learner acquires a second language by synthesising and constructing the grammar of language using the innate ability that they have in their mind (Peregoy and Boyle, 2001). From the statement by innatist advocates, it could be assumed that learning a second language will occur naturally. Over time, there are possibilities that the mistakes would be corrected by the learners as they encounter and comprehend the correct usage of the second language. This can be supported by teachers, friends or other medium such as books as stressed by Peregoy and Boyle (2001). However, proponents of this theory argue that there is a critical period of innate ability for language acquisition; innate ability is available for every human in acquiring first language, but not for later age when one acquires a second language (Mitchell & Myles, 1998). In addition, unlike native speakers, second language learners are more likely to be unstable to follow their instinct or innate capability in synthesising the grammar of the second language (Mitchell & Myles, 1998). This could lead to an argument whether innatist approach could support second language learners, mostly who has passed their critical period and who may not have the capability to use their instincts as native speakers. However, in a study among Japanese adults who learn English Language has shown that there is no such thing as a critical period; learners are able to construct the language that they learn intuitively

(Mitchell & Myles, 1998). Some scholars believe that innate ability would still be available at a later age and therefore the application of approach influenced by innatist theory is also suitable for learners to acquire second language (McLaughlin, 1987). Nevertheless, despite of the proposition of its suitability for second language acquisition, it appears that learning through innatist approach is an unstructured process and therefore it would be time consuming and would be a slow process to acquire second language.

With regard to interaction theory, one acquires a second language by interacting with other people; it can be teachers, friends or other medium that supports interaction and communication (Peregoy and Boyle, 2001). Interactions are the key element in supporting learners by providing a model to be contextualised in learning second language. This theory value the notion of modification (Lightbrown and Spada, 2006), as learners involve in trial and error process of communication in order to help them understand and be understood while communicating in a second language. Interactionist approach encourages second language learners to communicate with native speakers (Peregoy and Boyle, 2001). Thus, interactionist theory of second language acquisition could be a sensible approach to enable learning occurs within a context; knowledge of second language learning to be applied in real situations with real people especially with native speakers. It can be seen that this paradigm creates an impulse for learners to communicate and provide treatment of errors. While errors will be corrected naturally as meaning is negotiated; however some errors may need for explicit corrective instruction, for example with guidance from teachers (Peregoy and Boyle, 2001). Interactionist approach is effective to acquire the second language; however, second language acquisition researchers believe that acquiring a second language need combination of both interaction and innate learning capabilities (Mitchell & Myles, 1998). Therefore, a better approach would be to complement the interactionist approach with the innatist approach in acquiring the second language; learners acquire a second language from the interaction with the surrounding supported by the innate ability to synthesise and construct the grammar of the language.

Another aspect of second language learning which is discussed in this section is associated with behaviourist theory. Behaviourist theory is considered as the oldest

among all theory of second language learning and pioneered by Skinner (Woollard, 2010). According to Skinner (1974), in behaviourist learning, the process of second language learning consist of presenting learning content (stimulus), obtaining a response from learners (response), and finally providing appropriate feedback (reinforcement). The notion “Say what I say” is synonym to this theory (Lightbrown and Spada, 2006). This approach is particularly useful in second language learning because it is a structured learning process, where learners are supported by a sequence of drill and practice activities with immediate treatment; the correct answers are awarded with positive reinforcement and errors are corrected immediately. As behaviourist theory offers a structured and deliberate learning process, perhaps it offers an intensive way to acquire a second language, for example to be applied in the preparatory class to study abroad. However, it is also has its drawback. It offers an insufficient explanation in the complexity of language learning (Research Centre for Languages and Cultures Website). In addition, it is didactic and ignores the notion of heutagogy, where learners do not have control of the learning (Woollard, 2010). It can be argued that learning activities which are underpinned by behaviourist theory are often set up to achieve certain outcomes and consisting of structured processes which need to be completed by the learners. This approach does not take account of learners’ stance in learning; learners are constraint under rigid process and have less control to explore knowledge by their own way.

However, it is apparent that in mobile learning, behaviourist theory is explored in the development of language learning application through mobile phones and drill and feedback mechanism (Keskin and Metcalf, 2011). In wider settings, the significance of mobile applications to support vocabulary learning within behaviourist learning has initiated the increasing efforts in developing mobile applications for vocabulary acquisition. These applications established the utilisation of mobile phones to support vocabulary acquisition through drill and practice. The following list is not comprehensive, but representatives of various initiatives in mobile learning development for vocabulary learning through drill and practice approach. These applications are shown in the following table.

Reference	Purpose	Target people	Medium	Findings
Saran and Seferoglu (2010)	Supporting foreign language vocabulary learning	64 students attending the English Preparatory School	MMS and SMS	The mobile lessons are engaging and effective in improving learners' vocabulary learning.
Cavus and Ibrahim (2009)	Supporting learning new English words	45 first year undergraduate students	SMS	The students' vocabulary was improved and the students also provided positive feedback about the mobile lessons
Butgereit and Botha (2009)	Supporting English vocabulary and spelling learning	7 pupils from grades four in primary school	Mobile web interface and mobile application	The application provides an engaging study environment for learning vocabulary and spelling
Cooney and Keogh (2007)	Supporting learning Irish vocabulary	69 second year Irish students and 3 Irish teachers	SMS	The application was proved useful and popular with teachers and students alike.
Stockwell (2007)	Supporting English vocabulary learning	11 participants from English class at Waseda University, Japan	Intelligent tutoring system (ITS) and SMS/MMS	The application was proved to support learners with sophisticated vocabulary learning activities
Thornton and Houser (2005)	Supporting English vocabulary learning	333 Japanese university students	SMS	The application offered a push method to motivate students to learn vocabulary regularly and to help them memorise effectively
Levy and Kennedy (2005)	Supporting Italian vocabulary learning	18 third year students in "Italian Literature and Society"	SMS	The application offered a motivating and engaging medium for vocabulary learning and supported students to learn Italian language

**Table 3: Mobile learning projects underpinned by behaviourist learning**

In the context of the study, behaviourist approach is chosen according to several factors. Firstly, Malaysian students are not native speakers; therefore they may not have the capability to use their instincts effectively to acquire vocabulary as native speakers as advocated in innatist perspective. They may need more guidance and deliberate approach in acquiring vocabulary. Secondly, innatist approach is an unstructured process in acquiring second language, and therefore might not be relevant to help students in Malaysia to acquire vocabulary intensively. With regard to interactionist approach, it would be an effective way to acquire second language. It encourages learners to communicate in acquiring second language and enables learning occurs within a context. However, as discussed previously, the mobile lessons concentrate on learning factual knowledge about vocabulary and so it pushes the mobile lessons to be under the umbrella of behaviourist learning. In addition, behaviourist theory would offer a structured and intensive learning approach for students in Malaysian schools to acquire vocabulary. Vocabulary acquisition is suggested to be supported by mobile phones through drill and

practice in the mobile lessons. Complemented with learning activities at school, it would become a form of blended learning. This would help the students to improve their command in English Language, specifically vocabulary knowledge, by providing an additional mechanism to support vocabulary acquisition outside school hours.

### **Second language learning theory: the role of vocabulary in second language learning**

As this study proposed the use of mobile phones to acquire vocabulary, the section proceeds with the discussion of vocabulary learning approach and its role in second language learning as depicted in the next figure. It includes the discussion regarding the role of vocabulary acquisition in second language learning, the approaches applied in vocabulary acquisition and ended with the discussion of the critics regarding the approaches.

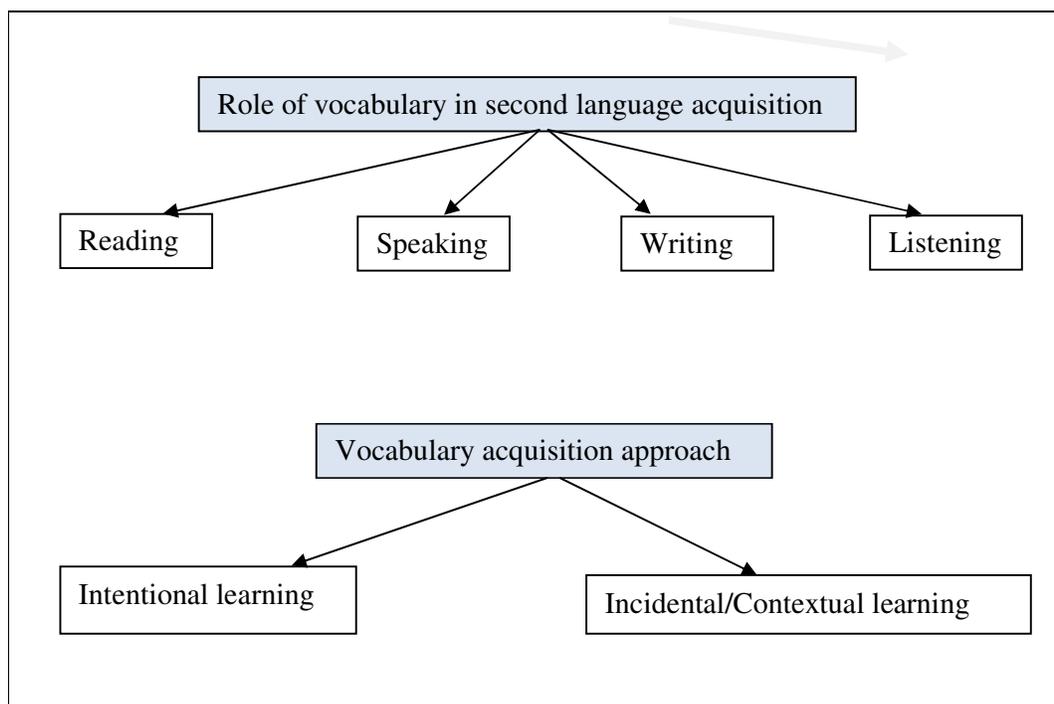


Figure 8: The role of vocabulary in second language acquisition and the approach to acquire vocabulary

Vocabulary is the most important part of language and is essential in language learning. Vocabulary is the basis of linguistic abilities and is necessary for the development of language skills: reading, speaking, writing and listening (Iheanacho,

1997). Without sufficient knowledge of vocabulary, language learners would face the difficulties in reading, speaking, writing and listening. Chen and Chung (2008) highlighted the importance of vocabulary compared to grammar. Even with poor grammar, one might still be able to communicate in a language, but with a limited vocabulary it would be difficult to communicate in a language. In addition, Iheanacho (1997) stressed that vocabulary learning is fundamental for second-language proficiency. If one does not have sufficient knowledge of vocabulary, one's proficiency in a language would be poor.

From the researcher's point of view as a second language learner, one who has insufficient knowledge of vocabulary would have anxiety about their ability in the important aspects of second language learning; reading, speaking, writing and listening. In reading, it appears that one of the challenges is encountering complex new words. The reading process would be interrupted when having to look up at the dictionary to understand certain vocabularies. The reading process would be more challenging when one has to understand the meaning of idioms, metaphorical and creative language which the lexical units stand as a whole, not as individual (Rojas, 2008). However, one could argue that it is important not to confuse about the correlation of having an adequate reading vocabulary by having skill in reading. Vocabulary is clearly an important factor in reading, as readability studies show, but it is only one of a range of factors which could contribute towards the enhancing the process of reading (Nation, 1990). Despite of this, as discussed above, it is apparent that it is still necessary to enhance vocabulary knowledge to improve the reading process.

In speaking, learners may not be able to say what they want to say if they do not have enough vocabulary (Nation, 1990). According to the study by Rojas (2008), the results showed that 50% of the learners in second language learning considered speaking as their main concern and 41.6 % said that vocabulary was the component that was hindering their oral competence. This is evidence of the significance of vocabulary in oral ability. As highlighted by Nation (2001), when an individual wants to speak in the foreign language, he or she will need to retrieve and produce the appropriate spoken word form. From the researcher's experience, one would feel intimidated for lacking vocabulary to communicate, especially in

academic speech, for example when delivering a presentation or participating in a discussion. One might require a complex word or an academic word to help him or her expressing their thoughts or ideas. Therefore, it is clear that it is important to acquire enough vocabulary in improving oral ability.

Without enough vocabulary, learners would also have difficulties in writing. It appears that writing requires learners to connect words to come together to form a coherent whole to express their ideas. As stated in (Rojas, 2008), writing is a skill where vocabulary is used for productive use and it is a demanding task because it implies retrieval and production of words. In addition, Nation (2001) states that word frequency studies indicate that a much bigger vocabulary is needed for writing than speaking because one tends to explore about formal or weight matters during writing compared to speaking. These appear to be some of the evidence of the importance of vocabulary in writing skills.

Finally, vocabulary also have important roles in listening. As stated by Rojas (2008), without sufficient vocabulary, listening is a challenging activity because when listening to someone who is speaking, there are no pauses, so there is a need to hear the words, retrieve their meaning and in most cases, have to answer immediately to what was heard and this might bring pressures to learners. Reflecting on the researcher's own experience, having insufficient knowledge about some vocabularies brought impact on the researcher's ability to listen attentively. Also, as stressed by Nation (2001), second language learners would need at least 95% coverage of the running words in the input in order to gain reasonable comprehension from what they heard and to have reasonable success at guessing from context. Hence, it is necessary for learners to master vocabulary in improving listening skills.

The previous paragraphs stress the importance of vocabulary in order to converse efficiently in reading, speaking, writing and listening. It is essential to acquire vocabulary in improving the command of the second language. Therefore, the following paragraph explores the key knowledge of vocabulary acquisition approach. According to Nakata (2008), vocabulary acquisition is divided into two types: intentional learning and incidental learning. Intentional learning refers to the

activities that are conducted with a primary focus on learning vocabulary such as rote learning with word lists, word cards or flash cards as well as a drill and practice approach with a computer. Conversely, incidental learning refers to activities that are conducted without a primary focus on learning vocabulary such as through reading, listening and watching television. This approach is also known as contextual learning. Hu and Deng (2007) stressed the importance of contextual learning to enable learner to learn additional linguistic, semantic, syntactic, and collocation features of a word.

However, contextual learning is not without drawbacks. Contextual learning might be challenging for second-language learners. First of all, as explained by Huang and Liou (2007), second-language learners need to understand at least 95 per cent of the words in a text or need to have at least a 5,000-word lexicon of general English vocabulary to effectively apply contextual learning. For academic purposes, a lexicon of at least 7,000 words is needed (Groot, 2000). Huang and Liou (2007) reported that most high school students in countries where English is a second language know less than 5000 words of English. Therefore, it appears that it would be difficult for second-language learners to apply the contextual learning method because some of them might have limited vocabulary, especially the beginners.

Problems relating to contextual learning have also been stressed by Hu and Deng (2007). Students will face difficulties in applying contextual learning if they have limited vocabulary knowledge and low vocabulary capacity. Unlike native speakers, second-language learners might have problems guessing the meaning of words from context when applying contextual learning. Hu and Deng (2007) and Huang and Liou (2007) agreed that, unlike native speakers, second-language learners have inadequate word knowledge to infer word meanings from context. Furthermore, contextual learning is a slow process, haphazard and time-consuming (Nakata, 2008; Zapata and Sagarra, 2007). Nakata (2008) noted Laufer's (2003) estimation that second-language learners need to read a text consisting of 200,000 words to learn 108 words from context. From the researcher's point of view, reading 200,000 words to acquire 108 new ones would be laborious and require a huge amount of time.

On the other hand, the impact of intentional learning of vocabulary acquisition might also be disputed. Nakata (2008) stressed that intentional learning is an old-fashioned behaviourist learning model. It cannot support learners in understanding other important aspects of language such as the semantic, syntactic, and collocation features of a word. Nevertheless, the intentional learning method would have an impact on vocabulary learning with the integration of technology in complementing contextual learning. This concurs with the opinion of Tozcu and Coady (2004) that it would be more effective to combine intentional learning with contextual learning in supporting vocabulary acquisition. Contextual learning should be complemented with intentional learning activities such as word lists, word cards or drill and practice with technology (Nakata, 2008). This is where the use of mobile phones could support vocabulary acquisition by providing a mechanism of drill and practice, which is a form of intentional learning approach in vocabulary acquisition to complement contextual learning approach. Through the use of SMS technology, the intentional learning process would be useful for students in enhancing their knowledge of English vocabulary. This would support contextual learning activities related to English vocabulary acquisition at school such as through writing, speaking, reading and listening.

## **Summary**

This section explores the main theories associated with mobile learning that is behaviourist, situative, collaborative and constructivist learning. It discusses the advantages and the drawbacks of these theories before providing the rationale of choosing behaviourist theory to underpin the study. In addition, it provides the discussion of the role of blended learning approach in the mobile lessons as proposed in the study.

In proposing mobile learning for English vocabulary acquisition, this section also explores the theoretical background of second language learning and vocabulary acquisition. Three main theories associate with second language learning known as innatist, interactionist and behaviourist learning are discussed. In addition, the rationale for applying the drill and practice approach in the study was also

discussed before providing some examples of mobile application supported by the notion of drill and practice.

Having explored the theoretical background of second language learning, the section continues to explore the role of vocabulary in second language learning. It discusses the importance of vocabulary in second language learning. It provides an overview of intentional learning and incidental learning. Linguistic scholars suggest combining both methods to support vocabulary learning. This is where the use of mobile phones could help by providing a mechanism underpinned by intentional learning in acquiring vocabulary to complement incidental learning.

This section explored the key knowledge pertaining to the theoretical and practical background related to mobile learning; to be more specific, the ones relating to learning theories, second language learning theories and vocabulary acquisition. The next section continues with a discussion of the implementation strategy to support mobile learning implementation in Malaysian schools. The basis of the development of the implementation strategy is discussed. It establishes the key strategies associated with mobile learning implementation: the design of the mobile lessons; strategy for providing facilities; and policy and procedure.

## **Implementation strategy for mobile learning utilisation**

To support the utilisation of mobile learning in English Language learning in Malaysian schools, it is necessary to develop an implementation strategy as guidance. According to Valentine (2004), there is a lack of guidance for mobile learning utilisation in mainstream education because the field is relatively new and more research in this area is needed. Furthermore, no guidance has yet been developed for mobile learning utilisation in Malaysian schools. Therefore, this study aims to provide the required information.

This section discusses the basis of the implementation strategy formulated for Malaysian schools which was documented in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The document consists of the key strategies in implementing mobile learning: mobile lessons, facilities, ownership model, Acceptable Use Policy (AUP), management and maintenance, specific roles to support the implementation, and support for major stakeholders.

With regard to the mobile lessons, it is essential to ensure that the mobile lessons established in the study are pedagogically sound for vocabulary learning and can be integrated in the English Language subject in Malaysian schools. It is also necessary to propose a strategy for acquiring the facilities, and to formulate ownership models to ensure that students can acquire mobile devices. Students might be affected by the negative implications of using mobile devices if there is no guidance. This is where an Acceptable Use Policy (AUP) could help in eliminating negative implications. Although the policy is in place, strategy in regard to the management and maintenance is also important. Besides, it is also essential to assume and assign specific roles such as technical support staff, ICT coordinators and English subject leaders to support the implementation. Finally, strategies to support major stakeholders such as teachers, students and parents is also the key to ensuring the success of implementing mobile learning.

This section begins with a discussion of the initial proposal for mobile lessons and the required infrastructure, and closes with an overview of the proposed policy and

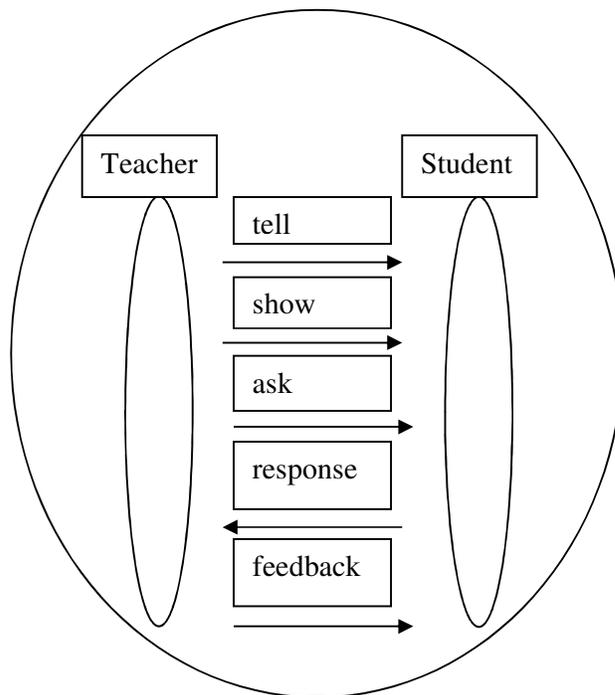
procedures. As stressed in the above paragraph, this section only discusses the basis of the initial development of the implementation strategy which was highlighted in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The implementation strategy evolved over the period of this study as a result of consultations with the respondents. Two sections which are called “Evaluation of the implementation strategy: preliminary field tests” and “Evaluation of the implementation strategy: main field tests” discuss the findings from the field tests which determine the final version of the implementation strategy.

### **Curriculum integration**

This part provides an overview of the proposed mobile lessons and the infrastructure to support English Language learning through mobile learning in Malaysian schools. This section is divided into two subsections. The first subsection discusses the initial structure of the mobile lessons. The second subsection continues with a discussion of the initial suggestion to provide facilities for the implementation.

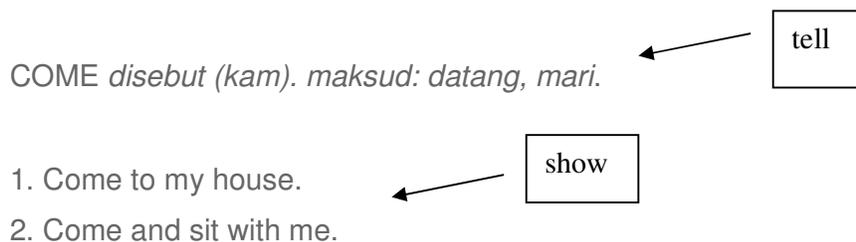
### **Mobile lessons**

In this study, mobile lessons are proposed to be used to support vocabulary learning. The structure of the mobile lessons is based on the e-learning transaction by Gilbert and Gale (2007). It applies five key teaching acts; “tell”, “show”, “ask student to use and apply”, “student response” and “give feedback”. The e-learning transaction proposed by Gilbert and Gale (2007) is illustrated in the next figure. Although the e-learning transaction is proposed for use in e-learning, it is apparent that it is appropriate for mobile learning as mobile learning lies at the intersection of mobile computing and e-learning as highlighted by Quinn (2000). This is similar to the view of Georgiev *et al.* (2004) who state that mobile learning is a subset of e-learning.



**Figure 9: Structure of an e-learning transaction (Gilbert and Gale, 2007)**

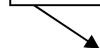
The design of the mobile lessons established in the study was also based on previous projects in vocabulary-learning through mobile devices. The first project which becomes the basis of the mobile lessons is an English vocabulary lesson through SMS which is known as SMS-ME-ENGLISH from a company called LTT Global Communication (<http://elearning.bluehyppo.com/smsenglish/>). In SMS-ME-ENGLISH, the mobile lessons consist of explanations of how to pronounce English words, as well as some examples of the words' usage. This is shown as follows:



It can be seen that the mobile lessons apply two key teaching acts, which are “tell” and “show”, but do not apply other fundamental key teaching acts, which are “ask student to use and apply”, “student’s response” and “give feedback”, as suggested by Gilbert and Gale (2007). Thus, other applications are explored to ensure that the mobile lessons established in the study are in accordance with the model of the e-learning transaction by Gilbert and Gale (2007).

Another application to have been explored is Vidioms by Thornton and Houser (2005). This is shown as follows:

tell



Each page presents one idiom (e.g., 'He has a big mouth. '), first explaining the idiom's meaning in the student's first language (L1; Japanese, in our case),



show

and then showing a computer animation illustrating the literal meaning (e.g., a character with an unusually large mouth), and presenting a second-language (L2; English) script and live-action video showing the idiomatic meaning (i.e., a person who talks too much, giving away secrets).

ask student to use and apply

student response

give feedback



A final quiz checks students' understanding.

It appears that this mobile lesson applies three key teaching acts; "ask student to use and apply", "student response" and "give feedback" as additions to the main key teaching acts, which are "tell" and "show". This application has become the basis of the mobile lessons proposed in the study.

The mobile lessons are also based on the 'Learning Italian' project which uses SMS as a mechanism to deliver vocabulary (Levy and Kennedy, 2005). Regarding the content, it can be seen that the mobile lessons consist of new words (key teaching act: tell), definitions (key teaching act: tell) and examples of context sentences (key teaching act: show), which are scheduled at appropriately spaced intervals via SMS.

Based on the previous applications, the study proposes establishing mobile lessons, which consist of vocabulary explanation, quizzes and feedback. There are

three sections in the mobile lessons: (i) Introducing vocabulary with pronunciation (key teaching act: tell); (ii) Showing the use of the vocabulary (key teaching act: show); and (iii) Reviewing the vocabulary with multiple-choice questions (key teaching acts: ask student to use and apply, student response and give feedback). The mobile lessons are projected to conform to the syllabus provided by the Ministry of Education, Malaysia, to support teaching and learning. The mobile lessons are also projected to support contextual learning activities in schools, such as speaking, listening, reading and writing; as a form of blended learning. A list of vocabulary appropriate for secondary school students aged 13 to 17, from Form 1 to Form 5, is proposed based on the Syllabus and Curriculum Specification of the Curriculum Development Centre, Ministry of Education, Malaysia (Syllabus and Curriculum Specification of the Curriculum Development Centre). To enhance the mobile lessons, perhaps, an alternative approach is to apply multimedia elements, such as sound and animation as exemplified in Mobile Malay Idioms for Malaysian primary schools (Salam *et al.*, 2008). The initial structure of the mobile lessons is shown in the next figure.

<p>a) Introducing vocabulary (pronunciation in Malay Language)</p> <p><b>ABSOLUTELY</b>  Pronounce as (absolutli)  Meaning: benar-benar, betul-betul</p> <p>b) Explaining the usage of the vocabulary  Examples:  1. She is absolutely beautiful.  2. Your writing is absolutely fine.</p> <p>c) Reviewing the vocabulary through multiple choice question  Which one of the following is the right usage for the word <b>absolutely</b>?</p> <p>A. Wow! The clothes are only RM2. The price is absolutely fantastic.  B. I am not sure whether I will join you tomorrow or not. In other words, I am absolutely certain.  C. The result will not be released before the end of the month. Absolutely we will get the result in the middle of the month.  D. You have to take your medicine now. You look absolutely fine.  (Correct answer: A)</p> <p>d) Feedback mechanism  Students send SMS containing answers for quizzes directly to teachers' number (computer server). An automatic feedback from a teachers' number (computer server) will be delivered to students providing the answer and explanation.</p> <p>For example: Students will type: <b>Q1: A to number 8888.</b></p> <p>Students will receive: <b>Your answer is correct. A is the correct answer because.....</b></p>
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**Figure 10: Initial structure of the proposed mobile lessons**

In determining the best time to deliver the mobile lessons through SMS, examples from previous mobile learning projects are explored. According to Uday Bhaskar and Govindarajulu (2008), late nights and forenoon are not suitable times to deliver mobile lessons. On the other hand, Levy and Kennedy (2005) reported different findings, with students expressing an interest in receiving messages at 9 am or between 10 am and 6 pm. Ibrahim and Cavus (2008) revealed similar findings to Levy and Kennedy (2005). Their study suggests that students preferred to receive messages from 9 am to 5 pm. However, these studies are based on surveys of university students. Therefore, to implement mobile learning in Malaysian schools, scheduling ought to be customised according to secondary schools' timetables. In Malaysia, students attend either morning sessions from around 7.30 am to 1.40 pm or afternoon sessions from around 1.05 pm to 6.45 pm (Nan Hwa Secondary School Official Website). A better approach would be to deliver the mobile lessons out-of-school hours, suitable for both sessions.

Another important issue that need to be addressed is to determine the number of words to be delivered in the mobile lessons. One question that might need to be asked is whether students would be able to cope with the lessons if too many words are delivered. Levy and Kennedy (2005, p. 80) reported that "As far as the number of messages per day was concerned, two a day ( $10/18 = 55.6$  per cent) or three a day ( $6/18 = 33.3$  per cent) were the clear majority preferences."

In addressing the issue, the study established that the mobile lessons are projected to be delivered three times a week, at 8 pm on Mondays, Wednesdays and Fridays. In each mobile lesson, it is proposed to introduce three new words to students. Thus, students will learn nine words every week. Monthly quizzes are also proposed to support the students in revising the words which have been learned. The study also established the element of personalisation for inclusion in the mobile lessons. This concurs with the view of Shuler (2009), who highlighted the affordances of mobile phones to support personalisation.

In order to help teachers monitor students' progress, the study proposes a mechanism called the Student Progress Tracking System. This system is based on a design by Mahamad et al. (2008) and is depicted in the next figure. With this

mechanism, teachers would be able to track students' progress to provide guidance.

Student progress tracking system			LOG OUT
Mobile Vocabulary	STUDENT MOBILE NUMBER	STUDENT NAME	PROGRESS TRACKING
 <p>Username: <input type="text"/></p> <p>mm506</p> <p>Password: <input type="text"/></p> <p>mm506</p>			<i>View Performance</i>
			<i>View Performance</i>

Figure 11: Student progress tracking system

This subsection discusses the structure of the mobile lessons, the schedule for delivering them, and the supporting mechanism. Furthermore, the strategy for providing facilities to support the implementation is also important. The following subsection proceeds with the discussion.

## Resourcing mobile learning

One of the most challenging aspects of the introduction of technology is cost (Quinn, 2011). As such, to integrate mobile technology into Malaysian schools, funding is a major concern. The next figure illustrates the initial proposal for the infrastructure suggested in the study which was adapted and customised based on the design by Siraj and Nair (2007).

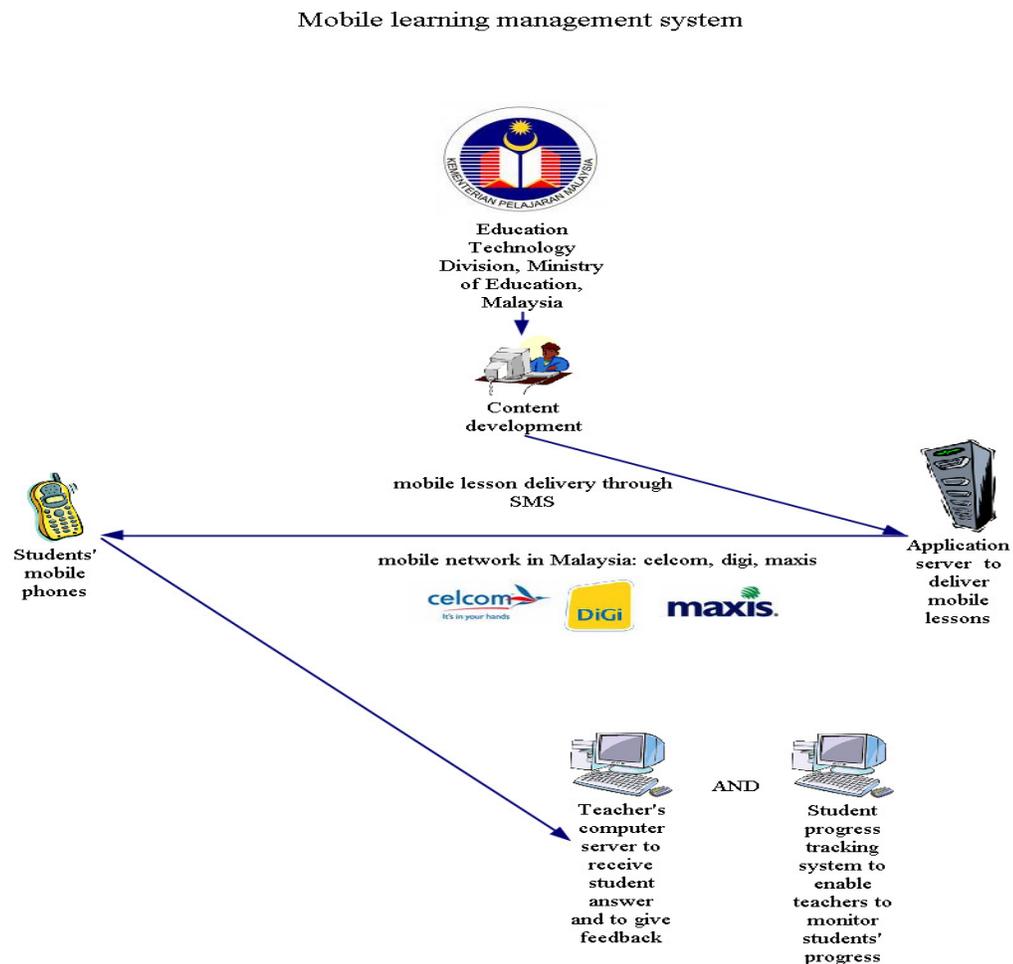


Figure 12: Mobile learning management system

As shown above, to implement mobile learning in Malaysian schools, it is necessary to consider the cost of mobile content development, an application server to deliver mobile lessons, mobile devices, mobile network, teachers' computer server and students' progress-tracking systems. The existing technology

integrations in Malaysian schools have shown that the government has invested in providing the facilities (Educational Technology Division Malaysia's Official Portal; Ministry of Education Malaysia, 2008). Therefore, from an optimistic point of view, there is a possibility that the government will support the entire cost of implementation. However, it is also worth considering alternatives to support the funding. An alternative would be to secure funding from private companies. As pointed out by Williams (2006), the alternative is to use products and services from the sponsoring companies. The collaboration between government and sponsoring companies could be considered as a win-win situation for both parties. The government would be able to reduce the cost of the implementation while sponsoring companies would be able to promote their products and services. Siraj and Abdullah (2005), scholars from Malaysia, encouraged collaboration between the Ministry of Education, Malaysia, and ICT companies as well as other private agencies in providing ICT resources in schools. An approach could be to share the cost of providing a mobile network with network providers in Malaysia and the cost of providing mobile devices with mobile phone manufacturers in Malaysia. These companies could also offer easy-payment schemes. This suggestion concurs with the view of Abdullah and Siraj (2010b), to encourage private companies to offer special discounted packages on network connectivity and mobile devices to ensure the wider implementation of mobile learning in Malaysia. Hsueh (2011) also encouraged negotiations with manufacturers for special educational prices.

It also appears that some companies in Malaysia have contributed to the technology integration projects with the Ministry of Education, Malaysia. Intel Malaysia has collaborated in introducing a one-to-one laptop project in Malaysian schools (Sultan *et al.*, 2011). Other projects associated with private companies include the On-Line Collaboration project with Oracle, Parents SMS Project with MyPresto and Professional On-Line monitoring with MDEC (Educational Technology Division, Terengganu State Official Website). These initiatives could be an indication that some Malaysian companies are playing important roles in technology integration in schools. Therefore, encouraging companies in Malaysia to collaborate with the government in sponsoring the implementation could be a sensible solution.

In addition to collaborating with sponsoring companies, another viable approach could be through community support, as suggested by Pownell and Bailey (2003). Livingston reported that, in a laptop project at The Peck School, the implementation was supported by the fundraisers (Livingston, 2006). However, the impact which would be brought by the community support may be insignificant compared to the impact which would be achieved by collaborating with private companies. As shown in The Peck School initiative, fundraising organised by the community was time-consuming. The school also uses a tuition fees approach; tuition fees were increased to cover the cost of the implementation (Livingston, 2006). However, for schools in Malaysia, this approach may not be suitable because the Malaysian government has ensured free education in mainstream schooling as reported in Utusan Malaysia (2007).

Regarding the cost of content development, one Malaysian company known as LTT Global Communication has developed mobile lessons (LTT Global Communications Official Website). A viable approach could be to consider collaborating with content developers by offering incentives for their contribution. In addition, it would also be beneficial to collaborate with local universities. Some universities in Malaysia have conducted mobile learning projects (Salam *et al.*, 2008; Mahamad *et al.*, 2008; Shiratuddin and Zaibon, 2009). These projects could be seen as the sign that local universities have the expertise to develop mobile learning content. In order to reduce the costs of developing mobile lessons, open-source software might also be considered which is parallel to the suggestion by Mahamad *et al.* (2008).

In order to acquire mobile devices, a feasible option would be to introduce a scheme that enables parents to purchase these devices. An approach would be to utilise affordable mobile phones, probably costing under RM200 which is equivalent to USD61. Smart phones, which offer better functions, might also be considered when they become less expensive in Malaysia.

This subsection discusses the strategy for providing facilities for the implementation of mobile learning. Regardless of the strategy for preparing the facilities, it is also important to develop policy and procedures to guide students in using the mobile

devices. The next section continues by discussing the initial development of policy and procedures.

### **Policy and procedures**

This section provides an overview of the initial development of policy and procedures. It begins with a discussion of the ownership model which is suggested to enable students to acquire mobile devices. In addition, students will be guided by an Acceptable Use Policy (AUP). It will also function as an approach to address the issue of negative implications for students. The implementation strategy is also supported by possible approaches to managing and maintaining the equipment. Suggestions with regard to the specific roles which will be needed for the implementation are also described. Finally, this section includes suggestions regarding the support that will be provided to the major stakeholders.

### **Ownership model**

On reflection, a digital divide may occur as the result of the difficulty in acquiring mobile devices. Therefore, to provide opportunities for students to acquire mobile devices, a study has been conducted to find appropriate ownership models. One of the viable ownership models is proposed by Vahey and Crawford (2002). There are two strategies; Shared Set Strategies and Personal Use Strategies. These are depicted in the following table:

<b>Ownership model</b>	<b>Details</b>
Shared Set Strategies	<p>Shared set: A classroom set was shared by all students and the handheld was used only for specific periods or activities.</p> <p>Assigned classroom handheld: Each student was assigned a handheld; which was used only for specific periods or activities only.</p>
Personal Use Strategies	<p>Personal use at school: Each student was assigned her or his own handheld to use throughout the day. However, the handheld was not allowed to be taken home.</p> <p>Full personal use: Each student was assigned her or his own handheld; and were allowed to be taken home.</p>

**Table 4: Ownership model based on Vahey and Crawford (2002)**

On the other hand, Williams (2006) proposed other ownership models, which are depicted in the following table:

<b>Ownership model</b>	<b>Details</b>
Classroom Loan and Use	Handheld is used in one classroom, for a particular subject, lesson, or unit. Handheld is stored when not in use before activities beginning.
School wide Loan and Use	Handheld is used by one class or one grade level, and students are assigned a handheld for which they are responsible during classroom hours. Handhelds return to a predetermined location for charging when the day is over.
School and Home Use	Handheld is assigned to each student in a particular class or grade level (or the entire schools), and become the "loaned" property of the student for home and school use for a predefined period of time, such as a semester or school year. The student assumes responsibility for the care and handling of the device both in and out of school.
Ownership	This is the preferred option. In this scenario, students "own" the handheld because the school has received a grant and assigned the grant units to students in perpetuity, the school has made handheld computers available for purchase at a discount and purchased handheld for students unable to purchase their own; or the school has required the purchase of a handheld as a school supply.

**Table 5: Ownership model based on Williams (2006)**

Based on the previous ownership models, the most suitable models to be applied in implementing mobile learning in Malaysian schools are Personal Use Strategies: Full personal use (Vahey and Crawford, 2002), School and Home Use, and Ownership (Williams, 2006). These ownership models would provide full access to the devices. Moreover, students would also be able to take the mobile devices home. Full access to the devices is important because the mobile lessons proposed in this study are projected to be delivered regularly after school hours. As stressed by Vahey and Crawford (2002), a full personal access strategy is strongly recommended for instructional activities which require students to have continuous access to devices, for example mobile lessons which are delivered based on a schedule.

The proposed ownership models for mobile learning in Malaysian secondary schools are called Ownership and Loanership. The Loanership model is recommended for students who cannot afford to purchase the devices. Parents and students are required to sign an agreement indicating their responsibilities for the

devices (Pownell and Bailey, 2003; K-12 Handhelds Official Website). The responsibilities might include an agreement to take proper care of the devices, an agreement to pay for damage or loss and an agreement to return the devices to school in good condition during school holidays or when the students transfer to other schools. This model could be seen as similar to the “Text Book Loan Scheme” in Malaysian schools (Textbook Division Official Website), where students are expected to be responsible for the loan textbooks. The Ownership model is recommended for students who can afford to purchase the devices. In this scheme, parents are encouraged to contribute by paying monthly or annual instalments. Previously, Deneen and Allert reported a purchase scheme applied in a mobile learning implementation at the University of Minnesota, Duluth (Deneen and Allert, 2003).

Parents and students are required to sign an agreement to contribute towards additional costs that might be occurring as recommended by Pownell and Bailey, (2003) and K-12 Handhelds Official Website. These may include payment in the management and maintenance of the device, insurance, additional warranty coverage, accidental damage protection and repair costs.

This subsection discusses the possible ownership models to support the acquisition of mobile devices. Regardless of the ownership model, there are ethical responsibilities that should be fulfilled by students when using mobile devices for learning purposes. These are reflected in the Acceptable Use Policy (AUP). The following subsection proceeds with a discussion on the development of the Acceptable Use Policy (AUP).

### **Acceptable Use Policy (AUP)**

In dealing with intentional and unintentional misuse of mobile technologies, schools ought to establish an Acceptable Use Policy (AUP), which will consist of rules to guide students (Bonifaz and Zucker, 2004; Vahey and Crawford, 2003; Ellie, 2005; Attewell *et al.*, 2010). The significance of the Acceptable Use Policy (AUP) runs parallel to the opinion expressed by Hartnell-Young (2008), who stressed the importance of student management strategies to ensure that students use mobile phones productively for learning purposes. Previous projects have proved that the

development of an Acceptable Use Policy (AUP) is an integral part of utilising mobile technologies in teaching and learning (Juvy and Carino, 2007; Williams, 2006; Pownell and Bailey, 2003; Shepparton High School Official Website).

Improper use of mobile devices would have an impact on security, safety and ethics. These issues have been discussed in Mobile phones in Malaysian schools: challenges. An Acceptable Use Policy (AUP) would help to increase students' awareness of the proper and improper use of the devices, and it may prevent them from behaving inappropriately. In addition, the Acceptable Use Policy would be useful for parents in guiding their children in the use of the mobile devices.

Some of the inappropriate behaviours pertaining to the use of mobile phones which ought to be defined in the Acceptable Use Policy (AUP) include the following: sending malicious content or messages to other people; sending abusive or harassing messages to other people; installing unauthorised programs; vandalising or stealing data or devices; accessing illegal or inappropriate content; and using devices in an inappropriate manner which causes damage (Williams, 2006; Pownell and Bailey, 2003; Pownell and Bailey, 2001). There might also be a need to highlight the consequences of the misconduct, which would apply in conjunction with the existing rules and regulations in schools. In Malaysia, possible consequences might include verbal warnings, official warnings, caning, school suspension and school expulsion as highlighted by Kiblah Secondary School Official Website on Rules and Regulations. To indicate that they understand the rules of the Acceptable Use Policy (AUP), an approach could be to request students and parents to sign a document, which would be known as a Consent and Waiver Form.

This subsection discusses the initial development of the Acceptable Use Policy (AUP) established in the study. The Acceptable Use Policy (AUP) would help to address the issue of the implications for the students of improper use of mobile technologies in terms of security, safety and ethics. Apart from the policy, management and maintenance procedure is also necessary to support the utilisation of mobile learning in schools. The following subsection proceeds with a discussion of the management and maintenance procedure.

## Management and maintenance

Management and maintenance procedure is important in the utilisation of mobile learning to prevent loss, damage and theft (Ellie, 2005; Hartnell-Young, 2008). However, in the reports by McFarlene *et al.* (2007) and Vahey and Crawford (2002), such cases rarely occur. Nonetheless, schools ought to apply the management and maintenance procedure to prevent any such cases from occurring. It would be beneficial to apply management and maintenance procedures that are in accordance the culture and financial situation in Malaysian schools. Most importantly, the procedure should not overwhelm the school management and other stakeholders such as students and parents. The following table summarises the management and maintenance procedure which should be considered for mobile learning utilisation in Malaysian schools (K-12 Handhelds Official Website; Bonifaz and Zucker, 2004; Zucker, 2005; McFarlene *et al.*, 2007).

(i)	All loan devices should be marked permanently with unique serial numbers and other details such as the school's name, identification code or bar code.
(ii)	The school should keep a systematic inventory of the device for easy identification. This is useful so that the device can be returned to its owner in the event of lost or misplaced.
(iii)	Devices should be equipped with a protective case to provide proper protection and to help reduce the incidence of breakage. Engraving the name of the school and the owner of the devices on the protective case are also recommended.
(iv)	In order to make sure that teaching and learning process are not interrupted while the devices are being sent for repair, school should provide temporary supplies or loan stock of the devices.
(v)	The school should also need to determine where to send the devices for repair in case of faults.
(vi)	It is also useful to consider adopting mobile devices tracking systems, which will track and recover stolen or missing mobile devices.

**Table 6: Management and maintenance of the K-12 Handhelds Official Website, Bonifaz and Zucker (2004), Zucker (2005), McFarlene et al. (2007)**

This subsection discusses the management and maintenance procedure which ought to be considered for mobile learning utilisation. It would help to prevent loss, damage and theft. Even though the management and maintenance procedure is in place, there is also a need to assume and assign specific roles to support the implementation. The next subsection proceeds with a discussion on the specific roles established in the study.

## Specific roles allocation

For technology integration in schools, it is important to assume or assign specific roles to support the implementation (Ellie, 2005; Naismith *et al.*, 2004). Specific roles which have been highlighted in the initial version of the implementation strategy are technical support staff, ICT coordinator and English subject leader.

Hsueh (2011) stressed the importance of technical support in mobile learning programmes. One of the reasons for teachers' resistance to technology is the lack of technical support (Becta, 2003; Cox *et al.*, 1999; Rodriguez and Knuth, 2000). The stresses and setbacks incurred when dealing with technical problems affect not only the teachers but also the students (Hsueh, 2011). From the literatures, it is worth noting that technical support is the foundation for ensuring the success of the technology integration, not only for the use of the desktop computers but also for other teaching and learning tools. Teachers would appreciate receiving support when dealing with technical problems

In light of the issue, there are several key roles for the technical support staff which may need to be recommended in implementing mobile learning. These are to perform comprehensive management and maintenance of the facilities in the implementation, to report any technical problem for the ICT coordinator and to provide on-going support to English Language teachers and students throughout the implementation.

Another important role in the implementation of mobile learning in Malaysia is that of the English subject leader. The Department for Children, Schools and Families (Department for Children, Schools and Families on English subject leader) provide guidelines on the role of the English Subject Leader. Based on the guideline, there are several key roles for the English subject leader which may need to be considered. These are to coordinate mobile learning implementation and ensure that English Language teachers conduct mobile learning and teaching according to the structure and syllabus as instructed by the Ministry of Education, Malaysia. In addition, they would be responsible for monitoring and evaluating students' progress, auditing, informing the school principal regarding the progress of the implementation, and encouraging and providing on-going support for English Language teachers throughout the implementation.

ICT coordinator is another key role in supporting mobile learning. As for the role of ICT coordinator, there is a guideline provided by the Department for Children, Schools and Families (Department for Children, Schools and Families on ICT coordinator). Parallel to the guideline, there are several key roles for the ICT

coordinator which may need to be considered. These are to coordinate the management and maintenance of the technology, liaise with the Ministry regarding the implementation, inform the school principal regarding technical issues in the implementation, and supervise the technical support staff.

This subsection discusses the specific roles which ought to be considered in implementing mobile learning. Despite the specific allocation of roles to support the implementation, support for major stakeholders is also important. Stakeholders are the people who will be involved directly and indirectly in the implementation, such as teachers, students and parents. The next subsection proceeds with a discussion on the support for major stakeholders, as proposed for the implementation.

### **Support for major stakeholders**

In implementing mobile learning in schools, it appears that it is necessary to provide support to teachers, students and parents to ensure the success of the implementation. The significance of providing support for teachers in the utilisation of mobile technologies at schools is stressed in many studies (Ellie, 2005; Naismith et al., 2004; Pownell and Bailey, 2001; Pownell and Bailey, 2003; Juvy and Carino, 2007; Attewell, 2005; Hsueh, 2011). The present literatures try to stress that training is necessary not only to prepare teachers with the knowledge and skills, but also to initiate positive attitudes towards mobile technologies. This concurs with the opinion of the Hartnell-Young and Heym (2008) that “Teachers need to be trained in order to be able to see these phones as learning devices instead of a distraction.” It can be understood that through training, teachers would value the significance of deploying mobile phones in education which could eventually change their attitudes towards such usage.

In Malaysia, it can be seen that the government provides training for teachers to ensure that they are competent in using technology. Teachers are trained to be knowledgeable and skillful in ICT through government bodies such as Teachers Training Division and Aminuddin Baki Institute (Abdullah, 2006; Abd. Rahman, 2004). The government also applies a cascade model to train teachers; selected individuals are trained in ICT to become teachers’ champions, going on to train other teachers (Gutterman *et al.*, 2009). As suggested by Bonifaz and Zucker

(2004) and Gateway (2008), partnerships with local universities, educational organisations and other institutions are also encouraged in order to gather expertise and assistance for training purposes. In Malaysia, besides government bodies, teachers' training courses are also conducted by local universities (Siraj, 2004). The literatures in this paragraph are an indicator of the significance of training in the ICT integration in Malaysian schools, hence, it would be the same when implementing mobile learning.

Another approach in supporting teachers could be to allocate sufficient time for the teachers to become familiar with the technology before the implementation. As reported by Bonifaz and Zucker (2004) and Gateway (2005), teachers were provided with the devices one year before the implementation so that, by the time they actually used the devices, they felt confident. Moreover, McFarlene *et al.* (2007) and Mifsud (2003) stressed that teachers appreciate being given time to explore the mobile devices before the implementation. Therefore, it can be concluded that it is beneficial to provide hands-on learning, to enable teachers to explore the appropriate uses of mobile phones in education.

However, with regard to mobile phones, teachers might already be familiar with the devices. Thus, a better approach would be to emphasise on the skills required to deploy mobile lessons in accordance with pedagogy, rather than concentrating on technical issues. This appears to be in accordance with the opinion by Hsueh (2011) that teachers should be trained to integrate pedagogy, content and technology in order to ensure the effectiveness of mobile learning. In addition, professional development for teachers ought to be continued from time to time. When the integration of technology is in place, on-going support ought to be provided as highlighted by Finn and Vandenharn (2004) and Livingston (2006). It appears that follow-up and on-site support is important to help teachers with concerns arising from the implementation. In addition, peer support from teachers' champions is also valuable (Pownell and Bailey, 2003). An explanation of this approach would be that for some teachers might feel more comfortable seeking assistance from their colleagues.

Support for students is also an integral part of the implementation. There is a need to prepare students with a proper attitude, sufficient knowledge and skills required for the implementation. An approach could be through induction sessions. This might involve an explanation of the objective of the implementation and the skills required to use the devices, as well as safety, security and ethical issues associated with the use of the mobile devices as highlighted by Williams (2006).

Students are always assumed to be light years ahead with technology compared to teachers (Prensky, 2001). They are familiar with technologies and can be regarded as flexible learners. Therefore, the importance of induction for students might be disputed. However, as stressed by Attewell *et al.* (2009), the status of “digital natives” often attributed to students does not mean that they would require little or no support in mobile learning programmes. Whatever the situation, Hsueh (2011) suggested that facilitation or mini-training should be provided for students to implement mobile learning. At the beginning of the implementation, it would be beneficial to consider induction sessions to provide awareness to the students regarding the benefits and objectives of the implementation, and the knowledge and skills required in implementing mobile learning. There may also a need to inform them about safety, security and ethical issues surrounding the use of mobile devices to enable them to apply the understanding in practice. This recommendation appears to bring impact in safeguarding students’ well-being by enabling them to make appropriate decisions when dealing with issues related to technologies. After the implementation has taken place, students should be provided with on-going support from teachers and technical support staff to foster motivation throughout the implementation as suggested by Hsueh (2011).

In addition to teachers and students, support should also be provided for parents. Support for parents is important to ensure that parents are well-informed about the implementation which will eventually foster their support. As stressed by Ellie (2005, p. 41), “The fundamentals for a one-on-one m-learning programme can be summarised as follows: .....ensure parent and community participation and liaison”. Hartnell-Young and Heym (2008) stressed the importance of informing parents about the use of mobile phones to achieve learning objectives and of involving them in establishing appropriate ownership, management and ethical

arrangements. These do imply an expectation that involving parents in the implementation of mobile learning is important. There are consequences when parents are not informed or ill-informed about the implementation. They might react negatively or show resistance (Rodriguez and Knuth, 2000). Therefore, as suggested by McFarlene *et al.* (2007), preparation is needed to handle parental concerns or opposition to mobile learning implementation.

Regarding the support for the parents, Duncan (2009) stressed the importance of briefing sessions for the parents. Reflecting on the literature, it can be understood that through briefing sessions, parents could be informed about the objective, policy, procedure and their roles in the implementation. Parents could also be informed about the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to monitor their children, ensuring they use mobile devices productively. This approach might be considered as important to address the issue of the negative implications of mobile technologies for their children. Previously, McFarlene *et al.* (2007) reported that parents' evenings were conducted to provide information about mobile learning projects. In Maine and Henrico County in the United States, parents are expected to attend a 90-minute training session before one-to-one computing implementation (Bonifaz and Zucker, 2004). As such, it is also important to organise briefing sessions according to parents' availability. For example, Henrico School conducted information events several times during the day so that parents had the opportunity to attend the sessions (Bonifaz and Zucker, 2004). Issues which should be raised during parents' evenings are summarised in the next table (Gateway, 2005; Gateway, 2008):

(i) Inform parents that their children will be using a mobile device
(ii) Explain that the meeting provides students and parents an opportunity to ask questions, sign acceptable use policy documents, collect insurance fees and share other information.
(iii) Provide demonstrations at the meeting on how to care for the devices.
(iv) Discuss rules and regulations and distribute handouts to each parent and child along with a Frequently Ask Question (FAQ) sheet on the expected care of the equipment.
(v) Train parents on basic technical skills and inform them about the code of conduct and rules involved

**Table 7: Issues which should be highlighted in parents' evenings based on (Gateway, 2005; Gateway, 2008)**

After the implementation has taken place, there may be a need to inform parents about their children's progress from time to time. This is parallel to the statement by Garton (2003) that parents should be encouraged to become closely involved in the learning activities as well as being informed of their children's progress in the

utilisation of the devices. It also has other practical implication, students are likely to utilise the devices efficiently when their parents are supportive and actively involved as reported by Becta (2004).

This subsection discusses the support measures for major stakeholders which ought to be considered in implementing mobile learning. Support for teachers and students are important so that they will be well-informed regarding the objective of mobile learning and feel confident about using the devices, which will finally initiate a positive attitude towards the implementation. Providing support for parents is also important to address the issue of the negative implications of mobile technologies for students and to ensure that parents are well-informed about the implementation which will foster their support. The next subsection continues with a summary of this section.

### **Summary**

This section describes the themes that underpinned the development of the implementation strategy to support mobile learning utilisation in Malaysian secondary schools. The implementation strategy is formulated to complement the existing practices in Malaysian secondary schools. In the final stage of the study, the implementation strategy is disseminated and distributed to the officers in the Ministry of Education, Malaysia to establish the feasibility to complement the existing practices in Malaysian schools. The first part of the implementation strategy is mobile technology integration, which established the mobile lessons and the infrastructure associated with the implementation. The second part in the implementation strategy provides an overview of the initial development of the policy and procedures.

With regard to the mobile lessons, it is essential to ensure that the mobile lessons established in the study are pedagogically sound for vocabulary learning and can be integrated in the English Language subject in Malaysian schools. It is also necessary to propose a strategy for acquiring the facilities and to formulate ownership models to ensure that students can acquire mobile devices. Regardless of the strategy in acquiring the facilities, there are ethical responsibilities that should be fulfilled by students when using mobile devices for learning purposes. Students

might be affected by the negative implications of using mobile devices if there is no guidance. This is where an Acceptable Use Policy (AUP) could help in eliminating negative implications. Apart from the policy, management and maintenance procedure is also necessary to support the utilisation of mobile learning in schools. It would help to prevent loss, damage and theft. Even though the management and maintenance procedure is in place, there is also a need to assume and assign specific roles such as technical support staff, ICT coordinators and English subject leaders to support the implementation. Despite the specific allocation of roles to support the implementation, support for major stakeholders is also important. Stakeholders are the people who will be involved directly and indirectly in the implementation, such as teachers, students and parents. Support for teachers and students are important so that they will be well-informed regarding the objective of mobile learning and feel confident about using the devices, which will finally initiate a positive attitude towards the implementation. Providing support for parents is also important to ensure that they are well-informed about the use of mobile phones in education which would eventually foster their support towards the implementation.

This section only discusses the basis of the initial development of the implementation strategy which was highlighted in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The implementation strategy developed evolved over the period of this study based on the evaluation by the respondents. Two sections which are called “Evaluation of the implementation strategy: preliminary field tests” and “Evaluation of the implementation strategy: main field tests” discuss the findings from the field tests which determine the final version of the implementation strategy. The next chapter proceeds with the research methodology applied in this study.



## **Chapter 3: Research methodology**

### **Educational Research and Development (ER&D)**

This chapter discusses the research methodology underpinning this study. It has been established that the Educational Research and Development (ER&D) approach is based on educational evaluation by Borg and Gall (1979). In understanding the position of educational evaluation in educational research, the features of educational research and educational evaluation are compared and contrasted. The differences and similarities between educational evaluation and educational research are discussed before an overview of the Educational Research and Development (ER&D) approach is provided.

According to Gall *et al.* (2007), it is highly unlikely that a graduate student will be able to complete a major Educational Research and Development (ER&D) project because of the limitations in terms of finance, manpower and time. But despite the challenges, some studies based on the Educational Research and Development (ER&D) approach has been conducted by graduate students (Borg and Gall, 1983). As advised by Gall *et al.* (2007), some of the steps of the Educational Research and Development (ER&D) approach are modified or omitted in the studies to address the challenges. This chapter provides an overview of the studies.

This chapter also includes a justification for applying the method. Another viable approach was considered - action research - which is similar to the Educational Research and Development (ER&D) approach with regard to the guided processes involved and the purpose. However, the Educational Research and Development (ER&D) approach is more appropriate for this study because it has a specific model which supports an educational product development.

A section describing the steps applied in this study based on the Educational Research and Development (ER&D) approach is also included. The steps are based on the ten-stage model proposed by Borg and Gall (1979) and the ten-stage model proposed by Dick and Carey (1978). Both models are considered and customised.

This chapter closes with a discussion of the research design based on the Educational Research and Development (ER&D) approach. These are research and information gathering, planning, developing the product in preliminary form, preliminary field testing or first formative evaluation, main product revision, main field testing or second formative evaluation, final product revision and, finally, the dissemination and distribution.

### **Overview**

The research design of this study is based on the Educational Research and Development (ER&D) approach by Borg and Gall (1979). It is an approach that falls under the umbrella of educational evaluation. Educational evaluation is defined as the process of making judgements about the merit, value or worth of educational programs (Gall *et al.*, 2007). The significance of educational evaluation in education is that it is particularly important to policy makers, program managers and curriculum developers (Gall *et al.*, 2007).

Educational evaluation and educational research have several differences and similarities. These are based on the purpose, generalisation and findings. Educational evaluation is termed as applied research while educational research is termed as pure research. The following table summarises the differences and similarities between educational evaluation and educational research (Gall *et al.*, 2007). However, as described by Gall *et al.* (2007), educational research and educational evaluation are mostly intertwined. In practice, when conducting educational evaluation the researcher applies most of the same research designs, measurement tools, and data analysis methods which constitute the methodology underpinned in educational research. Thus, Gall *et al.* (2007) referred to educational evaluation as evaluation research.

	<b>Educational evaluation</b>	<b>Educational research</b>
<b>Purpose</b>	To collect data that will facilitate the decision to be made concerning policy, management, or political strategy. However, the finding from educational research can also be used in decision making.	To develop an understanding of a particular phenomena. However, the finding from educational evaluation can also develop an understanding of a particular phenomenon.
<b>Generalisation</b>	Conducted for a very specific purpose such as examining how well particular programme works. However, some educational evaluations are designed to yield widely generalisable findings.	Conducted in discovering generalisable relationship among variables or in discovering the meaning that individuals or groups ascribe to social reality. However, some educational research has limited generalisability.
<b>Findings</b>	Designed to yield data concerning the worth, merit, or value of educational phenomena.	Designed to discover the essential characteristics of educational phenomena.

**Table 8: Comparison of educational evaluation and educational research based on Gall et al. (2007)**

Borg and Gall (1979) introduced the Educational Research and Development (ER&D) approach to develop and validate educational products, where formative and summative evaluation play major roles. Formative evaluation is conducted while the program or product is under development whereas summative evaluation is conducted to determine the worthiness of the final program or product (Gall *et al.*, 2007). As posited by Gall *et al.* (2007), the Educational Research and Development (ER&D) approach is based on the industry development model and the findings of the research are utilised to develop new products and procedures. This approach consists of rigorous steps for product development. According to Borg and Gall:

The steps of this process are usually referred to as the R&D cycle, which consists of studying research findings pertinent to the product to be developed, developing the product based on these findings, field-testing it in the setting where it will be used eventually, and revising it to correct the deficiencies found in the field-testing stage (Borg and Gall, 1983, p. 772).

As defined by Borg and Gall (1983), the word “product” refers not only to material objects but also to procedure and processes. In this study, an implementation strategy to implement mobile learning is developed, evaluated and disseminated. Implementation strategy is a “product” which supports mobile learning

implementation in Malaysian secondary schools. The approach enables the researcher to evaluate the implementation strategy through a series of field tests based on the perspectives from the educational experts in secondary schools in the United Kingdom followed by Malaysia. It is the outcome of this study that the implementation strategy is validated or modified as a result of consultation from these ranges of stakeholders and experts in education before disseminating it to the officers in the Ministry of Education, Malaysia. While evaluating and disseminating the implementation strategy, the field tests also provide the opportunity to explore the respondents' perspectives about the issues associated with the implementation of mobile learning in Malaysian schools.

This section provides an overview of the educational evaluation which is the basis of the Educational Research and Development (ER&D) approach. The differences and similarities between educational evaluation and educational research are discussed. In addition, an overview of the Educational Research and Development (ER&D) approach is presented. Regardless of the systematic steps supporting product development in the Educational Research and Development (ER&D) approach, the rarity of this approach in graduate students' projects is apparent. The reasons are discussed in the next section. In addition, examples of educational products development through this approach are also explored.

### **Previous research**

Although the Educational Research and Development (ER&D) approach provides a systematic model for educational product development, it might be a challenge for graduate students to apply this approach. As implied by Borg and Gall (1983), it is almost impossible for a graduate student to obtain the considerable amount of finance, manpower and time required to complete a product developed through this approach. Borg and Gall (1983) only recommended this approach to graduate students determined to make a significant impact on improving educational practice. However, a feasible way to apply this approach for a master's or doctoral degree is to limit the process by adopting just a few of the steps in the approach (Gall *et al.*, 2007).

Despite the challenges, there are some projects conducted by graduate students based on this approach. The examples are presented in reverse chronological order. As advised by Borg and Gall (1983), the researchers limited the scopes of their projects by applying just a few steps from the total number of steps of this approach. An example of a product developed through this approach is a handbook entitled "Handbook for Museum Professionals and Educators" by Ann Elliott (Elliott, 2007). Instead of ten steps, Elliott limited her research to just eight steps, the project being conducted without operational field-testing and final product revision.

Another example of a product developed through this approach is a book entitled "Administrative Solutions for Handheld Technology in Schools" by David William Pownell and Gerald D. Bailey (Pownell and Bailey, 2003). The book is based on a doctoral dissertation by David William Pownell entitled "Implementing Handheld Computers in Schools: The Research, Development, And Validation of a Technology Leader's Resource Guide" (Pownell, 2002). To deal with time constraints, Pownell omitted the operational field-testing and final product revision.

A history textbook and a teachers' guidebook were also produced by adopting this approach in a dissertation entitled "The development and validation of a high school textbook on the ancient Chamorros of Guam" by Lawrence Cunningham (Gall *et al.*, 1996). Lawrence limited the scope of his dissertation to one chapter of the textbook and one section of the teachers' guidebook.

Dan Isaacson also applied the Educational Research and Development (ER&D) approach to his doctoral dissertation entitled "Discovering the Microcomputer as an Instructional Media Tool in Teaching: A Laboratory for Elementary and Secondary Educators" (Borg and Gall, 1983). To make this approach feasible for his study, he limited the process to just eight steps. He carried out the dissemination of his product without conducting operational field-testing and final product revision.

This section has established a possible way to apply the Educational Research and Development (ER&D) approach regardless of the challenges in terms of finance, manpower and time. Some examples of graduate students' projects which applied this approach are discussed. The examples range from a project in the 1980s to the

latest project in 2007. The next section continues with a justification for applying this approach to underpin the study.

### Justification

In developing an implementation strategy for mobile learning implementation in Malaysia it is important to apply a research method that provides a systematic model for product development. The literature review established that the Educational Research and Development (ER&D) approach and action research have similarities. As defined by Isaac and Michael (1997), the purpose of action research is “to develop new skills or new approach to solve problems with direct application to the classroom or working world setting”. The words “skills” and “approaches” are parallel to the word “product” which is defined in the Educational Research and Development (ER&D) approach. Both methods involve rigorous processes (Borg and Gall, 1983; Gall *et al.*, 2007). The following diagrams depict the processes of action research and the Educational Research and Development (ER&D) approach.

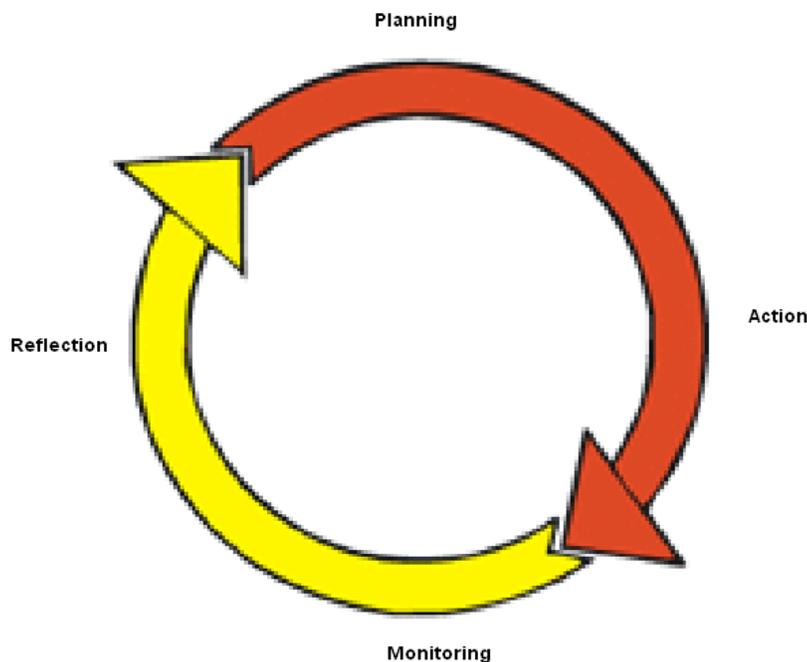
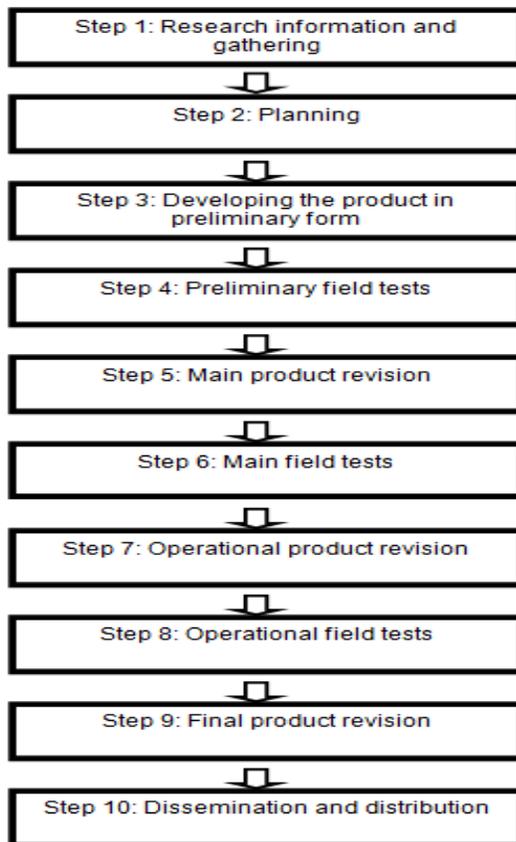


Figure 13: Processes in action research



**Figure 14: Processes in Educational Research and Development (ER&D)**

Compared to the Educational Research and Development (ER&D) approach, researchers are not restricted to carrying out the steps in the same sequence in action research. The researchers might return to earlier stages when progressing and they might continue through the stages, then ending the research (Gall *et al.*, 2007). Adam (2006) discussed the steps of action research:

..... be prepared to find fuzzy edges between the stages as your inquiry proceeds. For a start, you will probably not start with planning; there may be much monitoring and observation of existing practice (reconnaissance) before you are ready to plan and implement a change (Adam, 2006).

It has also been established that the sequence of the steps in the Educational Research and Development (ER&D) approach is linear, while in action research the sequence of the steps involves a spiral or cyclical approach. The cyclical approach

or spiral in action research provides the flexibility to the researchers but the unpredictable flow of the research process. On the other hand, the linear approach in Educational Research and Development (ER&D) approach guide the researcher with a series of rigorous steps but the predictable flow of the research process. Despite this difference, the Educational Research and Development (ER&D) approach is similar to action research because both methods are underpinned by guided processes and are based on similar purposes.

The Educational Research and Development (ER&D) approach is based on the ten-stage model in educational product development by Dick and Carey (1978) and Borg and Gall (1979). The application of the ten-stage model provides the opportunity to translate the research findings into educational products to be used in the field. Compared to the Educational Research and Development (ER&D) approach, the steps in action research do not involve a specific model which would support an educational product development. Therefore, based on the above justification, the Educational Research and Development (ER&D) approach is more appropriate to develop an implementation strategy for mobile learning utilisation in Malaysian schools. Moreover, the strength of this method for product development is that it has rigorous and systematic steps for product development and evaluation. This approach has two or more repeated steps in field tests which would serve as an assurance to determine the quality of products developed (Borg, 1981). The systematic steps in Educational Research and Development (ER&D) approach underpin the development, evaluation and dissemination of the implementation strategy. Besides, issues associated with mobile learning implementation can also be explored through the series of field tests in Educational Research and Development (ER&D) approach.

This section has discussed the justification for applying the Educational Research and Development (ER&D) approach. The action research method has been examined for comparison purposes and it has been established that it is similar to the Educational Research and Development (ER&D) approach with regard to the guided processes involved and the purpose. However, the Educational Research and Development (ER&D) approach is more appropriate for this study because it offers a specific model which supports an educational product development. As

discussed, the ten-stage model proposed by Dick and Carey (1978) and Borg and Gall (1979) underpins the Educational Research and Development (ER&D) approach. The next section explores both models to be customised in this study.

### Research design

Borg and Gall (1979) described the ten steps in Educational Research and Development (ER&D) through the development of *The Minicourse: A Microteaching Approach to Teacher Education*. The steps are depicted in the following table (Borg and Gall, 1979).

Steps in Educational Research and Development (ER&D)	Examples of action
(1) Research and information collecting	Includes review of literature, classroom observation, and preparation of report of state of the art.
(2) Planning	Includes defining skills, stating objectives, determining course sequence, and small scale feasibility testing.
(3) Develop preliminary form of product	Includes preparation of instructional materials, handbooks, and evaluation devices.
(4) Preliminary field testing	Conducted in 1 to 3 schools, using 6 to 12 subjects. Interview, observational and questionnaire data collected and analysed.
(5) Main product revision	Revision of product as suggested by the preliminary field-tests results.
(6) Main field testing	Conducted in 5 to 15 schools with 30 to 100 subjects. Quantitative data on subjects' pre course and post course performances are collected. Results are evaluated with respect to course objectives and are compared with control group data, when appropriate.
(7) Operational product revision	Revision of the product as suggested by main field-tests results.
(8) Operational field testing	Conducted in 10 to 30 schools involving 40 to 200 subjects. Interview, observational and questionnaire data collected and analysed.
(9) Final product revision	Revision of product as suggested by operational field-test results.
(10) Dissemination and distribution	Report on the product at professional meetings and in journals. Work with publisher who assumes commercial distribution. Monitor distribution to provide quality control.

**Table 9: Steps in Educational Research and Development (ER&D) based on Borg and Gall (1979)**

Dick *et al.* (2005) also proposed ten steps to support product development. The steps include the following: identify instructional goals; conduct instructional analysis; analyse learners and contexts; write performance objectives; develop assessment instruments; develop instructional strategy; develop and select instructional materials; design and conduct formative evaluation of instruction; revise instruction and design; and conduct summative evaluation.

There are similarities between the two models. Both models are based on similar stages in educational product development which are planning, developing, evaluating and re-evaluating. Borg *et al.* (1993) took a similar view and stressed that the ten steps, which are proposed in the Educational Research and Development (ER&D) approach, were based on the ten-stage model proposed by Dick and Carey (1978). However, in the model proposed by Dick and Carey (1978), the dissemination and distribution stage is not included. The similarities between the two models are summarised in the following table.

Stages in product development	Ten-stage model by Borg and Gall (1979)	Ten-stage model by Dick and Carey (1978).
Planning	(1) Research and information collecting (2) Planning	(1) Identify instructional goals (2) Conduct instructional analysis (3) Analyse learners and contexts (4) Write performance objectives (5) Develop assessment instruments
Developing	(3) Develop preliminary form of product	(6) Develop instructional strategy (7) Develop and select instructional materials.
Evaluating	(4) Preliminary field testing (5) Main product revision (6) Main field testing	(8) Design and conduct formative evaluation of instruction.
Re-evaluating	(7) Operational product revision (8) Operational field testing (9) Final product revision	(9) Revise instruction (10) Design and conduct summative evaluation.

**Table 10: The similarities of steps in Borg and Gall (1979) and Dick and Carey (1979)**

In this study, the steps are adapted from both models. The steps applied in this study are research and information-gathering, planning, developing the product in preliminary form, preliminary field-testing or formative evaluation, main product revision, main field-testing or summative evaluation, final product revision, and dissemination and distribution. To deal with the time constraints, the operational product revision and operational field-testing are omitted. The steps applied in this study are depicted in the next figure.

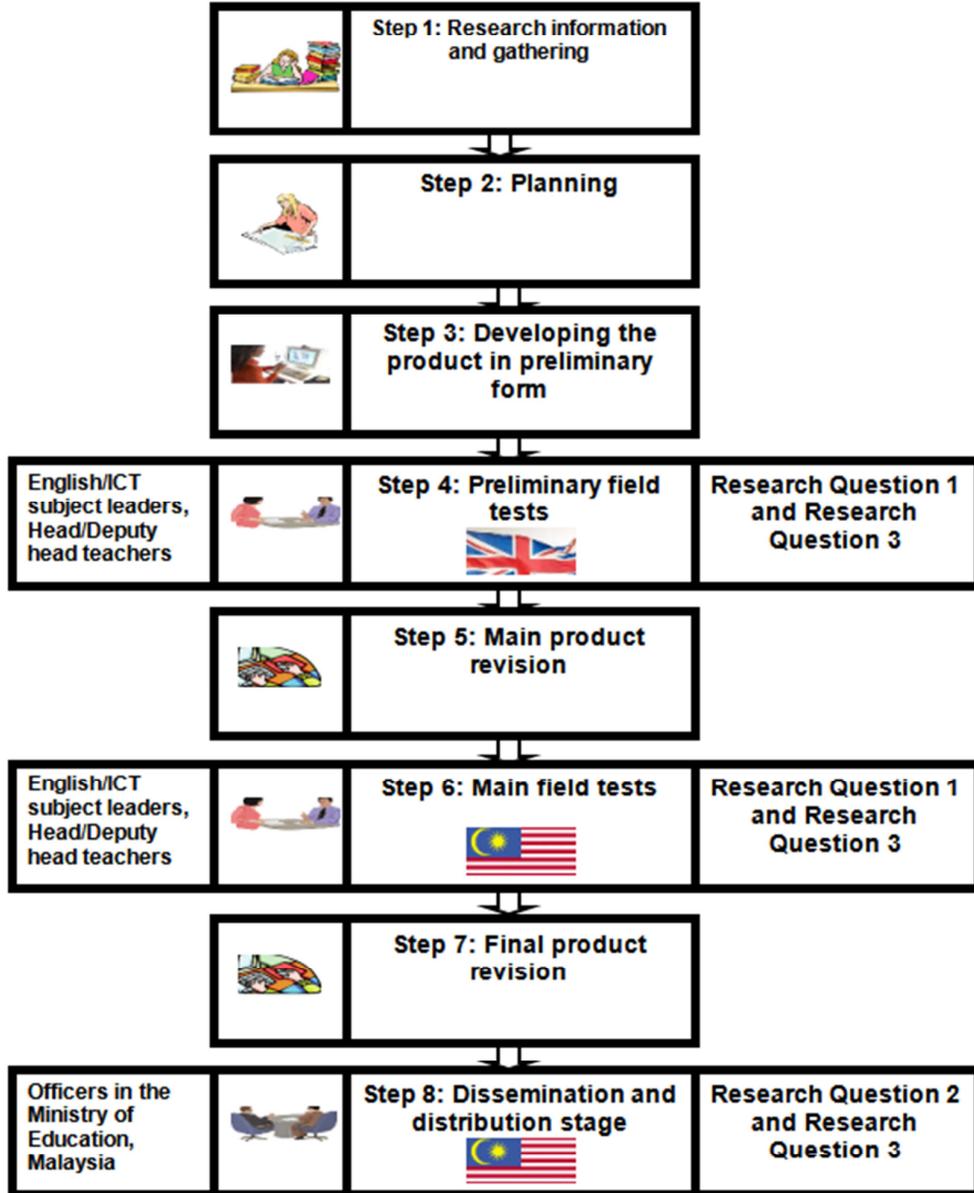


Figure 15: Steps in Educational Research and Development (ER&D) adopted in the study

This section has discussed the steps which are customised based on the ten-stage model proposed by Dick and Carey (1978) and Borg and Gall (1979). These are research and information-gathering, planning, developing the product in preliminary form, preliminary field-testing or formative evaluation, main product revision, main field-testing or summative evaluation, final product revision, and dissemination and distribution. The next section continues with a discussion of the study based on the steps involved.

## **Implementation**

This section discusses the steps applied in this research. The steps are as follows Step 1: Research and information-gathering; Step 2: Planning; Step 3: Developing the product in preliminary form; Step 4: Preliminary field-testing/ formative evaluation; Step 5: Main product revision; Step 6: Main field-testing/summative evaluation; Step 7: Final product revision; and Step 8: Dissemination and distribution.

### ***Step 1: Research and information-gathering***

The significance of developing an implementation strategy to utilise mobile learning in Malaysian secondary schools was established during the literature review. The literature review has established the growing interest in mobile learning in Malaysia. A popular research area is the development of mobile applications for Malaysian students (Salam *et al.*, 2008; Mahamad *et al.*, 2008; Shiratuddin and Zaibon, 2009). In addition, there are studies in developing a mobile learning curriculum for Malaysian secondary schools (Siraj and Saleh, 2003; Siraj, 2004; Shuib, 2009). However, no literature has yet highlighted the strategy to implement mobile learning in Malaysian secondary schools. Thus, an implementation strategy was developed specifically for the use in the Malaysian Educational System.

In seeking to implement mobile learning in Malaysian secondary schools, it is also important to establish the potential of implementing mobile learning to complement the existing practices in Malaysian schools. Therefore, this study was also conducted to establish the following key points: the potential of mobile phones to add value to English Language learning; the potential of mobile phones to complement the government vision's to utilise ICT and mobile technologies; and the potential of mobile phones to become an alternative teaching and learning device. It has also been established that there are emerging themes in regard to implementing mobile learning in mainstream schooling in general (Hartnell-Young and Heym, 2008). Nevertheless, no study has yet explored the emerging themes in regard to implementing mobile learning in Malaysian secondary schools. Therefore, this study was also aimed at shedding light on the situation regarding the utilisation of mobile phones in Malaysian schools.

## ***Step 2: Planning***

In light of the research gap established through the literature review, an implementation strategy for implementing mobile learning in Malaysian secondary schools was aimed to be developed. The implementation strategy was formulated by taking into consideration the following matters: (i) Existing policy of the Ministry of Education, Malaysia, to deploy ICT in teaching and learning; (ii) Vision of Malaysian Smart School implementation to deploy ICT, which also includes mobile technologies; (iii) Justification from the literature relating to handheld technologies' and mobile technologies' integration in schools worldwide; (iv) Opinion from experts in education in the United Kingdom including English subject leaders, ICT subject leaders and stakeholders from school management such as head teachers and deputy head teachers; and (v) Opinion from experts in education in Malaysia including English subject leaders, ICT subject leaders, stakeholders from school management such as head teachers and deputy head teachers, and officers from the Ministry of Education, Malaysia. Besides providing opinions regarding the development of the implementation strategy, the experts in education also give their perspectives on implementing mobile learning in Malaysian schools.

The development of the implementation strategy began by defining the objective and the content. The objective of the implementation strategy is to establish guidance to utilise mobile learning in Malaysian schools in the future. Regarding the content, the implementation strategy is divided into two parts. The first part explores the mobile technology integration into the curriculum. It consists of an overview of the mobile lessons and infrastructure. The second part explores the policy and procedure in implementing mobile learning in Malaysian schools.

In conducting the research, field tests were scheduled at times most convenient for the respondents. Field tests were also scheduled based on school term timetables in the United Kingdom and Malaysia. To ensure that this study conforms to the ethical guidelines of the University of Southampton, an intensive process of ethical review was conducted in January 2009. The process was conducted by following the Ethics and Governance Review Procedure of the School of Education, University Of Southampton. For those parts of the study conducted in Malaysia, an ethics review was authorised by the Economic Planning Unit, Malaysia (Economic

Planning Unit, Malaysia Official Website). In addition, permission from Terengganu State Educational Department was obtained for the main field tests (Terengganu State Education Department Official Website). Finally, permission from the Ministry of Education, Malaysia, was obtained for the dissemination and distribution stage (Ministry of Education, Malaysia Official Website). Before the field tests, the implementation strategy, which was documented in a handbook called “Mobile learning in English Language: An implementation strategy for secondary schools in Malaysia” as Appendix A to Appendix C was given to the respondents. This approach provided an overview of the implementation strategy and the nature of the study.

This study gathered opinions from experts in education regarding the development of the implementation strategy as well as their perspectives on implementing mobile learning in Malaysia. Experts in education are English subject leaders, ICT subject leaders, stakeholders from the school management such as head teachers and deputy head teachers from the United Kingdom and Malaysia, and officers from the Ministry of Education, Malaysia. Experts in education were identified through a purposeful sampling strategy. Patton defined a purposeful sampling strategy as follows:

The logic and power of purposeful sampling lie in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling. (Patton, 2002, p. 230)

Participants were chosen based on the rationale that their contributions would fulfil the purpose of the study; they would be knowledgeable about the themes related to this study and would thus be able to provide opinions or perspectives. These requirements are important for the development of the implementation strategy as well as to explore the perspectives regarding mobile learning implementation. There were three stages of respondent identification in this study: preliminary field tests in the United Kingdom, main field tests in Malaysia, and the dissemination and distribution stage in Malaysia.

To gain better, more international perspectives, it was decided to select participants in the preliminary tests from the United Kingdom instead of Malaysia. Respondents from the United Kingdom enriched the development of the implementation strategy because they are based in a country which is familiar with ICT integration in education. Two rather than three stages of the study were conducted in Malaysia. As with the respondents in the main field tests in Malaysia, respondents in the preliminary field tests in the United Kingdom were based in secondary schools.

For the preliminary field tests in the United Kingdom, participants were identified from four schools in Hampshire and Southampton. The participants are stakeholders from school management such as head teachers and deputy head teachers and the teaching staff, ICT subject leaders and English subject leaders. For the main field tests in Malaysia, participants were identified from nine schools in Terengganu, Malaysia. The participants are stakeholders from school management such as head teachers and deputy head teachers and teaching staff, ICT subject leaders and English subject leaders. Finally, for the dissemination and distribution stage in Malaysia, five officers were identified from a division of the Ministry of Education, Malaysia. These officers have been involved in the ICT integration in education and educational policy development.

### ***Step 3: Developing the product in preliminary form***

The implementation strategy was developed into two main parts. The first part is divided into two subsections. These are (i) Mobile lessons and (ii) Resourcing mobile learning. The section on mobile lessons includes suggestions related to the content and structure of the mobile lessons. The section on resourcing mobile learning includes suggestions regarding the facilities that will be needed for mobile learning implementation. Part 2 of the implementation strategy is divided into five subsections: (i) Ownership model; (ii) Acceptable Use Policy (AUP); (iii) Management and maintenance; (iv) Specific roles for supporting mobile learning; and (v) Support for major stakeholders. The section pertaining to the ownership model includes suggestions regarding the strategy for enabling the students to acquire mobile devices. The Acceptable Use Policy covers the policy that guides the students in using mobile technologies for learning. Management and maintenance includes the strategy for managing and maintaining the equipment.

The section on specific roles for supporting mobile learning at school suggests the specific roles that are important for the implementation. Finally, the section on support for major stakeholders discusses the approach to supporting the major stakeholders in the implementation. Although there are many versions of the implementation strategy, three versions were preserved: Version 1: Preliminary Field Tests; Version 2: Main Field Tests; and Version 3: Dissemination and Distribution Stage. These versions are included as Appendix A to Appendix C.

#### ***Step 4: Preliminary field tests/ formative evaluation***

The respondents in the preliminary field tests were English subject leaders, ICT subject leaders, and head teachers and deputy head teachers in secondary schools in the United Kingdom. Eighteen participants contributed from four schools in the field tests. The consent from the respondents to participate in the field tests was obtained before the field tests began. Participants were provided with documents explaining the nature of the research as well as the consent forms.

In preliminary field tests, the instrument applied is the interview. According to Gall *et al.* (2007), the interview consists of oral questions which are asked by the interviewer, and oral responses which are provided by the research participants. The purpose of the interview is to capture the respondents' perspectives (Patton, 2002). The nature of the interview in this study is to elicit perspectives from the respondents in the United Kingdom who are familiar with the ICT integration in teaching and learning. The interview was applied as a tool to obtain suggestions and to obtain additional or better ideas regarding the development of the implementation strategy. In addition, the interview also gathered the respondents' perspectives on implementing mobile learning. Lichtman (2006) divided the interview into four types: structured interview, guided interview, in-depth interview and casual or unplanned interviews. Each type of interview has its own advantages and disadvantages. In this study, the guided interview was applied. The guided interview was applied because it enabled the researcher to specify the themes that need to be covered before the interview. It enabled the researcher to be more organised and systematic in the data collection. However, the researcher had the flexibility to customise the interview schedule depending on the situation and leave room for additional question to be explored to help contextualise the findings.

Before the field tests, the interview schedule was peer-reviewed. In addition, the first school in the field tests was also considered as a sample for the pilot study. However, the data obtained from this school are used in this study. Teijlingen and Hundley (2001) stresses that, in qualitative research, it is possible for the researcher to use some or all of the pilot data as part of the main study. In addition, as no change is required for the interview schedule, it is appropriate to use the data obtained from this school. This concurs with the opinion of Connelly (2008):

Instruments and procedures may need adjustments based on the results of the pilot study. If major or many adjustments are made, then researchers may not be able to use the data in the parent study. If little change is required, the data may be used (Connelly, 2008, p. 411).

In the preliminary field tests, validity was emphasised. Validity refers to the degree to which a study accurately reflects or assesses the specific concept, which the researcher is attempting to measure (Colorado State University Official Website on Validity). Validity was ensured through sampling strategy. Participants were chosen based on the rationale that they would fulfil the purpose of the study; knowledgeable about the issues associated with the study, which would enable them to provide an opinion or perspectives that are relevant to the study. To ensure the credibility in the preliminary field tests, respondents in the United Kingdom are selected among the people who are experts in education; English subject leaders, ICT subject leaders, stakeholders from school management such as head teachers and deputy head teachers. Triangulation is another strategy to improve the validity of research (Golafshani, 2003). In the field tests, validity was ensured through the triangulation of data. Evidence from different individuals; English subject leaders, ICT subject leaders, head teachers and deputy head teachers were corroborated (Creswell, 2008). This ensures the accuracy and credibility of the study because the information draws on multiple sources of individuals (Creswell, 2008). Moreover, all data included in the analysis are double-checked to ensure that all opinions are reflected in the text.

Reliability was also emphasised in the preliminary field tests. Reliability refers to the extent to which an experiment, test, or any measuring procedure yields the same

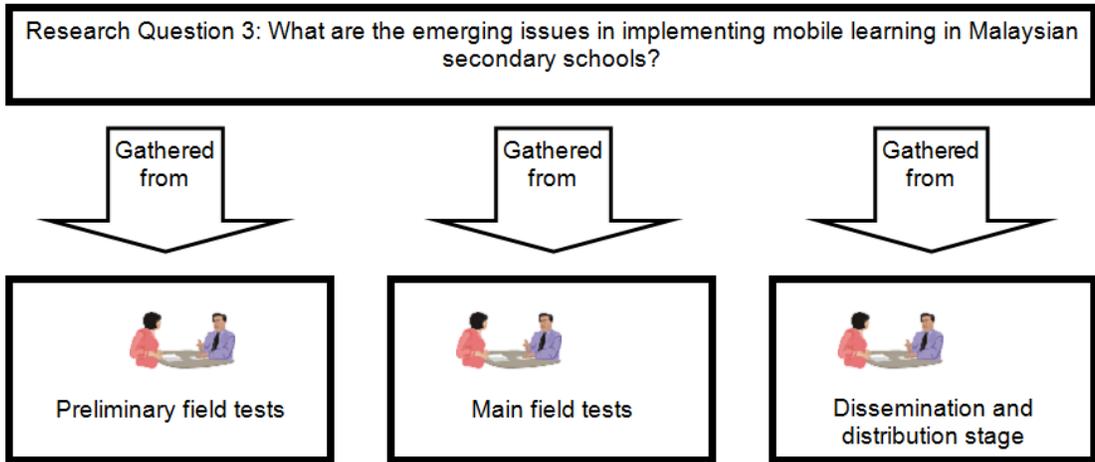
result on repeated trials (Colorado State University Official Website on Reliability). The study might have a limitation through researcher bias. The researcher is also the interviewer in the data collection which could cause problems. However, this was avoided by ensuring that the interview schedule is the basis of the field tests to ensure the reliability of the study.

In the preliminary field tests, the interview schedule is developed to explore “*Research Question 1: What is an effective implementation strategy in utilising mobile learning for the English Language vocabulary acquisition in Malaysian secondary schools?*” as well as the research sub-questions. The research question and sub-questions are developed to support the development of the implementation strategy. The following figure depicts the research question and sub-questions.

Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?		
 Pedagogy	 Stakeholder	 Technology
<p>1.1 What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?</p> <p>1.2 What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?</p> <p>1.3 What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?</p> <p>1.4 What is an effective implementation strategy in delivering mobile lessons to enable students master the mobile lessons?</p>	<p>1.5 What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills for the implementation?</p> <p>1.6 What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills for the implementation?</p> <p>1.7 What is an effective implementation strategy in ensuring that parents are well-informed about the implementation to foster their support?</p> <p>1.8 What is an effective implementation strategy in proposing important roles to support the implementation?</p> <p>1.9 What is an effective implementation strategy in addressing negative implications on students in using mobile phones in education?</p>	<p>1.10 What is an effective implementation strategy in obtaining funding for the implementation?</p> <p>1.11 What is an effective implementation strategy in enabling students acquiring mobile phones to be used in the implementation?</p> <p>1.12 What is an effective implementation strategy in managing and maintaining the devices in the implementation?</p>

Figure 16: Research question 1 and the sub-questions

In addition, emerging issues in implementing mobile learning in Malaysian schools are also explored. This is depicted in the following figure.



**Figure 17: Research question 3**

There were three interview schedules in the preliminary field tests. They were customised according to the respondents' posts in the schools. The interview schedule for the school management; head teachers and deputy head teachers was designed to elicit suggestions and opinions associated with stakeholders and the technology management. These are: strategy to obtain funding for the implementation; strategy to enable students to acquire mobile phones for the implementation; strategy to prepare teachers, students and parents regarding the implementation; strategy to assign specific roles to support the implementation; and strategy to address the issue of negative implications of the use of mobile phones for students. Emerging issues in implementing mobile learning in schools were also explored. The interview schedule for head teachers and deputy head teachers is included as Appendix D.

The interview schedule for ICT subject leaders was designed to elicit suggestions and opinions associated with stakeholders and the technology management. These are: strategy to manage and maintain facilities in the implementation; and strategy to assign specific roles to support the implementation. Emerging issues in implementing mobile learning in schools were also explored. The interview schedule for ICT subject leaders is included as Appendix E.

The interview schedule for English subject leaders was designed to elicit suggestions and opinions associated with pedagogy. These are: strategy to

propose pedagogically sound mobile lessons for English vocabulary acquisition; strategy to integrate mobile lessons into the existing curriculum; strategy to deliver mobile lessons to fit with students' daily activities; and strategy to deliver mobile lessons to enable students to master the lessons effectively. Emerging issues in implementing mobile learning in schools were also explored. The interview schedule for English subject leaders is included as Appendix F.

### ***Step 5: Main product revision***

The data input in the preliminary field tests are the interviews. The interviews were transcribed using HyperTRANSCRIBE. HyperTRANSCRIBE is a tool for transcribing audio and video files (HyperTRANSCRIBE Official Website). The interview data is subsequently analysed using NVivo, software which aids the process of analysing data (NVivo Official Website). In NVivo, important terms are Documents, Nodes (Free Nodes and Tree Nodes) and Attributes. Transcribed interviews are known as Documents, which can be imported into NVivo (Richards, 1999). There are 18 documents, which consist of 18 interview transcriptions from the preliminary field tests. The documents are coded as Nodes, with two types of Nodes as a preference: Free Nodes, which code without organisation, and Tree Nodes, to organise code hierarchically (Richards, 1999). In this study, Free Nodes are not used. Data gathered from the preliminary field tests were organised in Tree Nodes. Another important term in NVivo is Attributes, where the documents are assigned values (Richards, 1999). For example, the interview transcription of the English subject leader, with the pseudonym JP from RY School, was given the Attribute JPRY. The first group of raw data derived from the interview in the preliminary field tests is related to *“Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?”* as well as the sub-questions. The research question and sub-questions are depicted in Figure 16: Research question 1 and the sub-questions.

Data analysis was conducted according to the existing framework; Research question 1 and the sub-questions. This is deductive analysis. The framework was reviewed and categories were identified. The data analysis continued with the examination of the text data; by reading it carefully and fully. The statements or

phrases are labelled or incorporated with the appropriate category based on the framework.

For example, for phrases related to the research sub-question 2.1: “*What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?*”, the phrases are categorised and grouped under a tree node which is named as “*curriculum integration*” in Nvivo. The phrases are then organised under specific sub-tree nodes in Nvivo. These sub-tree nodes represent the respondents’ perspectives on the approach to integrate mobile lessons into the existing curriculum; “*as a preparation*”, “*as an enrichment*” and “*additional suggestion*”.

The sub-tree node “*as a preparation*” contains the opinion of the respondents who suggest that mobile lessons are suitable for preparation; as depicted in Transcription 1. The sub-tree node “*as an enrichment*” contains the opinion of the respondents who suggest that mobile lessons are suitable for enrichment; as depicted in Transcription 2. The sub-tree node “*additional suggestion*” contains the opinion of the respondents who suggest additional approaches in integrating mobile lessons into the existing curriculum; as depicted in Transcription 3. The examples of the transcriptions and the tree nodes are shown below:

**Transcription 1: As a preparation**

To prepare student for activities related to speech and writing. One of the words would maybe be argue, or represent or respond. It might be a discourse of speech, in addition. Furthermore you might use that. It would be something different to writing to or by Shakespeare. They can analyze or comment on the language. That would probably be how for us. Not every school is structured that way

**Figure 18: Transcription 1**

### Transcription 2: As an enrichment

When you are learning a second language, the things like introducing vocabulary, pronunciation, is really good, is really good, because obviously the student certainly almost have got personal attention, doesn't they? They will be able to practice and do things like that and, individually, whereas through activity like that, they don't get the opportunity to do things like that in the classroom, the other things of course is that they would presumably be able to do at any time.

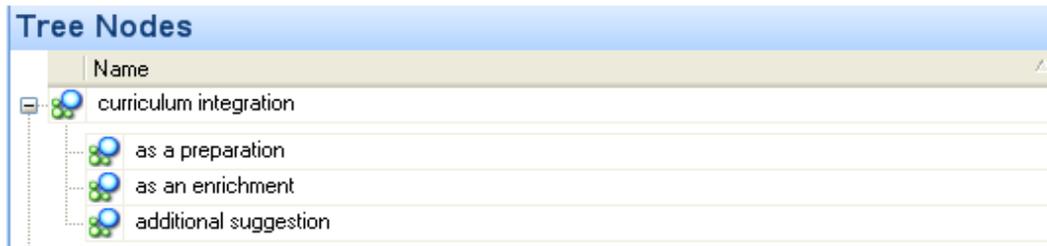
**Figure 19: Transcription 2**

### Transcription 3: Additional suggestion

I think, well, I mean when you think with the things like with your quiz questions, okay, for instance, you could set, you could do things like, set a research project on Shakespeare, or Shakespeare's play, okay, and for instance, a series of questions about the thing it won't allow the students to do, I suppose. It's offering a kind of like short notes or short answer, isn't it? You are not going to be able to print it, or in terms of the kind of writing for instance you not going to ask them to do any writing at any length whatever. From this point of view, I think for me, an English, English teaching is a skill basically, is it not content. I could choose to teach a class, I could teach them through any book; it wouldn't have to be Shakespeare, because what I'm teaching is the skills. If I am teaching about the Shakespeare play, it wouldn't matter which play it was. What would matter it is the skill that I am giving them, and I think when you got like quiz questions or whatever, then it lends itself more to question which are content-wise.

Perhaps it could be adapted with grammar, in the UK, it would be better, in terms of grammar, for example, how to use semicolons. Because in the UK it is not being taught from a small age, they pick it up as they go on.

**Figure 20: Transcription 3**



**Figure 21: Tree nodes and the sub-tree nodes derived from the interviews**

The rationales for the respondents' opinions are studied. The revision of the implementation strategy continues with the process of selecting appropriate opinions. Some of the justifications were supported by the literature and some of the justifications were based purely on the practicality of the suggestions. The selected opinions are included in the revised implementation strategy, which is known as "Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)" as Appendix B.

Another group of raw data derived from the interview in the preliminary field tests relates to emerging issues in implementing mobile learning. The raw data obtained in preliminary field tests was combined with other data from the main field tests and the final stage of the data collection; dissemination and distribution. This group of data was analysed to answer the research question which was depicted in Figure 17: Research question 3. The data analysis was conducted based on the model by Cresswell (2008), in discovering patterns, themes or categories through careful examination of data. This is inductive analysis.

Text data were examined by reading it carefully and fully. The data analysis followed by identifying categories from the text data. The statements or phrases are grouped under a tree node which is named as "*emerging themes*" in Nvivo. Under this tree node, there are sub-tree nodes or also known as categories. For each category, all the statements or phrases that go to those categories were identified. The statements or phrases are then labelled and organised under specific sub-tree nodes in Nvivo which represent the categories. These sub-tree nodes represent the respondents' perspectives on the emerging issues in implementing mobile learning; for example "*cost issue*", "*health issue*", "*losing and damaging*" and "*misuse*".

The sub-tree node “*cost issue*” contains the opinion of the respondents who believed that there are cost issues in implementing mobile learning as depicted in Transcription 4. The sub-tree node “*health issue*” contains the opinion of the respondents who believed that there are issues associated with health in implementing mobile learning as depicted in Transcription 5. The sub-tree node “*losing and damaging issue*” contains the opinion of the respondents who believed that there are issues associated with students losing and damaging the devices in implementing mobile learning as depicted in Transcription 6. The sub-tree node “*misuse*” contains the opinion of the respondents who believed that there are issues with misuse in implementing mobile learning as depicted in Transcription 7. The examples of the transcriptions and the sub-tree nodes (categories) associated with the emerging issues is shown below:

Transcription 4: Cost issues

Also, as we are going towards learning and working out how we do stuff well, if you have put the wires to the Internet, why do you use extra power consumption on wireless technologies? Let’s say the battery is drained off, the students would just plug the charger into the electrical plug in school and charge the battery. The cost of the electricity would be a burden to the school. We must look at all angles and issues.

But I am not sure how you will freely provide, for example laptop for a year group, like 260 students. A lot of money, at the time when school gets everything squeezed.

**Figure 22: Transcription 4**

Transcription 5: Health issues

There are also certain medical issues, when you use a mobile device for texting, it can cause hazard to your health. There may come a time when we shouldn’t be doing this as much as we do now.

**Figure 23: Transcription 5**

### Transcription 6: Losing and damaging issue

That's one of the issues, isn't it? To have them to manage it is just a nightmare. It is difficult to prevent students from losing and damaging the devices.

Figure 24: Transcription 6

### Transcription 7: Misuse

The other problem is if you are using the Bluetooth. How can you stop other thing from being put on the phones? There have been a problem where teachers have left the Bluetooth on their phones, and they had inappropriate images being bluetoothed on to their phones, and that can happen to pupils. I don't know how this will affect pupils in Malaysia, but over here it is a problem. There are certain images that I would rather not see and I wouldn't want children to see it too. It would upset the child. How do you avoid that? It would depend on whether you need Bluetooth when you take the phone.

Yes. One of the problems we have is that the children taking images that we rather they did not take. Last year we had a boy who broke his arm and was trying hard not to cry and show he's in pain, and we had a couple of girls trying to take the images of him in pain. This is what we don't want to see.

Figure 25: Transcription 7



Figure 26: Tree nodes and sub tree nodes: emerging themes

Following the coding process in Nvivo, the data analysis continued by determining the relationships across categories. This process is conducted in Inspiration 8. Inspiration 8 is a tool which supports visual thinking techniques and the process of developing and organising ideas (Inspiration 8 Official Website). Sub-tree nodes (categories) are represented in Inspiration 8 by names similar to those used in

NVivo. For example, the sub-tree node (categories) known as “cost issue” in NVivo is also named “cost issue” in Inspiration 8. The following figure is an excerpt from the process of data analysis using Inspiration 8.

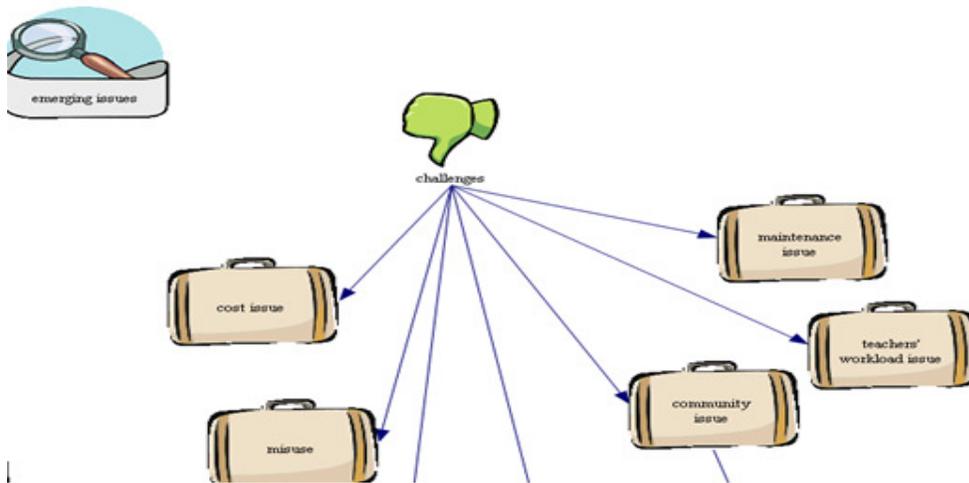


Figure 27: Excerpt from the data analysis with Inspiration 8

In Inspiration 8, the redundancy in the categories is reduced. All sub-tree nodes (categories) are arranged and re-arranged until a pattern of relationship emerges. A model based on the relationship is created. The model established that there are two groups of relationships. These are “opportunities to implement mobile learning in Malaysian schools” and “challenges to implement mobile learning in Malaysian schools”. Findings related to this model are discussed in Emerging themes in the implementation of mobile learning. In addition, findings from the preliminary field tests that relate to the evaluation of the implementation strategy are included in Evaluation of the implementation strategy: preliminary field tests.

### **Step 6: Main field tests/ summative evaluation**

Nine schools contributed to the main field tests in Malaysia, providing 27 participants. They were English subject leaders, ICT subject leaders and stakeholders from the management staff - head teachers and deputy head teachers. The consent of the respondents to participate in the field tests was obtained before the field tests began. As in the preliminary field tests, participants were provided with documents explaining the nature of the research as well as consent forms.

In the main field tests, the instrument of data collection is the interview. Questions are devised to elicit opinions on the practicality of the implementation strategy, which has been revised from the findings of the preliminary field tests. The nature of the interview in Malaysia is also intended to obtain perspectives from educational experts in schools about the issue of implementing mobile learning in Malaysia. However, this differs from the approach applied in the preliminary field tests where the interviews in the United Kingdom were conducted to obtain suggestions and additional or better ideas regarding the development of the implementation strategy. Compared to schools in the United Kingdom, schools in Malaysia are not as advanced in using ICT in education. Therefore, it is appropriate to apply opinion-based questions to the respondents in Malaysia rather than suggestion-based questions as were applied to the respondents in the United Kingdom.

As in the preliminary field tests, the guided interview was chosen. The guided interview enabled the researcher to specify in advance the themes that needed to be covered and to be more organised and systematic in the data collection. At the same time the researcher had the flexibility to customise the interview schedule depending on the situation. Before the field tests, the interview schedule was peer-reviewed. The first school in the field tests was also considered as a sample for the pilot study. However, the data obtained from this school are used in this study. Teijlingen and Hundley (2001) stress that, in qualitative research, it is possible for the researcher to use some or all of the pilot data as part of the main study. In addition, as no changes are required for the interview schedule, it is appropriate to use the data obtained from this school in this study. This concurs with the opinion of Connelly:

Instruments and procedures may need adjustments based on the results of the pilot study. If major or many adjustments are made, then researchers may not be able to use the data in the parent study. If little change is required, the data may be used (Connelly, 2008, p. 411).

As in the preliminary field tests, validity was ensured through sampling strategy. To ensure the credibility in the main field tests, respondents in Malaysia are selected among the people who are experts in education; English subject leaders, ICT

subject leaders, stakeholders from school management such as head teachers and deputy head teachers. Similar to the preliminary field tests, triangulation is another strategy to improve the validity of the main field tests. Moreover, all data included in the analysis are double-checked to ensure that all opinions are reflected in the text. Reliability was also emphasised in the main field tests by ensuring that the interview schedule is the basis of the field tests.

In the main field tests, the interview schedule is developed to explore *“Research Question 1: What is an effective implementation strategy in utilising mobile learning for the English Language vocabulary acquisition in Malaysian secondary schools?”*, as well as the research sub-questions. The research question and the sub-questions are related to the development of the implementation strategy. The research question and the sub-questions were represented in Figure 16: Research question 1 and the sub-questions. In addition, emerging issues of implementing mobile learning in Malaysian schools are explored. This is highlighted in the research question which was represented in Figure 17: Research question 3.

In the main field tests, three interview schedules were customised according to the respondents' posts in schools. The interview schedule for the school management, head teachers and deputy head teachers, was devised to elicit suggestions and opinions associated with stakeholders and the technology management. These are: strategy to obtain funding for the implementation; strategy to enable students to acquire mobile phones for the implementation; strategy to prepare teachers, students and parents regarding the implementation; and strategy to address the issue of the negative implications of the use of mobile phones for students. Emerging themes related to mobile learning implementation in schools are also explored. The interview schedule for head teachers and deputy head teachers is included as Appendix G. The interview schedule for ICT subject leaders was designed to elicit suggestions and opinions associated with stakeholders and the technology management. These are: strategy to manage and maintain facilities in the implementation; and strategy to assign specific roles to support the implementation. Emerging themes related to mobile learning implementation in schools are also explored. The interview schedule for ICT subject leaders is included as Appendix H. The interview schedule for English subject leaders was

intended to elicit suggestions and opinions associated with pedagogy. These are: strategy to propose pedagogically sound mobile lessons for English vocabulary acquisition; strategy to integrate mobile lessons into existing curriculum; and strategy to deliver mobile lessons to fit in with the students' daily activities. Strategy to deliver mobile lessons to enable students to master the lessons and strategy to assign specific roles to support the implementation are also explored. Emerging themes related to mobile learning implementation in schools are also explored. The interview schedule for English subject leaders is included as Appendix I.

### ***Step 7: Final product revision***

The input data in the main field tests are from interviews. The interviews were transcribed using HyperTRANSCRIBE (HyperTRANSCRIBE Official Website). Interview data are analysed using NVivo, software which aids the process of analysing data (NVivo Official Website). There were 27 Documents consisting of 27 interview transcripts from the main field tests organised into Tree Nodes.

The first group of raw data derived from the interview in the main field tests is data related to "*Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?*", and the sub-questions. The research question and the sub-questions were represented in Figure 16: Research question 1 and the sub-questions. The data analysis was conducted based on the deductive model.

Another group of raw data derived from the interview in the main field tests is related to the emerging themes in the implementation of mobile learning. The raw data in main field tests were combined with other data from the preliminary field tests and the final stage of the data collection; dissemination and distribution for analysis. This group of data was analysed to answer the research question depicted in Figure 17: Research question 3. The data analysis was conducted based on inductive analysis by Cresswell (2008).

Findings related to the emerging themes in the implementation of mobile learning are discussed in Emerging themes in the implementation of mobile learning. In addition, findings from the main field tests relating to the evaluation of the

implementation strategy are included in Evaluation of the implementation strategy: main field tests.

### ***Step 8: Dissemination and distribution***

The dissemination and distribution is the final step applied from the Educational Research and Development (ER&D) approach. In this stage, the implementation strategy to utilise mobile learning at Malaysian schools was disseminated to the officers in the Ministry of Education, Malaysia. It was documented in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Dissemination and Distribution Stage)” as Appendix C. As well as disseminating the implementation strategy, this final stage also explores the potential of mobile learning to complement existing practices in Malaysian schools. Emerging themes regarding mobile learning implementation in Malaysia are also established.

In disseminating and distributing the implementation strategy, the officers are assured that the proposed technology would be an additional viable alternative, not a replacement for the existing technology (Waldrop and Adams, 1988). Officers were also able to see the benefits of the technology introduction and to understand the feasibility of implementing mobile learning in Malaysian schools (JISCinfoNet and Pennington, 2003).

In addition, the Social Interaction model is applied (Havelock, 1973). The Social Interaction model facilitates the dissemination and distribution process through a “social system”. In this case, the officers of the Ministry of Education, Malaysia, are assumed to be a “social system”. A dissemination strategy associated with the Social Interaction (S-I) Model known as “Opinion leadership utilisation” is also applied. “Opinion leadership utilisation” is a dissemination strategy where the officers are identified as an initial channel for disseminating the implementation strategy to the Ministry of Education, Malaysia.

Five officers from a division across various sectors in the Ministry of Education, Malaysia, were identified by a senior government employee in the division. These officers are recommended because of their participation in ICT projects and in

educational policy making and well experienced in the school based ICT. All respondents have familiarity with the Malaysian Smart Schools' project and general technology in schools. They are active in the international field of school based technology including visiting the United Kingdom regularly. They have a research background up to doctoral level.

As in the main field tests, guided interviews were applied. Guided interviews enabled the researcher to specify in advance the themes that needed to be covered, and to be more organised and systematic in the data collection. At the same time, the researcher had the flexibility to customise the interview schedule according to the situation. Consent from the respondents was obtained before the field tests began. All participants were provided with documents explaining the nature of the research as well as consent forms.

Before the dissemination and distribution, the interview schedule was peer-reviewed. A pilot study was also conducted with a teaching staff member from the School of Education, University of Southampton. A mock interview session was conducted with the teaching staff member who played the role of an officer from the Ministry of Education.

As in the preliminary field tests, validity was ensured through sampling strategy. To ensure the credibility in the dissemination and distribution, respondents are selected among the experts in education; officers in the Ministry of Education who participate in ICT projects and in educational policy making and well experienced in the school based ICT. Reliability was also emphasised by ensuring that the interview schedule is the basis of the field tests. Moreover, all data included in the analysis are double-checked to ensure that all opinions are reflected in the text.

In the dissemination and distribution, the nature of the interview is also to bring in perspectives from the officers in the Ministry of Education, Malaysia, regarding the potential of mobile learning to complement existing practices in Malaysian schools. The interview also explored the emerging themes regarding mobile learning implementation in Malaysian secondary schools. The interview schedule was developed to explore four concepts related to the potential of mobile learning to

complement existing practices in Malaysian schools. The concepts include the following: mobile learning as English Language subject support; mobile learning as a medium to complement Malaysian schools' ICT policy; mobile learning as a medium to complement the Malaysian Smart School vision to employ mobile technologies; and mobile learning as an alternative teaching and learning tool. Additional question about the implementation strategy and emerging issues in the implementation of mobile learning were also explored. The interview schedule is included as Appendix J.

The input data in the dissemination and distribution are from the interviews. The interviews were transcribed using HyperTRANSCRIBE (HyperTRANSCRIBE Official Website). Interview data are analysed using NVivo, software which aids the process of analysing data (NVivo Official Website). There were 5 Documents consisting of 5 interview transcripts, organised into Tree Nodes.

The first group of raw data derived from the dissemination and distribution stage is data relating to “*Research Question 2: How can mobile learning complement the existing practices in Malaysian secondary schools?*”, and the sub-questions as depicted in Figure 28. The data analysis was conducted based on the deductive model.

Research Question 2: How can mobile learning complement the existing practices in Malaysian secondary schools?			
 English Language subject support	 Malaysian school's ICT policy	 Malaysian Smart School's vision	 Alternative teaching and learning
2.1 How can mobile learning add value to the existing initiatives in Malaysian schools in improving students command in English Language subject?	2.2 How can mobile learning complement the policy in Malaysian Educational System to deploy ICT?	2.3 How can mobile learning complement the Malaysian Smart School's vision to deploy mobile technologies?	2.4 How can mobile learning become an alternative teaching and learning tool?

Figure 28: Research question 2 and the sub-questions

Another group of raw data derived from the interview in the dissemination and distribution is related to the emerging themes in the implementation of mobile learning. The raw data at this stage were combined with other data from the preliminary field tests and the main field tests. This group of data was analysed to answer the research question depicted in Figure 17: Research question 3. The data analysis was conducted based on inductive analysis by Cresswell (2008).

Findings related to the emerging themes in the implementation of mobile learning are discussed in Emerging themes in the implementation of mobile learning. In addition, findings from the dissemination and distribution are discussed in Dissemination and distribution of the implementation strategy.

This section has discussed the steps applied based on the Educational Research and Development (ER&D) approach. The steps are as follows: Step 1: Research and information-gathering; Step 2: Planning; Step 3: Developing the product in preliminary form; Step 4: Preliminary field testing/ formative evaluation; Step 5: Main product revision; Step 6: Main field-testing/summative evaluation; Step 7: Final product revision; and Step 8: Dissemination and distribution. The next section provides the summary of this chapter.

### **Summary**

This chapter has discussed the research methodology underpinning the study. The research methodology is known as the Educational Research and Development (ER&D) approach. It has been established that the Educational Research and Development (ER&D) approach is derived from educational evaluation. In understanding the position of educational evaluation in educational research, educational evaluation and educational research are compared. The literature review established that educational evaluation and educational research are mostly intertwined.

Although the Educational Research and Development (ER&D) approach provides an effective model for educational product development, possible challenges involve finance, manpower and time. However, the literature review established that some research projects based on this approach have been conducted by graduate

students. These research projects omitted some of the steps from the Educational Research and Development (ER&D) approach.

This chapter also includes the justification for choosing the methodology. Another viable approach which is similar to Educational Research and Development (ER&D) approach with regard to the guided processes involved and the overall purpose is examined for comparison purposes. This approach is known as the action research method. However, Educational Research and Development (ER&D) approach is adopted because it offers a specific model which supports an educational product development, whereas in action research this model does not exist.

A section discussing the steps in the Educational Research and Development (ER&D) approach is also included. Two models associated with the Educational Research and Development (ER&D) approaches are compared. These are the ten-stage model proposed by Borg and Gall (1979) and the ten-stage model proposed by Dick and Carey (1978). Both models consist of similar stages for product development. Both models are customised by omitting some of the steps of the Educational Research and Development (ER&D) approach.

Finally, a section discussing the steps in applying the Educational Research and Development (ER&D) approach is included. The steps are research and information-gathering, planning, developing the product in preliminary form, preliminary field-testing or formative evaluation, main product revision, main field-testing or summative evaluation, final product revision, and dissemination and distribution.

In conclusion, the Educational Research and Development (ER&D) approach supported the development of the implementation strategy through systematic steps. The potential of mobile learning for complementing existing practices in Malaysian schools is also established. Besides this, emerging themes related to mobile learning implementation in Malaysian secondary schools are also explored. The next chapter continues with a discussion of the findings established in the study.



## **Chapter 4: Research findings**

After describing the research methodology which underpinned the study, this chapter represents the analysis results of the respondents' views on the development of the implementation strategy and the emerging issues in implementing mobile learning. This chapter consists of four sections; Evaluation of the implementation strategy: preliminary field tests, Evaluation of the implementation strategy: main field tests, Dissemination and distribution of the implementation strategy and Emerging themes in the implementation of mobile learning. It begins by discussing the finding from the preliminary field tests and main field tests which relates to the evaluation of the implementation strategy proposed in the study. Then it goes on to discuss the finding from the final stage of the study; disseminating and distributing the implementation strategy to the officers in the Ministry of Education, Malaysia. It also discusses the emerging issues in implementing mobile learning which is raised by all respondents in each field test. In this chapter, every statement which is related to each topic made by a respondent is represented. Some statements have been paraphrased and combined for clarity and brevity. In addressing the respondent's statements, abbreviations are used; the English subject leader is addressed as English, the ICT subject leader is addressed as ICT, the Head teacher or Deputy head teacher is addressed as Head and the Officer in the Ministry of Education is addressed as Officer.

### **Evaluation of the implementation strategy: preliminary field tests**

Preliminary field tests were conducted in four schools in the United Kingdom. The respondents are English subject leaders, ICT subject leaders as well as head teachers and deputy head teachers in secondary schools in Hampshire and Southampton. The main objective of the preliminary field tests is to evaluate the implementation strategy in implementing mobile learning, which was highlighted in a handbook named "Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)" as Appendix A. Interview schedules were developed according to the following research question:

## How to implement mobile learning for English Language learning in Malaysian secondary schools?

Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?		
 Pedagogy	 Stakeholder	 Technology
<p>1.1 What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?</p> <p>1.2 What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?</p> <p>1.3 What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?</p> <p>1.4 What is an effective implementation strategy in delivering mobile lessons to enable students master the mobile lessons?</p>	<p>1.5 What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills for the implementation?</p> <p>1.6 What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills for the implementation?</p> <p>1.7 What is an effective implementation strategy in ensuring that parents are well-informed about the implementation to foster their support?</p> <p>1.8 What is an effective implementation strategy in proposing important roles to support the implementation?</p> <p>1.9 What is an effective implementation strategy in addressing negative implications on students in using mobile phones in education?</p>	<p>1.10 What is an effective implementation strategy in obtaining funding for the implementation?</p> <p>1.11 What is an effective implementation strategy in enabling students acquiring mobile phones to be used in the implementation?</p> <p>1.12 What is an effective implementation strategy in managing and maintaining the devices in the implementation?</p>

Figure 29: Research question 1 and the sub-questions

To answer the research question, three concepts are explored which are pedagogy, stakeholder and technology. These concepts become the basis of the research sub-questions. The research questions and the sub-questions explored in the preliminary field tests to support the development of the implementation strategy are depicted in the above figure. The following sub-sections explored the findings from the preliminary field tests.

## Evaluation in preliminary field tests: concept 1 (pedagogy)

This section addresses the research question associated with pedagogy which was highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The research sub-questions are developed to evaluate the suggestions, which are included in the implementation strategy. There are four research sub-questions related to this concept:

1.1) What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?

1.2) What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?

1.3) What is an effective implementation strategy in delivering mobile lessons so that it could fit in with the students daily activities?

1.4) What is an effective implementation strategy in delivering mobile lessons to enable students to master the lessons?

### **1.1) What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?**

The respondents were asked regarding the pedagogical soundness of the mobile lessons for vocabulary learning established in the study. The structure of the mobile lessons as established in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A was highlighted to the respondents. Three respondents agree that the structure of the mobile lessons is pedagogically sound for English vocabulary acquisition (*English 4b, English 3 and English 1*). However, two respondents discover some areas for improvement. A respondent suggests including a voice mechanism to enhance the mobile lessons (*English 4a*). Another respondent reveals some flaws in the examples included in the mobile lessons (*English 2*).

### **1.2) What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?**

Two respondents agree with the idea of integrating the mobile lessons into the curriculum (*English 3, English 1*). A respondent suggests integrating mobile lessons into speech writing and debating (*English 3*). The respondent provides an example on how to integrate the mobile lessons into the scheme of work in the English Language subject at the school (*English 3*). Another respondent suggests enhancing the mobile lessons with quizzes to support the scheme of work at the school (*English 1*).

However, three respondents do not provide any suggestions on how to integrate the mobile lessons into the curriculum because they are not familiar with the idea to deploy the mobile lessons to support English learning (*English 4b, English 4a and English 2*). A respondent hesitates to integrate mobile lessons into the existing curriculum because it is difficult to anticipate the students' attitude about mobile learning, which is considered as a new approach to the students (*English 4b*). Another respondent has an ambiguity to use mobile lessons for native speakers because the respondent believes that it is not relevant to teach vocabulary per se for native speakers (*English 4a*). However, the respondent was optimistic that the mobile lessons are suitable to be used to learn a foreign language or English as a second language (*English 4a*). Finally, a respondent preferred to use e-learning rather than mobile learning because to implement mobile learning in schools is time consuming and might not bring significant advantages compared to e-learning (*English 2*).

### **1.3) What is an effective implementation strategy in delivering mobile lessons so that it could fit with students' daily activities?**

Two respondents suggest delivering the mobile lessons in the afternoon after students finishing their school's session (*English 2 and English 3*). However, a respondent has no suggestion about the appropriate time to deliver the mobile lessons but argues whether students are willing to follow a schedule (*English 4a*). The respondent believes that students in the United Kingdom might not be interested to utilise the mobile lessons if they have to follow the schedule, but was unsure about the situation in Malaysian schools (*English 4a*).

#### **1.4) What is an effective implementation strategy in delivering mobile lessons to enable students master the lessons?**

A respondent agrees with the suggestion as highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A and believes that it is appropriate to deliver mobile lessons gradually so that students could cope with the lessons. The respondent comments:

*“I think so, it is small, and they should be able to pick that up. It is always said it is good to have it little and often. So, I think, I agree, I think that is fine.”* (English 4b).

Another respondent has an ambiguity in the beginning, but in the end was positive about the suggestion (*English 1*). Another respondent stresses that the ability to master the lessons would depend on the type of the words; it would be easier to understand simple words than complex words but finally suggests introducing six words a week (*English 3*). Another respondent suggests emphasising on repetition (*English 4b*). The respondent suggests delivering six words, 3 times a week to ensure repetition (*English 4b*). In addition, the respondent also suggests including a test in the mobile lessons at the end of the week to check students’ understanding (*English 4b*).

## Evaluation in preliminary field tests: concept 2 (stakeholder)

This section addresses the research question pertaining to stakeholders which was highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The research sub-questions are developed to evaluate the suggestions, which are included in the implementation strategy. There are five sub-questions associated with this concept:

- 1.5) What is an effective implementation strategy in preparing teachers with the proper attitude, knowledge and skills?
- 1.6) What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills?
- 1.7) What is an effective implementation strategy in ensuring parents are aware and well informed regarding the implementation?
- 1.8) What is an effective implementation strategy in proposing important roles to support the important?
- 1.9) What is an effective implementation strategy in addressing negative implications for students in using mobile phones for learning?

### **1.5) What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills?**

To prepare teachers in the implementation of mobile learning, most respondents stress the importance of training. A respondent believes that training is essential to prepare teachers with a positive attitude which would eventually disseminate the positive message to students about the implementation (*Head 1b*). Another respondent suggests that the training sessions should emphasise on skills and knowledge, which would be useful for the implementation (*Head 2*). Two respondents provide examples of the existing teachers’ training at their schools (*Head 1a and Head 3b*)

Another approach, which was suggested by the respondents to prepare teachers in the implementation of mobile learning, is to encourage teachers to contribute in piloting the implementation (*Head 1b and Head 3b*). Two respondents believe that

this is useful to encourage a sense of ownership among teachers; which would eventually raise positive attitude (*Head 1b and Head 3b*)

Another suggestion raised by a respondent is to implement mobile learning gradually by selecting several classes at the beginning rather than to introduce it to whole schools (*Head 3b*). According to the respondent, this might help the teachers to be prepared for the implementation (*Head 3b*). Listening to the students' voice is another approach to encourage positive attitudes among teachers (*Head 3a*). The respondent believes that students should be given the opportunity to explain to teachers about their interest to utilise emerging technology such as mobile phones (*Head 3a*). According to the respondent, this would raise positive attitude among teachers (*Head 3a*).

#### **1.6) What is an effective implementation strategy in preparing students with the proper attitude, knowledge and skills for the implementation?**

When asked, the most popular answer raised by the respondents is to conduct induction sessions to prepare students for the implementation (*Head 2, Head 3b, Head 1b, Head 3a, Head 1a*). However, three respondents believe that the induction sessions should emphasise on the benefit and the rationality of the implementation rather than the practical knowledge because the students as digital natives are familiar with technology (*Head 3b, Head 2 and Head 1b*). Through the induction sessions, teachers-students communication is essential to educate the students about the objective and the projected outcomes of the implementation (*Head 3a*). Finally, a respondent suggests that students should be encouraged to contribute in the pilot study to foster support from them (*Head 1b*).

#### **1.7) What is an effective implementation strategy in ensuring that parents are well informed about the implementation?**

The respondents suggest several approaches in communicating with parents. These are through parents' evening (*Head 2, Head 3b, Head 1a*), documents (*Head 1a*) and school websites (*Head 1a*). A respondent suggests multiple approaches to communicate with parents such as through documents, e-mail, school websites and parent's evening (*Head 3b*).

Four respondents also suggest convincing the parents about the benefits of the implementation (*Head 3a, Head 1b, Head 2 and Head 3b*). In addition, a respondent also suggests reassuring parents regarding the minimal expenses that would be needed for the implementation (*Head 2*).

**1.8) What is an effective implementation strategy in proposing important roles to support the implementation?**

One of the roles, which are important to support the implementation, is technical support staff. The findings established that five respondents agree with the importance of providing technical support staff (*ICT 3c, ICT 4a, ICT 4b, ICT 1a and ICT 3a*).

When asked regarding the provision of the technical support, the answers vary. Three respondents are unsure whether to provide additional technical support specifically for mobile learning or to use existing technical support at schools (*ICT 3c, ICT 3a and ICT 4a*). A respondent believes that most problems related to mobile phones are self-regulating and students might be capable to deal with the problems (*ICT 3b*). Two respondents suggest getting support from the mobile phone company in managing and maintaining the devices (*ICT 3b and ICT 1b*). However, a respondent stresses that it might be a challenge to achieve timely response when getting support from the mobile phone company (*ICT 1b*). Three respondents believe that it is also possible to provide additional technical support at school depending on demand and size of the school (*ICT 3a, ICT 4a and ICT 3c*).

A respondent relates to the existing practices at the school (*ICT 4a*). The respondent suggests providing generic support; technical supports who are responsible to manage and maintain all types of devices, so that there will be more technical support available for any devices at any given time (*ICT 4a*). Three respondents believe that getting support from the existing technical support staff could be the solution (*ICT 3b, ICT 3c and ICT 3a*). However, other three respondents stress that training should be provided to prepare the technical support staff for the implementation (*ICT 2, ICT 1b and ICT 3c*). Another respondent stresses that in addition to training, additional clause should be included in their contract to clarify their additional role (*ICT 3a*).

Another suggestion for the provision of technical support staff is to provide centralised help desk (*ICT 2*). This would reduce costs during the early stage of the implementation. The respondent also proposes several schools to share a centralised help desk (*ICT 2*). With regard to the role of the technical support staff, the suggestions are to conduct periodic checks and to perform early diagnosis (*ICT 3c*).

The respondents were asked about their perspectives in encouraging the students to contribute as maintenance assistance to support the implementation. Six respondents agree that students' involvement would help towards the management and maintenance of the facilities (*ICT 4a, ICT 3a, ICT 1a, ICT 3c, ICT 1b and ICT 3b*). Three respondents point out that students have been contributing in managing and maintaining facilities at their schools (*ICT 4a, ICT 3a and ICT 1a*).

There are several reasons raised by the respondents in supporting the suggestion. Two respondents believe that encouraging students to contribute to the implementation would encourage a sense of ownership; which would eventually raise positive attitude about the implementation (*ICT 2 and ICT 3c*). Another respondent believes that involving students as maintenance assistance would enhance students' knowledge in ICT (*ICT 1b*). A respondent believes that encouraging students to contribute to the implementation would be worthwhile because they might offer a unique way in helping their friends compare to adults (*ICT 3a*). Two respondents believe that, student as a digital native is suitable to perform the task (*ICT 1a and ICT 3b*). A respondent suggests that being involved as a maintenance assistant is an advantage for the students when applying for further study (*ICT 3c*). However, another respondent stresses that scheduling is important to fit in with the students' dairy schedule (*ICT 1a*).

To support the implementation, another important roles established in the study are English subject leaders and ICT coordinators. When asked, respondents provide various opinions. A respondent believes that both people are important and they need to understand each other's responsibilities (*Head 3a*). The respondent also suggests that the English subject leaders should be informed about their responsibilities to monitor student progress and to ensure the success of the implementation (*Head 3a*). In addition, the respondent also suggests that the ICT

coordinator should ensure that students are prepared with the skills for the implementation (*Head 3a*). For another respondent, people who are suitable to support the implementation are volunteers from any department and should not be limited to English subject leaders and ICT coordinators only (*Head 2a*).

On the other hand, another respondent believes that the ICT coordinators would have no relation with the implementation (*Head 1a*). For the respondent, ICT coordinators are the people who are responsible for ICT curriculum, but not for technology integration programme (*Head 1a*). With regard to the role of English subject leaders; the respondent suggested that the role is to monitor the implementation (*Head 1a*). Another respondent also believes that the ICT coordinators would have no relation with the implementation because they are responsible for the ICT curriculum (*Head 1b*). The respondent believes that the people who would be responsible for the implementation are the ICT subject leaders and the technical support staffs (*Head 1b*). Another respondent stresses that teamwork is important for the implementation (*Head 3b*). In addition, as suggested by previous respondents, the respondent also believes that ICT coordinators would have no relation with the implementation because they are particularly responsible for the ICT curriculum (*Head 3b*).

### **1.9) What is an effective implementation strategy in addressing negative implications for students in using mobile phones for learning?**

With regard to the strategies in eliminating negative implications, respondents provide various suggestions. A suggestion is to educate the students through the ICT curriculum (*ICT 3a, ICT 1a and ICT 3b*). Another suggestion is to develop a policy to discourage the students from misusing the mobile phones (*ICT 3a, ICT 1a and ICT 3b*). Another respondent relates to the existing practice at school; by raising parents' awareness in guiding students to use the technology appropriately (*ICT 3a*).

In addition, school enforcement which highlighted the consequences of the misuse was also suggested (*Head 3a and Head 3b*). Seven respondents also believe that it is important to raise students' awareness regarding the emerging issues in using mobile phones (*Head 1a, Head 1b, Head 3a, Head 2, ICT 3a, ICT 2 and ICT 1b*).

These are health issue, security issues and misuse (*Head 1b, Head 3a and Head 2*).

A respondent also has a concern about cyber-bullying (*Head 2*). The respondent suggests the following approaches to address this issue; to secure students' phone numbers, to encourage students to protect their phone numbers and to establish a clear protocol in protecting certain data or information (*Head 2*). The respondent also suggests setting anonymous numbers for students and to encourage the school to cooperate with the police and private companies to deal with cyber-bullying (*Head 2*).

## Evaluation in preliminary field tests: concept 3 (technology)

This section addresses the research sub-questions associated with technology which was highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The research sub-questions are developed to evaluate the suggestions which are included in the implementation strategy. There are three sub-questions associated with this concept:

- 1.10) What is an effective implementation strategy in obtaining funding for the implementation?
- 1.11) What is an effective implementation strategy in enabling students to acquire mobile phones to be used in the implementation?
- 1.12) What is an effective implementation strategy in managing and maintaining the devices in the implementation?

### **1.10) What is an effective implementation strategy in obtaining funding for the implementation?**

Respondents provide several approaches in funding the implementation. A respondent suggests obtaining funding from the specialist school trust (*Head 3a*). Other approaches are to obtain funding from the private companies (*Head 3b, 3a and Head 2*), subsidy (*Head 2*), donation from authorities (*Head 1b*), government (*Head 3b*) and parents' contribution (*Head 3b*).

### **1.11) What is an effective implementation strategy in enabling students to acquire mobile phones to be used in the implementation?**

In addition to the strategies in obtaining funding for the implementation, strategies to help students acquire mobile devices is also important. One of the suggestions is to encourage parents' to contribute financially in acquiring the devices (*Head 1b, Head 2 and Head 3b*).

However, for the students who could not afford to purchase mobile devices, respondents suggest to apply subsidy or hardship funding (*Head 3a*) and loan stock (*Head 1a*). Other suggestions are to encourage private companies' sponsorship

(*Head 2*), to utilise second hand machinery (*Head 3a*) and to utilise students' own devices (*Head 2*).

### **1.12) What is an effective implementation strategy in managing and maintaining the devices the implementation?**

The first issue to be addressed in the management and maintenance of implementing mobile learning is to prevent students from damaging and losing the devices. An approach is by giving the opportunities to students to customise their devices (*ICT 3c and ICT 4a*). The respondents believe that this is useful in that it would encourage students to enjoy having the devices; which would eventually raise a sense of ownership (*ICT 3c and ICT 4a*). Two respondents emphasise the importance of raising students' awareness to have a sense of responsibility towards the devices (*ICT 3c and ICT 4b*). Three respondents suggest school's enforcement to manage and maintain the devices (*ICT 3c, ICT 1b and ICT 1a*). A respondent was more specific by suggesting developing a policy (*ICT 3b*).

Respondents also suggest other strategies to address damage and lost. A suggestion is to manage and maintain the devices through insurance (*ICT 3c, ICT 3a and ICT 2*). A respondent relates to the existing practice at a school, where the insurance was purchased in a laptop programme (*ICT 3a*). Another suggestion is to protect the devices with a password (*ICT 4a*). Respondents also suggest using basic mobile phones to prevent students from purposely losing the devices; this would discourage them to claim for new devices while selling the existing devices (*ICT 2*) and to mark the devices to be identified in the event of loss (*ICT 3c*).

Another important issue in the management and maintenance of the devices is to prevent mobile devices from theft. A respondent believes that encouraging students to have a responsibility towards their devices is necessary (*ICT 1a*). While having a responsibility towards the devices is important, other respondents suggest locking the devices with password to discourage theft (*ICT 1a, ICT 4a and ICT 3a*). Two respondents suggest marking the devices to be identified in the event of theft (*ICT 3c and ICT 1a*). Other countermeasures proposed by the respondents are to use tracking devices to track the devices in the event of theft (*ICT 4b*). Other suggestions are to use basic mobile phones to make the phones less attractive to

theft (*ICT 2*) and to apply an acceptable use policy to sanction students who steal other people's devices (*ICT 3b*).

Another major issue addressed in the management and maintenance of implementing mobile learning is faulty. A respondent suggests providing centralised helpdesk (*ICT 2*). Another suggestion is to obtain support from the supplier (*ICT 3c and ICT 1b*). Two respondents also suggest providing on-site maintenance (*ICT 3c and ICT 3a*). A respondent stresses that having technical support on-site would have an advantage because it could offer timely services compared to the supplier (*ICT 1a*). In addition, two respondents suggest to purchase insurance (*ICT 3b and ICT 4b*). Another approach proposed by the respondent is encouraging parents to contribute financially towards the maintenance (*ICT 4a*). Finally, a respondent suggests providing replacement while the broken devices are repaired (*ICT 3a*).

## Evaluation in preliminary field tests: justification of the revision

The implementation strategy as outlined in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A was revised based on the findings in the preliminary field tests. The findings from the preliminary field tests established the consensus with the implementation strategy developed in the study. However, there are some areas, which have been improved by the suggestions raised by the respondents. The following were the improvements based on the findings from the preliminary field tests:

1. The structure of the mobile lesson was revised. As pointed out by a respondent (*English 2*), the example provided in the mobile lesson was incorrect. Therefore, the structure was revised and a new example is provided in 1.1 Mobile lessons, page 1-2.
2. The schedule to deliver the mobile lessons was revised. In the initial development of the implementation strategy, three new words are suggested to be delivered every alternate day; on Monday, Wednesday and Friday so that there would be nine words delivered in a week. However, a respondent (*English 4a*) stresses the importance of repetition in vocabulary learning. This concurs with the view of Genesee (2000), who highlighted that repetitive experiences are required in order to learn new words. The respondent suggests delivering six identical words every alternate day. The suggestion was included in 1.1 Mobile lessons, page 2-3.
3. A respondent suggests encouraging the students to use their own device in the implementation (*Head 2*). This is parallel to the report by Evans and Moss (2010) to encourage students to use their own devices in mobile learning. The suggestion was included in 1.2 Resourcing mobile learning, page 6.
4. Five respondents suggest purchasing insurance or additional warranty coverage (*ICT 3b, ICT 4b, ICT 3c, ICT 3a and ICT 2*). This is parallel to the opinion by Pownell and Bailey (2003), to consider purchasing insurance to manage and

maintain the devices in technology integration. The suggestion is included in 2.3 Management and Maintenance, page 10.

5. Two respondents suggest encouraging teachers to contribute in the pilot project (*Head 1b and Head 3b*). This is parallel to the opinion by Pownell and Bailey (2003), to provide the opportunities for the teachers to participate in shaping the ICT programme so that it would instil a sense of ownership. The suggestion is included in 2.5 Support for major stakeholders, page 12.

6. A respondent suggests implementing mobile learning gradually rather than introducing it in whole schools (*Head 3b*). This is parallel to the opinion by Hartnell-Young and Heym (2008), that mobile phones should be deployed gradually in schools until mobile phones is accepted as a common learning tool. This suggestion is included in 2.5 Support for major stakeholders, page 12-13.

7. A respondent suggests considering student's voice, which would provide the opportunity for the students to explain to the teachers regarding their interest to use latest technology in learning activities such as mobile phones (*Head 3a*). This would help to raise positive attitude among teachers about the implementation (*Head 3a*). This is parallel to the opinion by Vavoula *et al.* (2004) who highlighted the role of students as a promoter in integrating technology in education. This suggestion is included in 2.5 Support for major stakeholders, page 12.

8. A respondent suggests encouraging students to contribute to a pilot study to foster their support (*Head 1b*). This is parallel to the opinion by Nielsen and Webb (2011) about the importance of the pilot program before deploying mobile phones in schools. This suggestion is included in 2.5 Support for major stakeholders, page 13.

9. A respondent suggests multiple approaches to inform parents about the implementation; through documents, e-mail, school websites and parents' evening so that parents can be reached according to their preference and availability (*Head 3b*). This suggestion is included in 2.5 Support for major stakeholders, page 13.

10. A respondent suggests reassuring parents that there will be minimal expenses in the implementation to foster their support (*Head 2*). This suggestion is included in 2.5 Support for major stakeholders, page 13.

11. Two respondents suggest providing opportunities for students to customise their devices; this would encourage students to enjoy having the devices, which would eventually instil a sense of ownership (*ICT 3c and ICT 4a*). This suggestion is included in 2.3 Management and maintenance, page 10.

12. Two respondents stress the importance of raising students' awareness to be responsible towards their devices (*ICT 3c and ICT 4b*). This is parallel to the opinion by Pownell and Bailey (2003), to encourage students to have the responsibility towards their devices. This suggestion is included in 2.3 Management and maintenance, page 10.

13. A respondent suggests utilising basic mobile phones to prevent students from purposely losing their devices to claim for new devices while selling the existing devices (*ICT 2*). This suggestion would also ensure that the mobile phones would be less attractive to theft (*ICT 2*). This suggestion is included in 2.3 Management and maintenance, page 10.

14. There are various suggestions in the provision of technical support. However, the suggestion raised by the ICT subject leader 2 to provide centralised helpdesk in dealing with faulty was chosen. This would ensure that only minimal cost is required at the beginning of the implementation. This suggestion is included in 2.4 Specific roles for supporting mobile learning at schools, page 11.

15. Two respondents also suggest getting support from the supplier in maintaining and managing the devices (*ICT 3c and ICT 1b*). This additional suggestion is also included in 2.4 Specific roles for supporting mobile learning at schools, page 11.

16. A respondent suggests the following responsibilities for the technical support staff (help desk); to conduct periodic checks and to perform early diagnoses for the

broken facilities (*ICT 3c*). This suggestion is included in 2.4 Specific roles for supporting mobile learning at schools, page 11.

17. Two respondents suggest delivering the mobile lessons in the afternoon after the students finish their school sessions to complement the students' daily activities (*English 2 and English 3*). Based on this suggestion, the delivery of the mobile lessons is revised to complement the Malaysian school sessions. The revision is included in 1.1 Mobile lessons, page 2.

18. Seven respondents suggest encouraging students to contribute as a maintenance assistant (*ICT 4a, ICT 3a, ICT 1a, ICT 2, ICT 3c, ICT 1b, ICT 3b*). This is parallel to the opinion by Pownell and Bailey (2003), Apple Computer (2005) and Gateway (2008) about the significance of encouraging students to contribute as assistance for technical support. This suggestion is included in 2.4 Specific roles for supporting mobile learning at school, page 11.

19. A respondent suggests possible approaches to address the issue of cyber-bullying to safeguard students (*Head 2*). This suggestion is included in 2.5 Support for major stakeholders, page 12-13.

20. There are various suggestions in the provision of ICT coordinator. However, three respondents believe that ICT coordinators would have no relation with the implementation because they are responsible for ICT curriculum, not for technology integration (*Head 1a, Head 1b, Head 3b*). Therefore, the role of ICT coordinators was omitted from 2.4 Specific roles for supporting mobile learning at school, page 11.

21. Three respondents suggest locking the devices with password to discourage theft (*ICT 1a, ICT 4a and ICT 3a*). This suggestion is included in 2.3 Management and maintenance, page 10.

There are some suggestions, which were not implemented. The following note the suggestions, which were not included in the revised version of the implementation strategy.

1. Regardless of the suggestion by a respondent to apply a voice mechanism in the mobile lesson (*English 4a*), the original structure of the mobile lesson was maintained, which is to concentrate on deploying SMS rather than MMS. This suggestion was not considered as the main approach in the implementation strategy because of the cost issue. However, this suggestion is included as an additional approach in 1.1 Mobile lessons, page 3.
2. Three respondents suggest educating students through ICT curriculum to address the issue of negative implications (*Head 3a, Head 1a and Head 3b*). However, this suggestion is not included in the implementation strategy because the ICT subject is not compulsory in Malaysian schools.
3. A respondent suggests obtaining funding from the specialist school trust (*Head 3a*). However, this suggestion is not included in the implementation strategy because the trust does not exist in Malaysia.
4. A respondent suggests using second hand devices to help students acquire mobile phones (*Head 3a*). However, this suggestion is not included in the implementation strategy because second hand machinery might not be as robust as the new device.

The following table summarises the findings which contribute towards the revision of the implementation strategy. The tables indicate the revisions in the aspects of structure, content, policy and practice through the preliminary field tests which were previously discussed in Evaluation in preliminary field tests: justification of the revision. The aspect of structure refers to the revision in the proposed structure of the mobile lessons, while the aspect of content refers to the revision in the proposed content of the mobile lessons. Regarding the aspect of policy and procedure, it covers the revision of the suggestion in the management of mobile learning. The aspect of practice covers the management approach in mobile learning which have direct implication on students. Revisions are made either from the respondent's perspective or by the combination of the respondent's perspective and literature.

	<b>Change type</b>	<b>Source of data in preliminary field tests</b>	<b>Reference in the implementation strategy (Preliminary field tests) as Appendix A</b>	<b>Research question</b>
1.	Structure	Respondent	1.1 Mobile lessons, page 1-2	1.1
2.	Content	Respondent and literature	1.1 Mobile lessons, page 2-3	1.4
3.	Practice	Respondent and literature	1.2 Resourcing mobile learning, page 6	1.11
4.	Policy and procedure	Respondent and literature	2.3 Management and maintenance, page 10	1.12
5.	Policy and procedure	Respondent and literature	2.5 Support for major stakeholders, page 12	1.5
6.	Policy and procedure	Respondent and literature	2.5 Support for major stakeholders, page 12 to page 13	Additional strategy
7.	Practice	Respondent and literature	2.5 Support for major stakeholders, page 12	1.6
8.	Practice	Respondent and literature	2.5 Support for major stakeholders, page 13	1.6
9.	Policy and procedure	Respondent	2.5 Major support for major stakeholders, page 13	1.7
10.	Policy and procedure	Respondent	2.5 Support for major stakeholders, page 13	1.7
11.	Practice	Respondent	2.3 Management and maintenance, page 10	1.12
12.	Practice	Respondent and literature	2.3 Management and maintenance, page 10	1.12
13.	Practice	Respondent	2.3 Management and maintenance, page 10	1.12
14.	Policy and procedure	Respondent	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
15.	Policy and procedure	Respondent	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
16.	Policy and procedure	Respondent	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
17.	Practice	Respondent	1.1 Mobile lessons, page 2	1.3
18.	Practice	Respondent and literature	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
19.	Policy and procedure	Respondent	2.5 Support for major stakeholders, page 12 to page 13	1.9
20.	Policy and procedure	Respondent	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
21.	Policy and procedure	Respondent	2.3 Management and maintenance, page 10	1.12

**Table 11: Summary of the findings in preliminary field tests in the indication of the contribution in the revision of the implementation strategy**

## Summary

This section discusses the revision of the implementation strategy, which is named as “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)” as Appendix A. The revision is based on the findings from the preliminary field tests, which are conducted in four schools in Hampshire and Southampton.

The preliminary field tests established the strategy to implement mobile learning via mobile phones in Malaysian secondary schools. To support the English vocabulary acquisition in Malaysian schools, the mobile lessons are projected to be delivered through Short Message Service (SMS), which consists of vocabulary introduction and explanation, vocabulary review through multiple-choice questions and feedback mechanism. In integrating the mobile lesson to the existing curriculum, the mobile lessons are formulated to be integrated into learning activities at schools such as listening, speaking, reading and writing. The mobile lessons are projected to conform to the syllabus provided by the Ministry of Education, Malaysia.

To fit in with the students’ daily activities, the mobile lessons are formulated to be delivered according to secondary school sessions. The mobile lessons are suggested to be delivered three times a week, at 8 pm on Monday, Wednesday and Friday for morning sessions’ students and at 8 am on Monday, Wednesday and Friday for afternoon sessions’ students. The delivery schedule was also established to ensure that the students would be able to master the mobile lessons efficiently. Each time mobile lessons is delivered; six same new words will be introduced to students. This approach stresses the importance of repetition in vocabulary learning.

It is also important to formulate the strategies to prepare teachers with the proper attitude, sufficient knowledge and skills for the implementation. Training is important to ensure that the teachers would be well informed regarding the benefits and objectives of the implementation, as well as to be provided with hands-on professional learning which is essential in implementing mobile learning. Awareness about the safety, security and ethical issues surrounding the use of

mobile devices in education are also important to enable the teachers to apply that understanding in practice. Teachers might be given ongoing support, sufficient time to explore the devices and to be encouraged to contribute in the pilot project to initiate a sense of ownership. Partnership with local universities, education organisations and other institutions are also encouraged so that schools will be able to gain expertise and support for training purpose. Finally, it is also advisable to implement mobile learning gradually, starting from one level to another. For example, at the beginning of the implementation, it might be worthwhile to introduce mobile learning to the Form 1 students before introducing it to whole schools.

The preliminary field tests also established the importance of support for students. It is important to conduct induction sessions so that students can explore issues associated with mobile learning utilisation; the benefits and objectives, knowledge and skills required in the implementation. Awareness about the safety, security and ethical issues surrounding the use of mobile phones in education are also important to enable the students to apply the knowledge in practice. On-going support is also important to foster motivation throughout the implementation. The study also established the importance of the student's voice, which would provide the opportunity for the students to explain to the teachers regarding their interest to use latest technology in learning activities such as mobile phones. This would help to raise positive attitude among teachers about the implementation. It is also worthwhile to give the opportunity to the students to customise their devices; this would encourage students to enjoy having the devices, which would eventually instil a sense of ownership. Another approach in supporting the students in the implementation is to encourage students to contribute in the pilot project to initiate a sense of ownership.

The importance of support for parents is also established. There are several possible ways to ensure that parents are well-informed about the implementation in order to foster their support. They can be informed through support documents or letters, school websites and special events such as information day, parents' evening, weekend meeting, Parents Teachers Association meeting, or school open day. Briefing sessions are also important to disseminate important information such as the benefits and objectives of the implementation, parents' role in the

implementation, as well policies and procedures. Other important issues for parents' awareness are safety, security and ethical issues surrounding the use of mobile devices to support them in monitoring their children to use mobile devices productively. Parents should also receive information about their children's progress from time to time. Finally, to foster parents' support, parents should also be assured that there will be minimal expenses in the implementation.

The preliminary field tests also established that to support the implementation, there is a need to assume or assign specific roles, namely the English language subject leader, technical support staff (help desk) at each school or centralised help desk depending on demand and students as additional support to assist the technical support staff (help desk).

With regard to eliminating the negative implications for students in using mobile phones in education, the first approach is through induction sessions. Through induction sessions, students will have the awareness of safety, security and ethical issues surrounding the use of mobile phones in education which would help to address the issue of the negative implications on students. Another sensible approach is through the Acceptable Use Policy (AUP). With the Acceptable Use Policy (AUP), students will be guided by rules to prevent issues associated with intentional and unintentional misuse of mobile technologies. Finally, it is also worthwhile to safeguard students with practical countermeasures in addressing the issues of cyber bullying.

With regard to the funding, the preliminary field tests established that the key strategy is to gain contribution from the government. However, it might be appropriate to encourage private companies such as mobile phone manufacturer and mobile network provider to contribute towards the implementation by providing easy-payment schemes. The government might also consider collaborating with content developers by offering incentives for their contributions. The use of open source software might also be considered.

The preliminary field tests also established two schemes to support students to acquire mobile phones; Ownership and Loanership. For Ownership, parents are

encouraged to contribute towards the cost of the devices so that students will have the full ownership. The total cost of the mobile phones will be spread over five years, which is for the whole duration of secondary school education in Malaysia (from Form 1 to Form 5). With regard to the Loanership, this model is formulated specifically for students who could not afford to purchase the devices. The parents and students are required to comply with the Loan Scheme Agreement which is to take proper care of the devices. Another alternative is to use students' own devices. It is also important to develop and establish procedures in order to manage and maintain the devices in the implementation. Possible procedures are applying serial number or identification code and password to the devices, keeping a systematic inventory of the devices, providing protective case, applying mobile theft solution, providing temporary supplies or loan stocks to students while waiting for the devices to be repaired and purchasing insurance or additional warranty coverage. It is also worthwhile to apply an acceptable use policy to sanction students who steal other people's devices. It is also advisable to utilise basic mobile phones discourage theft cases. This would also address the issue of insurance fraud because it would refrain the students from deliberately lose the mobile phones with the intention to claim the money. Moreover, it is also useful to raise student awareness through induction sessions to have a responsibility towards the devices. Finally, it is also beneficial to provide an opportunity to the students to customise their devices. This is to boost a sense of ownership which will eventually raise students' responsibility towards the devices.

The findings from the preliminary field tests described throughout this section provide valuable information that effectively shaped the revised version of the implementation strategy. The preliminary field tests provide much insight into the strengths and weaknesses of the implementation strategy. However, there was a tension in determining the suggestions that are selected in the revised version of the implementation strategy. While some of the justifications are supported by literatures, some of the justifications are based purely on the sensibility of the suggestions.

Regardless of the challenges in revising the implementation strategy, a new version of the implementation strategy is developed. The new version of the implementation

strategy is named as “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)”. This version is included as Appendix B. However, this version is further developed from the findings gathered in the main field tests and evolved as the results of the main field tests. The next section continues with the revision of “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” based on the findings from the main field tests.

## Evaluation of the implementation strategy: main field tests

Main field tests were conducted in nine schools in Malaysia. The respondents are English subject leaders, ICT subject leaders, head teachers and deputy head teachers. The aim of the main field tests is to evaluate the implementation strategy for implementing mobile learning which is highlighted in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B and to bring in the perspectives from the educational experts in Malaysia. In the main field tests, the following research question is explored:

**What is an effective implementation strategy in utilising mobile learning for the English Language vocabulary acquisition in Malaysian secondary schools?**

To answer this research question, three concepts are explored; pedagogy, stakeholder and technology. These concepts become the basis of the sub-questions:

Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?		
 Pedagogy	 Stakeholder	 Technology
<p>1.1 What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?</p> <p>1.2 What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?</p> <p>1.3 What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?</p> <p>1.4 What is an effective implementation strategy in delivering mobile lessons to enable students master the mobile lessons?</p>	<p>1.5 What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills for the implementation?</p> <p>1.6 What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills for the implementation?</p> <p>1.7 What is an effective implementation strategy in ensuring that parents are well-informed about the implementation to foster their support?</p> <p>1.8 What is an effective implementation strategy in proposing important roles to support the implementation?</p> <p>1.9 What is an effective implementation strategy in addressing negative implications on students in using mobile phones in education?</p>	<p>1.10 What is an effective implementation strategy in obtaining funding for the implementation?</p> <p>1.11 What is an effective implementation strategy in enabling students acquiring mobile phones to be used in the implementation?</p> <p>1.12 What is an effective implementation strategy in managing and maintaining the devices in the implementation?</p>

Figure 30: Research question 1 and the sub-question

## Evaluation in main field tests: concept 1 (pedagogy)

This section addresses the research question associated with the pedagogy which was highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B. The sub-questions are developed to evaluate the suggestions which are included in the implementation strategy. There are four sub-questions associated with this concept:

- 1.1) What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?
- 1.2) What is an effective implementation strategy in integrating mobile lesson into the existing curriculum?
- 1.3) What is an effective implementation strategy in delivering mobile lessons so that it could fit with students daily activities?
- 1.4) What is an effective implementation strategy in delivering mobile lessons to enable students to master the lessons?

### **1.1) What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?**

The respondents were asked regarding the pedagogical soundness of the mobile lessons which has been established in the study. The structure of the mobile lessons in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B was highlighted to the respondents. Five respondents agree that the structure of the mobile lessons is pedagogically sound for English vocabulary acquisition (*English 5, English 8, English 9, English 7, English 11*).

However, the respondents also discovered some areas for improvement. A respondent suggests introducing family words and root words associated with the words introduced in the mobile lessons (*English 12*). The respondent also suggests

introducing mathematics and science terminology to enrich students' knowledge (*English 12*).

Four respondents also suggest to replace the example provided in the mobile lessons with simple sentences (*English 5, English 10, English 11, English 7*). They stress the importance of providing simple examples to students who learn English as a second language to enhance learning (*English 5, English 10, English 11, English 7*).

Two respondents suggest to include pronunciation mechanism to help students to learn to pronounce the word introduced in the mobile lessons (*English 9, English 13*). A respondent also proposes to customise the mobile lessons accordingly; to suit lower secondary school students and upper secondary school students, and suggests providing simple examples in the mobile lessons to the lower secondary school students (*English 13*).

A respondent believes that it is not appropriate to explain the word in Malay Language because students might misunderstand the meaning of the words when translated directly into Malay Language (*English 6*). Therefore, the respondent proposes to introduce the word through simple English sentences.

### **1.2) What is an effective implementation strategy in integrating mobile lesson into the existing curriculum?**

Regarding this question, the respondents suggest two possible strategies to integrate the mobile lessons into the curriculum. An approach is to encourage the students to deploy the mobile lessons in essay writing (*English 12, English subject leader 5, English 9, English 13, English 7, English 11*). Six respondents also suggest to deploy the mobile lessons for revision purpose (*English 5, English 9, English 13, English 6, English 10, English 11*).

### **1.3) What is an effective implementation strategy in delivering mobile lesson so that it could fit in with the students' daily activities?**

In this study, mobile lessons are suggested to be delivered every alternate days; Monday, Wednesday and Friday. For the students who attend the school in the

morning, the mobile lessons are projected to be delivered in the evening. On the other hand, for the students who attend the school in the afternoon, the mobile lessons are projected to be delivered in the morning. Nine respondents agree with the suitability of the schedule to fit in with the students' daily activities (*English 12, English 5, English 8, English 9, English 13, English 6, English 7, English 10, English 11*). Two respondents suggest that the mobile lessons ought to be delivered within the appropriate time in the morning and the evening (*English 7, English 9*). Moreover, a respondent also suggests delivering the mobile lessons according to the students' preference (*English 13*).

#### **1.4) What is an effective implementation strategy in delivering mobile lessons to enable students to master the lessons?**

With regard to this question, respondents' answers vary. A respondent agrees with the suggestion as proposed in the implementation strategy (*English 8*). Two respondents are unsure with the number of words which should be introduced in the mobile lessons. They believe that the ability to master the lessons would depend on the students' level of performance; students who have good memory are unlikely to have difficulty in mastering the lessons, but it might be a challenge for students who are on the contrary (*English 11, English 10*).

On the other hand, four respondents are clear in their suggestions. A respondent suggests customising the mobile lessons according to students' level of performance; to deliver 3 words to weak student and to deliver 5 or 6 words to good students each time the mobile lessons are delivered (*English 5*). The respondent also suggests delivering the mobile lessons twice a week rather than three times a week. Another respondent believes that sending 6 words each time would be overwhelming and suggested to limit to 3 or 4 words (*English 6*). In addition, another respondent suggests that it would also possible to deliver 10 words each time the mobile lessons are delivered because she believed that it is a good round number and could enhance the grading process (*English 9*).

Finally, a respondent proposes a solution to emphasise on repetition (*English 13*). The respondent suggests the following:

“On Monday you introduce the first six words, on Wednesday you introduce another six words, maybe you can flash the words that the students have learned on Monday, or you have one kind of exercise that covered the words that they have learned earlier on. Okay, you integrate, so at least at the end of the week they have learned 12 words. The last exercise, the student should repeat all the words.”

## Evaluation in main field tests: concept 2 (stakeholder)

This section addresses the research question associated with the stakeholder which was highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B. The research sub-questions are developed to evaluate the suggestions which are included in the implementation strategy. There are five research sub-questions associated with this concept:

1.5) What is an effective implementation strategy in preparing teachers to have the proper attitude, knowledge and skills for the implementation?

1.6) What is an effective implementation strategy in preparing students to have the proper attitude, knowledge and skills for the implementation?

1.7) What is an effective implementation strategy in ensuring that parents are well-informed about the implementation?

1.8) What is an effective implementation strategy in proposing important roles to support the implementation?

1.9) What is an effective implementation strategy in addressing negative implications for students in using mobile phones for learning?

### **1.5) What is an effective implementation strategy in preparing teachers to have the proper attitude, knowledge and skills for the implementation?**

The study established the importance of teachers’ training in implementing mobile learning. Most respondents agree with the importance of teachers’ training and justified their opinions:

Although teachers are familiar with technology, training is also important for the teachers to raise positive attitude about the use of emerging technology in teaching and learning (*Head 12, Head 8, Head 7*).

Although teachers are familiar with mobile phones, training is also important so that teachers can be confident with the technology utilisation (*Head 9*).

Training is necessary for a new programme such as the mobile learning programme for the success of the implementation (*Head 5, Head 13, Head 6, Head 10, Head 11*).

A respondent also suggests raising positive attitude among teachers during the training session (*Head 9*). Another respondent stresses the importance of monitoring and maintaining the teachers' skills throughout the implementation (*Head 6*). Another respondent believes that to change teachers' attitudes might take time and suggests ongoing support and monitoring to raise positive attitude (*Head 13*). Two respondents posit that while most of the teachers would accept change, there are minority of them who will show their resistance (*Head 6, Head 10*). However, a respondent believes that teachers are likely to be optimistic with the technology utilisation if it is necessary and relevant to them (*Head 5*).

#### **1.6) What is an effective implementation strategy in preparing students to have the proper attitude, knowledge and skills for the implementation?**

The significance of conducting induction sessions to prepare students with the proper attitude, sufficient knowledge and skills for the implementation was established in the study. Five respondents agree with the suggestion and believe that induction session is a viable approach to support students in the implementation (*Head 12, Head 9, Head 13, Head 7, Head 11*).

A respondent suggests concentrating on the concept and the objective of the implementation through the induction session to raise positive attitude among the students (*Head 9*). The respondent justifies that student as digital natives are technology literate and students are unlikely to face difficulties in using technology, therefore the induction session should emphasise on mind setting rather than knowledge and skills (*Head 9*). In addition, another respondent suggests encouraging the students to use mobile phones appropriately and productively through the induction session (*Head 8*).

A respondent believes that the success of the induction depends on the students' attitude (*Head 13*). The induction session would be effective to support students who are receptive towards changes (*Head 13, Head 10*). Therefore, a respondent's point out that besides induction, ongoing support is also important to ensure that students would have the proper attitude, sufficient knowledge and skills for the implementation (*Head 13*).

However, a respondent is sceptical about the suggestion to change students' attitudes with induction (*Head 5*). The respondent believes that knowledge and skills can be raised through induction, but not the attitude and emphasises that students' attitude might be influenced on the location they belong to, for students in urban areas they would be more interested to learn English Language compared to students in rural areas. The respondent believes that students in urban areas would be more positive towards the programme. Compared to students in rural areas, students in urban areas would value the significance of English subject in their life.

### **1.7) What is an effective implementation strategy in ensuring parents are well informed about the implementation?**

The significance of briefing sessions to ensure that parents are well-informed about the implementation to foster their support was established in the study. Six respondents agree with the suggestion and they also agree that briefing sessions are parallel to the existing practices in schools in communicating with parents (*Head 12, Head 8, Head 9, Head 13, Head 6, Head 10*). In addition, a respondent suggests including technical knowledge in the briefing sessions; so that parents would have the knowledge to look for inappropriate content on their children's mobile phones (*Head 5*).

Two respondents predict that the briefing sessions would help to disseminate about the implementation because parents are usually positive in their school activities (*Head 12, Head 8*). Five respondents stress that briefing sessions are necessary to foster parents' support (*Head 8, Head 9, Head 13, Head 6, Head 10*).

A respondent was unsure whether the briefing sessions would be effective to ensure that the parents are well informed to foster support because mobile learning

is a new teaching and learning approaches and it is difficult to predict parents' responses (*Head 5*). On the other hand, three respondents believe that parents' responses towards briefing session will be influenced by the areas they belong to (*Head 11, Head 5, Head 9*). They believe that parents in urban areas are likely to support any activities which would help their children to achieve the schools' target (*Head 11, Head 5, Head 9*). They also believe that in rural areas, parents' responses are usually not as good as parents' responses in urban areas (*Head 11, Head 5, Head 9*).

However, a respondent believes that head teachers' reputation is a factor which could foster parents' support in the implementation of mobile learning (*Head 12*). The respondent believes that head teachers with a good reputation would attract parents to support educational activities conducted by the schools (*Head 12*).

#### **1.8) What is an effective implementation strategy in proposing important roles to support the implementation?**

The study established the significance of allocating technical support staff to support the implementation of mobile learning. Respondents have various perspectives regarding the approach to allocate technical support staff. Six respondents suggest providing additional technical support depending on the size of the schools (*ICT 12, ICT 5, ICT 8, ICT 9, ICT 6, ICT 10*). They believe that for large schools, additional technical support is essential (*ICT 12, ICT 5, ICT 8, ICT 9, ICT 6, ICT 10*). A respondent suggests that the position as technical support staff can also be offered as a part time job (*ICT 5*).

Another suggestion by the respondents is to use existing technical support at schools (*ICT 12, ICT 8, ICT 13, ICT 7, ICT 10, and ICT 11*). Six respondents believe that this approach is suitable for small schools; however, training is essential so that the existing technical support staff will have the skills and knowledge to manage and maintain the facilities in mobile learning utilisation (*ICT 12, ICT 8, ICT 13, ICT 7, ICT 10, and ICT 11*).

Sharing technical support among schools is also suggested by the respondents

(*ICT 12, ICT 8, ICT 13, ICT 6, and ICT 7*). This approach is suggested to reduce costs in implementing mobile learning. A respondent reports that this approach has been practiced at the school and the neighbouring schools: a company known as Rebound Asia Malaysia provides technical support staff to be shared with some schools in Terengganu, Malaysia (*ICT 8*). However, two respondents argue about this approach because they believe that issues will arise in the logistic and the organisation of sharing technical support (*ICT 7, ICT 11*). They also stress that it might be difficult for the technical support staff to provide similar attention to all schools (*ICT 7, ICT 11*).

The final suggestion raised by the respondents is to appoint teachers as technical support staff (*ICT 5, ICT 13*). The respondents believe that teachers are suitable to be appointed as technical support staff providing that their teaching hours are reduced and training sessions are provided to them.

In the implementation strategy, the importance of appointing students as maintenance assistance to help the technical support staff is established. Seven respondents agree that students' involvement would help in managing and maintaining the facilities (*ICT subject leader 12, ICT subject leader 5, ICT subject leader 8, ICT subject leader 13, ICT subject leader 6, ICT subject leader 7, ICT subject leader 10*). Five respondents point out that this approach is similar to the existing practices at their schools (*ICT subject leader 8, ICT subject leader 13, ICT subject leader 6, ICT subject leader 7, ICT subject leader 10*). Currently, in Malaysian secondary schools, students help technical support staff in managing and maintaining computer laboratories through students' organisations which are known as Cyber Brigade in Smart Schools and Computer Club in non-Smart Schools (*ICT 12, ICT 8, ICT 13, ICT 6, ICT 7, ICT 10*). There are several reasons raised by the respondents in supporting the students' involvement as maintenance assistants. A respondent believes that involving students as maintenance assistance would help the student when applying for further studies in higher institutions (*ICT 6*). Two respondents believe that students' involvement would help to enrich their knowledge in technology (*ICT 10, ICT 5*). However, a respondent emphasises that students should only be involved during out of school hours (*ICT 10*).

The study also established the importance of appointing an English subject leader as a supporting role. With regard to this role, the responses from the respondents vary. Six respondents agree with the suggestion to include English subject leader in the implementation (*English 12, English 9, English 6, English 7, English 11, English 8*). For these respondents, they believe that it is part and parcel of being an English subject leader to be involved in such programme. However, there are concerns from three respondents and they believe that including English subject leader in the implementation may increase their workload (*English 5, English 13, English 10*).

### **1.9) What is an effective implementation strategy in addressing negative implications for students in using mobile phones for learning?**

The study established the importance to apply an acceptable use policy to address the issue of negative implications on students resulted from the use of mobile phones. Five respondents agree with the suggestion and believe that enforcing rules to guide students in using mobile phones is essential (*Head 12, Head 5, Head 9, Head 8, Head 10*). A respondent believes that policy enforcement would be more successful with parents' involvement (*Head 9*). The respondent suggests acknowledging the parents about the policy during the briefing sessions so that they would be able to monitor their children (*Head 9*).

However, four respondents believe that although through the acceptable use policy negative implications can be addressed, it might be possible that there are students who would be reluctant to comply (*Head 5, Head 10, Head t 7, Head 11*). Three respondents also believe that there would be an extra burden for the teachers; monitoring is necessary in applying the policy (*Head 5, Head 8, and Head 6*). Another issue raised by a respondent is the challenge to enforce the policy for personal mobile phones (*Head 9*). The respondent believes that it would be difficult for schools to monitor mobile phones owned by students compared to loan devices (*Head 9*).

Another approach established in the study to address the issue of negative implications is to raise students' awareness through induction sessions regarding the ethical, safety and security issues. Five respondents agree that induction sessions would help to raise students' awareness regarding these issues (*Head 12,*

*Head 5, Head 9, Head 13, Head 10*). However, six respondents believe that there are students who would be less receptive to the approach (*Head 5, Head 13, Head 8, Head 6, Head 7, Head 11*).

## Evaluation in main field tests: concept 3 (technology)

This section addresses the research questions pertaining to technology in implementing mobile learning which is highlighted in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B. There are three research sub-questions related to this concept:

- 1. 10) What is an effective implementation strategy in obtaining funding for the implementation?
  
- 1.11) What is an effective implementation strategy in enabling students to acquire mobile phones to be used in the implementation?
  
- 1.12) What is an effective implementation strategy in managing and maintaining the devices in the implementation?

### **1.10) What is an effective implementation strategy in obtaining funding for the implementation?**

There are two possible approaches in funding the implementation. The first approach established in this study is to obtain funding from private companies. When asked, respondents provide various feedbacks. Two respondents agree with the approach and believe that major mobile phone manufacturer such as Maxis, Malaysia and network provider like Celcom, Malaysia would be able to provide an easy payment scheme (*Head 12, Head 6*). Another respondent was also positive and highlights the existing contribution of the private companies in providing second-hand computer to schools (*Head 13*).

However, another respondent stresses that it is unlikely to receive contribution from private companies and their contributions are limited (*Head 10*). Another respondent believes that private companies are likely to be selective; their contributions might be limited to certain schools only (*Head 9*). The respondent believes that private companies are inclined to choose schools in urban areas because of profit intention and to achieve a return from their investment (*Head 9*).

Another respondent also raises similar opinion (*Head 5*). The respondent believes that private companies might be interested to contribute if they are able to obtain a return on their investment (*Head 5*). This opinion is also supported by other respondents, where they believe that private companies always focus on profit making (*Head 5, Head 7*).

Another respondent reports that there is a non profit company known as Yayasan Al Bukhari which contributed to some schools in Terengganu state, but overall it is unlikely to find institutions or companies which are interested to contribute (*Head 11*).

Two respondents report that there are some contributions from private companies in integrating technology in schools, although their contributions are minimal (*Head 13, Head 8*).

Therefore, respondents believe that the government's contribution is the most viable approach in funding the implementation. Five respondents believe that government would be willing to contribute and it has been the government vision to integrate ICT in teaching and learning (*Head 12, Head 9, Head 6, Head 8 and Head 13*). Two respondents believe that the implementation would be funded by the government if it could bring the benefit to education (*Head 7, Head 10*). Another respondent predicts that in the beginning, the government would be able to support some schools such as the Malaysian Smart Schools because these schools focus on integrating ICT in teaching and learning (*Head 11*).

However, a respondent was unsure with the government's willingness to support the implementation because of the existing policy which prohibits the use of mobile phones at schools (*Head 8*). In addition, a respondent believes that it might not be difficult to receive funding from the government, but the problem would be to maintain the facilities (*Head 5*).

**1.11) What is an effective implementation strategy in enabling students to acquire mobile phones to be used in the implementation?**

The study established two schemes which could support students to acquire mobile phones to be used in the implementation. These are loan scheme and purchase scheme. The respondents agreed with both suggestions. With regard to the loan scheme, their reasons include:

Loan scheme could help the minority of students who come from lower income backgrounds (*Head 9, Head 6*).

Loan scheme would be welcomed by parents because it will help to reduce their financial burden (*Head 5*).

Loan scheme could help to support the mobile learning programme to be implemented throughout the country (*Head 13, Head 10*).

However, a respondent believes that there will be issues in applying the loan scheme (*Head 5*). The respondent stresses that students are inclined to be less responsible towards loan items, which he literally based on the current situation in the text book scheme in Malaysian schools (*Head 5*). In addition, the respondent predicts that there might be an increase on the school's and teachers' workload in managing the scheme (*Head 5*).

The respondents justify their opinion regarding the purchase scheme. Eight respondents believe that mobile phones are a common tool and most students could afford to purchase a simple type of mobile phones (*Head 12, Head 5, Head 8, Head 9, Head 13, Head 6, Head 10, Head 11*). A respondent believes that by applying purchase scheme, it would encourage students to be more responsible because they have to contribute towards the devices (*Head 5*). In addition, two respondents believe that parents are always willing to contribute financially for their children's benefit (*Head 8, Head 11*).

While other respondents believe that parents are willing to contribute towards purchasing the mobile devices, a respondent was adamant that purchase scheme

would cause parents' uproar (*Head 5*). Finally, in addition to loan scheme and purchase scheme, a respondent suggests using Parents Teachers Association fees or student support fund to help students acquire mobile devices (*ICT 13*).

### **1.12) What is an effective implementation strategy in managing and maintaining the devices in the implementation?**

There are various approaches in managing and maintaining the devices which has been highlighted in the implementation strategy. However, it was beyond the scope of the main field tests to gain perspective from the respondents about entire strategies that have been highlighted. Therefore, the main field tests emphasised on the most important approaches to be evaluated. The decision was made based on the literature review (Pownell and Bailey, 2003; Williams, 2006). The first approach which was evaluated by the respondents is to apply the acceptable use policy in managing and maintaining the devices. Six respondents agree that by applying the acceptable use policy, it would help to discourage students from damaging or vandalising the facilities in the implementation (*ICT 12, ICT 5, ICT 9, ICT 8, ICT 7, ICT 10*). These respondents believe that through this policy, students would be aware of the consequences of misconduct and this would eventually discourage the students from conducting misuse (*ICT 12, ICT 5, ICT 9, ICT 8, ICT 7, ICT 10*). In addition, a respondent believes that this policy would also raise parents' awareness to monitor their children to be more responsible towards the devices (*ICT 8*).

However, five respondents believe that the effectiveness of applying an acceptable use policy in managing and maintaining the devices would depend on the students' attitude (*ICT 12, ICT 9, ICT 8, ICT 7, and ICT 10*). They believe that while some students would follow the rules, it is likely that a minority of them will show their resistance (*ICT 12, ICT 9, ICT 8, ICT 7, and ICT 10*).

On the other hand, a respondent suggests that rather than applying the acceptable use policy, viable alternative is to apply deposits to loan items (*ICT 6*). The respondent suggests applying deposits as an approach to discourage students from damaging or vandalising the mobile devices.

Another approach which was evaluated by the respondents in managing and maintaining the devices is to apply the loan agreement for loan items. Six respondents agree with this suggestion (*ICT 12, ICT 5, ICT 8, ICT 9, ICT 7, and ICT 11*). However, two respondents believe that students are likely to be less responsible towards loan items, and this might have an impact on the effectiveness of the loan agreement (*ICT 5, ICT 11*). Another respondent suggests that rather than applying loan agreement, it is also possible to apply deposits to loan items (*ICT 6*). The respondent believes that students would value their devices if they contribute towards the devices rather than having the devices at no cost.

Another approach which was evaluated by the respondents is the suggestion to encourage parents' contribution in maintaining the devices. Seven respondents agree with the suggestion and believe that most parents could afford to contribute (*ICT 12, ICT 5, ICT 8, ICT 13, ICT 6, ICT 7, ICT 11*). A respondent suggests that as long as the payment is sensible, it might not be an issue for the parents to contribute (*ICT 11*). However, it might be an issue for the parents with low income to contribute (*ICT 5, ICT 9, ICT 8, and ICT 10*).

Final approach which was evaluated by the respondents is the suggestion to apply device tracking mechanism in dealing with stolen and missing mobile devices. Five respondents agree with the suggestions (*ICT 5, ICT 8, ICT 13, ICT 10, ICT 11*). However, three respondents believe that purchasing the device might not be cost effective and it might be more sensible to replace the devices with new items in the event of faulty (*ICT 6, ICT 12, ICT 9*). A respondent believes that it is appropriate to use device tracking mechanism for the high cost device, but not for the low cost device (*ICT 8*).

## **Evaluation in main field tests: justification of the revision**

The implementation strategy as outlined in “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)” as Appendix B was revised based on the findings from the main field tests. The findings from the main field tests established the consensus with the implementation strategy developed in the study. However, there are some areas which have been improved by the suggestions raised by the respondents. The following were the improvement based on the findings from the main field tests:

1. Six respondents suggest to apply the mobile lessons for enrichment in revising the vocabulary that students learn at school (*English 12, English 5, English 9, English 13, English 7, English 11*). Six respondents also suggest to apply the mobile lessons for preparation; for example in pre-writing (*English 5, English 9, English 13, English 6, English 10, English 11*). These suggestions are included in 1.1 Mobile lessons, page 1.
2. A respondent suggests introducing science, mathematics and technical terminology in the mobile lessons to enrich students' knowledge (*English 12*). This suggestion is included in 1.1 Mobile lessons, page 1.
3. A respondent suggests explaining the meaning of the vocabulary introduced in the mobile lessons in English Language to help students' understanding (*English 6*). Therefore, an explanation was also provided in English Language in addition to Malay Language. This suggestion is included in 1.1 Mobile lessons, page 2.
4. Four respondents suggest to use simple sentences with Malaysian context in the mobile lessons so that the mobile lessons would be suitable for English as a Second Language learner (*English 5, English 10, English 11, English 7*). Therefore, the structure of the mobile lessons is improvised according to this suggestion in 1.1 Mobile lessons, page 2.
5. A respondent suggests introducing root word and family word related to the vocabularies under specific themes in the mobile lessons to enrich students' knowledge (*English 12*). This suggestion is included in 1.1 Mobile lessons, page 3.

6. A respondent suggests developing the mobile lessons into two levels; lower form (Form 1 to Form 3) and upper form (Form 4 to Form 5) and further dividing it into three levels which are beginner, intermediate and advance (*English 13*). The respondent also suggests giving the student the opportunity to choose appropriate levels which suit them. This concurs with the view of Shuler (2009), who highlighted the affordances of mobile phones to support personalisation. These suggestions are included in 1.1 Mobile lessons, page 3.

7. Two respondents suggest including pronunciation mechanism using multimedia element to support students in learning the vocabulary (*English 9, English s 13*). This suggestion is included in 1.1 Mobile lessons, page 3.

8. The schedule to deliver the mobile lessons is also improvised in 1.1 Mobile lessons, page 3. This is based on the suggestion by the English subject leader 13. The suggestion ensures repetitions in vocabulary learning. This concurs with the view of Genesee (2000), who highlighted that repetitive experiences are required in order to learn new words. This suggestion is included in 1.1 Mobile lessons, page 3. The mobile lessons are suggested to be delivered as follows:

- i. On Monday, first six words will be delivered.
- ii. On Wednesday, other six words will be delivered in addition to the six words that have been introduced on Monday.
- iii. On Friday, students will revise all words that they have learned through weekly quizzes.

9. A respondent suggests giving the opportunity to the students to request the mobile lessons to be delivered to them whenever appropriate (*English 13*). This concurs with the view of Shuler (2009), who highlighted the affordances of mobile phones to support personalisation. This suggestion is included in 1.1 Mobile lessons, page 3.

10. A respondent suggests improvising the framework of the facilities to support the implementation (*ICT 5*). The respondent proposes to apply computer servers which

can perform two functions; to receive student answer and to provide feedback. The framework is improvised and is included in 1.2 Resourcing mobile learning, page 5.

11. A respondent suggests applying a specific type of mobile phones which are designed specifically for children and equipped with parental features to help monitor usage and keep costs under control (*Head 8*). This suggestion is included in 1.2 Resourcing mobile learning, page 6. This concurs with the view of Roberson and Hagevik (2008) who suggest the use of a specific type of mobile phones equipped with parental features to address the student's issue.

12. A respondent suggests applying deposits for loan devices so that students would be more responsible towards the loan devices (*ICT 6*). This suggestion is included in 2.1 Ownership model, page 7.

13. A respondent suggests applying Parents Teachers Association fees or student support fund to help students to purchase mobile devices (*ICT 13*). This suggestion is included in 2.1 Ownership model, page 7.

14. Four respondents believe that mobile tracking devices might be cost effective for high cost devices. For low cost devices, the respondents suggest to purchase new mobile phones for replacement (*ICT 6, ICT 12, ICT 9, ICT 8*). This suggestion is included in 2.3 Management and maintenance, page 9.

15. Respondents provide various suggestions to allocate the technical support staff to support the implementation. Six respondents suggest providing additional technical support in utilising mobile learning at schools (*ICT 12, ICT 5, ICT 8, ICT 9, ICT 6, ICT 10*). A respondent suggests to offer the role as technical support as a part time work (*ICT 5*). Another suggestion by the respondents is to use existing technical support at schools (*ICT 12, ICT 8, ICT 13, ICT 7, ICT 10, and ICT 11*). Sharing technical support among schools is also suggested by the respondents (*ICT 12, ICT 8, ICT 13, ICT 6, and ICT 7*). The final suggestion raised by the respondents is to appoint teachers as technical support staff (*ICT subject leader 5, ICT 13*). These suggestions are included in 2.4 Specific roles for supporting mobile learning at school, page 10.

16. In Malaysian secondary schools, students provide assistance to technical support staff in managing and maintaining computer laboratories through students' organisations which are known as Cyber Brigade in Smart Schools and Computer Club in non-Smart Schools (*ICT 12, ICT 8, ICT 13, ICT 6, ICT 7, ICT 10*). This suggestion is parallel to the suggestion in the existing literature about the significance of appointing students as assistance for technical support staff in ICT integration (Pownell and Bailey, 2003; Apple Computer, 2005; Gateway, 2008; Tinker *et al.*, 2007). This suggestion is included in 2.4 Specific roles for supporting mobile learning at school, page 11.

17. A respondent suggests including technical knowledge in parents' briefing sessions; so that the parents would have the knowledge to look for inappropriate content on their children's mobile phones (*Head 5*). This suggestion is included in 2.5 Support for major stakeholders, page 13.

18. Three respondents suggest that mobile learning is suitable to be applied by students in the Malaysian Smart Schools who are familiar with technology (*Head 10, Head 5, ICT 9*). As part of learning institutions which emphasised the use of ICT and familiar with technology (The Malaysian Smart School Blue Print, 1997; The Smart School, 2005), it might be appropriate to introduce mobile learning for Smart School students, who are familiar with the use of technology in education. In addition, three respondents also believe that mobile learning is suitable to be offered as an optional learning tool for non-Smart School students (*Head 6, Head 5, ICT 12*). Finally, five respondents suggest to introduce mobile learning to the students who are interested to utilise mobile phones in learning activities (*ICT 12, Head 10, Head 6, Head 5, ICT 9*). These suggestions are included in Introduction, page iii.

There are some suggestions which were not implemented. The following note the suggestions which were not applied in the implementation strategy.

1. There are various suggestions from the respondents regarding the number of the words which should be introduced in the mobile lessons. A respondent proposed to deliver 3 words to the weak student and to deliver 5 or 6 words to good students

(*English 5*). She also suggests delivering the mobile lessons twice a week rather than three times a week. Another respondent believes that sending 6 words each time the mobile lessons are delivered might be overwhelming and suggests limiting to 3 or 4 words (*English 6*). Another respondent suggests delivering 10 words each time because the respondent believes that it is a good round number and could enhance the grading process (*English 9*). However, these suggestions are not applied. The suggestion as proposed by the English subject leader 13 to ensure repetitions in vocabulary learning was followed. This concurs with the view of Genesee (2000), who highlighted that repetitive experiences are required in order to learn new words. This suggestion is included in 1.1 Mobile lessons, page 3.

The following table summarises the findings which contribute towards the revision of the implementation strategy. The tables indicate the revisions in the aspects of structure, content, policy and procedure and aspect of practice through main field tests which were previously discussed in Evaluation in main field tests: justification of the revision. The aspect of structure refers to the revision in the proposed structure of the mobile lessons, while the aspect of content refers to the revision in the proposed content of the mobile lessons. Regarding the aspect of policy and procedure, it covers the revision of the suggestion in the management of mobile learning. The aspect of practice covers the management approach in mobile learning which have direct implication on students. Revisions are made either from the respondent's perspective or by the combination of the respondent's perspective and literature.

	<b>Change type</b>	<b>Source of data in main field tests</b>	<b>Reference in implementation strategy (Main field tests) as Appendix B</b>	<b>Research question</b>
1.	Structure	Respondent	1.1 Mobile lessons, page 1	1.2
2.	Content	Respondent	1.1 Mobile lessons, page 1	1.2
3.	Content	Respondent	1.1 Mobile lessons, page 2	1.2
4.	Structure	Respondent	1.1 Mobile lessons, page 2	1.2
5.	Content	Respondent	1.1 Mobile lessons, page 3	1.2
6.	Structure	Respondent and literature	1.1 Mobile lessons, page 3	1.2
7.	Structure	Respondent	1.1 Mobile lessons, page 3	1.2
8.	Structure	Respondent and literature	1.1 Mobile lessons, page 3	1.4
9.	Structure	Respondent and literature	1.1 Mobile lessons, page 3	1.3
10.	Structure	Respondent	1.2 Resourcing mobile learning, page 5	Additional strategy
11.	Practice	Respondent and literature	1.2 Resourcing mobile learning, Page 6	Additional strategy
12.	Practice	Respondent	2.1 Ownership model, page 7	1.11
13.	Practice	Respondent	2.1 Ownership model, page 7	1.11
14.	Policy and procedure	Respondent	2.3 Management and maintenance, page 9	1.12
15.	Policy and procedure	Respondent	2.4 Specific roles for supporting mobile learning at school, page 10	1.8
16.	Practice	Respondent and literature	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
17.	Practice	Respondent	2.5 Support for major stakeholders, page 13	1.7
18.	Practice	Respondent and literature	Introduction, page iii	Additional strategy

**Table 12: Summary of the findings in main field tests in the indication of the contribution in the revision of the implementation strategy**

## Summary

This section discusses the revision of the implementation strategy which was documented in a handbook called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)”

as Appendix B. The revisions are based on the findings from the main field tests, conducted in nine schools in Malaysia.

The findings in the main field tests established the strategy to implement mobile learning via mobile phones in Malaysian secondary schools. To support the English vocabulary acquisition in Malaysian schools, the mobile lessons are projected to be delivered through Short Message Service (SMS), which consists of vocabulary introduction and explanation, vocabulary review through multiple-choice questions and feedback mechanism. It is also worthwhile to include multimedia elements in the mobile lessons.

In integrating the mobile lesson to the existing curriculum, the mobile lessons are formulated to be integrated into learning activities at schools such as listening, speaking, reading and writing. The mobile lessons are projected to conform to the syllabus provided by the Ministry of Education, Malaysia. Science, mathematics and technical terminology as well as root word and family word associated with the vocabulary are also projected to be introduced. The mobile lessons are also projected to be used as a supplement to support teaching and learning; for enrichment and preparation. The mobile lessons are projected to be divided into two levels; lower form (Form 1 to Form 3) and upper form (Form 4 to Form 5). It will be further divided into three levels which are beginner, intermediate and advance. Students will have the opportunity to choose appropriate level which suits them.

To fit in with the students' daily activities, the mobile lessons are formulated to be delivered during out-of-school hours and during school holidays; every Monday, Wednesday and Friday. Students who attend the school during morning session will receive the mobile lessons in the evening while students who attend the school during afternoon session will receive the mobile lessons in the morning. Another viable approach which was established is allowing students to request the mobile lessons to be delivered whenever appropriate.

To ensure that the students would be able to master the mobile lessons efficiently, the delivery schedule is established. The mobile lessons are projected to be delivered according to the following schedule: (i) on Monday, first six words will be

delivered, (ii) on Wednesday, another six words will be delivered together with the previous words that have been delivered on Monday, and (iii) on Friday, and students are scheduled to review the words that they have learned through weekly quizzes.

It is also important to formulate the strategies to prepare teachers with the proper attitude, sufficient knowledge and skills for the implementation. It has been established in the main field tests that training is important for teachers to ensure that they would be well informed regarding the benefits and objectives of the implementation, as well as to be provided with hands-on professional learning which is essential in implementing mobile learning. Awareness about the safety, security and ethical issues surrounding the use of mobile devices in education are also important to enable the teachers to apply that knowledge in practice. In addition, it has also been established that teachers need to be provided with on-going support, sufficient time to explore the devices and to be encouraged to contribute in the pilot project to initiate a sense of ownership. Partnership with local universities, education organisations and other institutions are also encouraged so that schools will be able to gain expertise and support for training purpose.

It is also important to conduct induction sessions so that students can explore issues associated with mobile learning utilisation; the benefits and objectives, knowledge and skills required in the implementation. Awareness about the safety, security and ethical issues surrounding the use of mobile phones in education are also important to enable the students to apply the knowledge in practice. On-going support is also important to foster motivation throughout the implementation.

The main field tests also established the importance of the student's voice, which would provide the opportunity for the students to explain to the teachers regarding their interest to use latest technology in learning activities such as mobile phones. This would help to raise positive attitude among teachers about the implementation. Another approach in supporting the students in the implementation is to encourage students to contribute in the pilot project to initiate a sense of ownership.

The importance of support for parents is also established. There are possible ways to ensure that parents are well-informed about the implementation which would eventually foster parents' support. They can be informed through support documents or letters, school websites and special events such as information day, parents' evening, weekend meeting, Parents Teachers Association meeting, or school open day. Briefing sessions are also important to disseminate important information such as the benefits and objectives of the implementation, parents' role in the implementation, as well policies and procedures. Other important issues for parents' awareness are safety, security and ethical issues surrounding the use of mobile devices to support them in monitoring their children to use mobile devices productively. It is also worthwhile to include technical knowledge in the briefing sessions to help parents monitor their children. Parents should also receive information about their children's progress from time to time. Finally, to foster parents' support, parents should also be assured that there will be minimal expenses in the implementation.

The main field tests also established that to support the implementation, there is a need to assume or assign specific roles, namely the English language subject leader, technical support staff (help desk) and students as a maintenance assistant to help the technical support staff (help desk). The role of an English language subject leader is to coordinate the implementation of mobile learning in the English language subject and to provide on-going support to English language teachers in the implementation. There are four possible ways to allocate technical support staff at schools. These are as the following: (1) allocating additional technical support staff; (2) using existing technical support staff; (3) sharing technical support staff between schools; and (4) appointing teachers as technical support staff. Their roles will include: (1) to perform comprehensive management and maintenance of all facilities in the implementation; (2) to gather knowledge about the technology in the implementation; and (3) to provide on-going support to teachers and students. Moreover, it is also possible to appoint students as maintenance assistant. With training, students are capable to provide assistance for technical support staff. Students can be selected from the computer clubs at non-Smart Schools and from the cyber brigades at Smart Schools among the students who are interested in the field of ICT.

With regard to eliminating the negative implications for students in using mobile phones in education, the main field tests established that there are two possible solutions. The first approach is through induction sessions. Through induction sessions, students will have the awareness of safety, security and ethical issues surrounding the use of mobile phones in education which would help to address the issue of the negative implications on students. Another sensible approach is through the Acceptable Use Policy (AUP). With the Acceptable Use Policy (AUP), students will be guided by rules to prevent issues associated with intentional and unintentional misuse of mobile technologies. Finally, it is also worthwhile to safeguard students with practical countermeasures in addressing the issues of cyber bullying.

With regard to the funding, the key strategy is to gain contribution from the government. However, it might be appropriate to encourage private companies such as mobile phone manufacturer and mobile network provider to contribute towards the implementation by providing easy-payment schemes. The government might also consider collaborating with content developers by offering incentives for their contributions. In addition to local companies, collaboration with local universities in developing the content should also be encouraged. The use of open source software might also be considered.

Two schemes to support students to acquire mobile phones are also established. These are known as Purchase Scheme and Loan Scheme. For Purchase Scheme, parents are encouraged to contribute towards the cost of the devices so that students will have the full ownership. The total cost of the mobile phones will be spread over five years, which is for the whole duration of secondary school education in Malaysia (from Form 1 to Form 5). With regard to the Loan Scheme, this model is formulated specifically for students who could not afford to purchase the devices. The parents and students are required to comply with the Loan Scheme Agreement which is to take proper care of the devices. Instead of Loan Scheme Agreement, the main field tests also established another viable approach by asking for some deposits for the loan devices. At the end of the year, deposits will be returned if there is no damage. In addition, for students who come from low-income family, it is also reasonable to use Parents Teachers Association fees or

student support fund to purchase mobile phones. Another alternative is to use students' own devices.

It is also important to develop and establish procedures in order to manage and maintain the devices in the implementation. Possible procedures are applying serial number or identification code and password to the devices, keeping a systematic inventory of the devices, providing protective case, applying mobile theft solution, providing temporary supplies or loan stocks to students while waiting for the devices to be repaired and purchasing insurance or additional warranty coverage. It is also useful to apply an acceptable use policy to sanction students who steal other people's devices as well as damaging and vandalising the devices. Another approach is to utilise basic mobile phones to make them less attractive to thieves. This would also address the issue of insurance fraud because it would refrain the students from deliberately lose the mobile phones with the intention to claim the money. Moreover, it is also useful to raise student awareness through induction sessions to have a responsibility towards the devices. Finally, it is also beneficial to provide an opportunity to the students to customise their devices. This is to boost a sense of ownership which will eventually raise students' responsibility towards the devices.

Additional solutions were also established in the main field tests besides the approaches which have been highlighted in the implementation strategy. The study established that mobile learning is suitable to be introduced for Smart School students, who are familiar with the use of technology in education. For non-Smart School students, it might be appropriate to be offered as an optional learning tool and for students who are interested to deploy mobile learning. A specific type of mobile phones equipped with parental feature is also suggested to be used to address the issue of negative implication on students.

The findings from the main field tests described throughout this section provide valuable information that effectively shaped the revised version of the implementation strategy. The main field tests provide much insight into the strengths and weaknesses of the implementation strategy. However, there is a tension in determining the suggestions that are selected in the revised version of

the implementation strategy. While some of the justifications are based on the literature, some of the justifications are based purely on the practicality of the suggestions.

Regardless of the challenges in revising the implementation strategy, a new version of the implementation strategy is developed. The new version of the implementation strategy is called “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Dissemination and Distribution Stage)”. This version is included as Appendix C. This version is disseminated and distributed to the officers in the Ministry Of Education, Malaysia in the final stage of this study. As well as disseminating and distributing the implementation strategy, the final stage of the study also explores the respondents’ perspectives regarding the potential of mobile phones to complement the existing practices in Malaysian schools and other emerging issues. The next section continues with the findings from the final stage of the study.

## Dissemination and distribution of the implementation strategy

In the study, dissemination and distribution is the final stage of the Educational Research and Development (ER&D) approach. The strategy to implement mobile learning in Malaysian schools as Appendix C was disseminated and distributed to the officers in the Ministry of Education, Malaysia. The respondents' perspectives about the potential of utilising mobile phones to complement the existing practices in Malaysian schools were explored. Interview schedules were developed according to the following research question:

### How can mobile learning complement the existing practices in Malaysian secondary schools?

To answer the research question, four concepts are explored which are ICT policy, Malaysian Smart School's vision, English Language subject support and alternative technology. These concepts become the basis of the research sub-questions:

Research Question 2: How can mobile learning complement the existing practices in Malaysian secondary schools?			
 English Language subject support	 Malaysian school's ICT policy	 Malaysian Smart School's vision	 Alternative teaching and learning
2.1 How can mobile learning add value to the existing initiatives in Malaysian schools in improving students command in English Language subject?	2.2 How can mobile learning complement the policy in Malaysian Educational System to deploy ICT?	2.3 How can mobile learning complement the Malaysian Smart School's vision to deploy mobile technologies?	2.4 How can mobile learning become an alternative teaching and learning tool?

Figure 31: Research question 2 and the sub-questions

In addition, the opinion related to the implementation strategy which was developed in this study was also explored. Emerging issues in implementing mobile learning in Malaysian schools were also established. The following sub-sections present the findings explored in the dissemination and distribution:

## **2.1 How can mobile learning add value to the existing initiatives in improving students command in the English Language subject?**

The sub-question explores the potential of utilising mobile phones to add value in improving students' command in English Language. When asked about the potential of utilising mobile phones to add value in English Language learning, all respondents are positive (*Officer 1, Officer 2, Officer 3, Officer 4, Officer 5*).

The first respondent believes that pedagogically, mobile phones have the potential to support English Language learning in Malaysian schools:

*“From an educational perspective, pedagogically, we can see the strength of mobile phones. We can see the advantages that mobile phones will bring in teaching and learning English Language.”* (Officer 1)

The second respondent suggests applying multimedia elements such as games, graphic and animation in the mobile lessons so that the English language learning would be engaging. The respondent believes that this would eventually support the English Language subject and illustrate the suggestion by taking an example from the mobile lessons that were established in the study. Below is an excerpt from the interview transcription between the researcher and the respondent:

*Officer 2: OK, envy is an emotion, isn't it? So, how do you portray emotion in multimedia form?*

*Researcher: To include a picture in explaining a scenario?*

*Officer 2: Yes. Include an animation of angry, sadness, happiness and joy. This is the easiest other than text. For higher level, maybe you can include graphic and animation. For the highest level, of course it will be the games.*

The third respondent believes that the element of multimedia in mobile phones plays a significant role to support English Language learning. The respondent explains how children use video games to learn English Language:

*“My sons, in Form 2 and in Form 3, they like to play video games. But, when the English Language result came out, they managed to get A, actually they learn through video games. Students are weak in English Language because they do not have the opportunities to use English Language, but they can practise through games. .... I think what you are doing is good to help students in English Language.” (Officer 3)*

The response from the fourth respondent is also promising and highlights the affordances of mobile phones for English Language learning which support mobility and collaboration. The respondent also reports that mobile phones will be used in “Strengthening Malay Language, Enhancing English Language” programme. The respondent also stated that a division of the Ministry of Education, Malaysia is working on developing the framework and concepts to use mobile phones to support English Language learning:

*“Previously the government has introduced “English for Teaching Maths and Science” programme to enhance students' command in English Language. From now on, it will be changed into “Strengthening Malay Language, Enhancing English Language” programme. Mobile learning through mobile phones will be the next technology to be introduced. With the support from any organisations, it has the prospect to be introduced in the future.” (Officer 4)*

For the final respondent, there are possibilities that the use of mobile phones will help students in learning English. These are based on several factors: motivation, engagement and mobility. The following is a comment based on the respondent’s thesis findings:

*“Yes, I believe it can because it is something new, something different. The students should pick it up very easily. It is something easy and new for the students to use. In addition to it, the students are able to access their mobile phones anytime, that’s mean when they’re on the bus, going somewhere. Like when I did my research, when they’re on school holiday, I could also contact them”. (Officer 5)*

The respondent added:

*“Some of the students, it is not the push, they did it because it is something new and they enjoyed being challenged because you give them questions and they wanted to do well on the questions. So, in that sense I got a lot of positive feedback, some of them said it was fun, they wish their teacher would do this for the normal lessons. So, I believe if you use text messaging, it would be fun for them.”* (Officer 5)

## **2.2 How can mobile learning complement the policy in the Malaysian Educational System to deploy ICT?**

When asked regarding the potential of utilising mobile phones to complement the policy in the Malaysian Educational System to deploy ICT, all respondents provide positive responses (*Officer 1, Officer 2, Officer 3, Officer 4, Officer 5*).

The first respondent implies:

*“I think it is one of the viable learning tools. And mobile phones will bring many advantages for the purpose, if it is used in the right way”.* (Officer 1)

In addition to other ICT devices such as desktop computer, laptop, iPad and iPod, the second respondent propose to utilise mobile phones to access the existing Learning and Management Systems (LMS) in Malaysian schools. The respondent predicts that this will happen within 10 years. However, the respondent highlights the challenges that need to be addressed to implement mobile learning which include management and maintenance, monitoring and stakeholders' readiness.

Based on the educational ICT policy in Malaysian schools which encourage the use of ICT in education, the third respondent was also positive and believes that the deployment of mobile learning would have the potential to complement the policy in the Malaysian Educational System.

The fourth respondent also agrees with the potential of mobile learning to complement the ICT policy. However, the respondent is inclined to introduce mobile

phones for upper secondary school students, aged 16 to 17 years old. The respondent believes that the upper secondary school students might be more responsible and wiser to use mobile phones to support their learning activities (Officer 4).

The final respondent revisits the Malaysian ICT policy and highlights the importance to embrace ICT in supporting teaching and learning. The respondent stresses that mobile phones should have a place in education as it is also under the umbrella of ICT:

*“For teaching and learning, I believe yes, it can be used because it’s just like a computer. In fact, mobile phone nowadays is a mini computer. So, if a computer can be used for teaching and learning, as a communication device for information, then mobile phone is the same thing. You can get information; can communicate with it; to what level is depending on the capability of that device.”* (Officer 5)

### **2.3 How can mobile learning complement the Malaysian Smart School vision to deploy mobile technologies?**

With regard to the potential of utilising mobile phones to complement the Malaysian Smart School’s vision to deploy mobile technologies, all respondents provide a positive response (*Officer 1, Officer 2, Officer 3, Officer 4, Officer 5*).

The first respondent believes that mobile phone is a sensible alternative which can be used in the Malaysian Smart School for teaching and learning. Below is an excerpt from the interview:

*“Sure. It can. Like what I said previously, it is another chalk. We can use mobile phones, smart phones, iPad, iPhone, everything which is sensible can be used.”* (Officer 1)

The second respondent refers to the Malaysian Smart School vision which stated that technology is an enabler and driving force towards the integration of ICT in teaching and learning. The respondent believes that there is a potential to use

mobile phones in Malaysian Smart Schools, because these schools are the pioneers in ICT integration and was positive that the students in the Malaysian Smart Schools are suitable to use mobile phones to support learning. The respondent also reports that there is a plan to conduct a study in Malaysian Smart Schools to develop e-content where mobile phones will be one of the ICT devices which are proposed to be used to access the content.

The third respondent also agrees with the potential of mobile phones to be used in the Malaysian Smart Schools. However, the respondent believes that there might be a challenge for students to acquire sophisticated mobile phones or smart phones because of the price issue.

The fourth respondent is enthusiastic to deploy mobile phones to support Malaysian Smart School's vision. The following statement shows the opinion:

*"I am sure it will. With the current situation in Malaysian Smart Schools, mobile phones such as smart phones will help. I am positive that it will. If we say about Malaysian Smart Schools, we can imagine that these schools are in an electronic environment."*(Officer 4)

The last respondent stresses the responsibility of the Malaysian Smart Schools to prepare students for the 21<sup>st</sup> century to become knowledgeable and skilful workers. The respondent believes that mobile phones can be used and should be used in the Malaysian Smart Schools to help achieving this vision:

*"So whatever technology that is available at the moment can be used and in fact, it should be used. The most recent technology should be used, because technology is changing very fast. Previously there are desktop computers, now more mobile laptops being used and in fact mobile phones are coming in. We should take advantage of what technology is available and use it for teaching and learning. So, yes, I believe that we should prepare our students for the outside world, we should use available technology like mobile phones."* (IOfficer 5)

## **2.4 How can mobile learning become an alternative teaching and learning tool?**

Five respondents were asked about the possibility of utilising mobile phones as an alternative teaching and learning tool in Malaysian schools. All respondents provide positive responses (*Officer 1, Officer 2, Officer 3, Officer 4, and Officer 5*).

The first respondent believes that mobile phones are another mode of learning. The respondent illustrates the use of mobile phones as a metaphor of a chalk. The respondent believes that technology will help to extend learning outside the classroom. Below is an excerpt from the interview:

*“It is a good tool. It can be one of the many tools for learning. Basically, it’s another version of a chalk. Previously, learning is actually constraint to the classroom. With technology, we’re opening up the classroom; the whole world is the classroom.”*  
(Officer 1)

The second respondent highlights the affordances of mobile phones as an alternative tool. These include; supporting mobility, supporting communication between teachers and students as well as supporting learning activities outside school hour (*Officer 2*).

The third respondent is also positive and suggests enforcing rules to guide students in using mobile phones productively in their learning activities and to address the issue of misuse (*Officer 3*).

The fourth respondent reports that the Ministry of Education, Malaysia had proposed to use mobile phones in enhancing teaching and learning. The respondent further states that, any technology which has the potential to support teaching and learning is always welcomed, including mobile phones:

*“I believe it will happen in the future. Although it is being prohibited at the moment, it will have the prospect to be used in the future. It will support teaching and learning activities. That is the reason why I support the use of this technology.”*  
(Officer 4)

The final respondent is also positive and can see the potential of using mobile phones in education because of the proliferation of mobile phones:

*“ I mean, it’s already there, the students are using it, and you don’t need to train them to use it, not like a computer, where they need a little bit of training. So, it’s something easily available, take the opportunity and use it”. (Officer 5)*

Parallel to the statement by the fourth respondent, the final respondent also reports that a division in the Ministry of Education, Malaysia has a plan in launching a project to use mobile phones to support mainstream schooling. The respondent reports that the Ministry of Education, Malaysia has been involved in the technology integration using tablet PC and netbook. Mobile phones are the latest technology which is projected to be used.

### **Overall opinion about the implementation strategy**

At the end of the data collection, the respondents also provide their opinion about the implementation strategy as Appendix C which has been established in this study. All respondents are positive about the implementation strategy (*Officer 1, Officer 2, Officer 3, Officer 4, and Officer 5*).

The first respondent believes that theoretically, the implementation strategy could support the mobile learning implementation in Malaysian schools. However, the respondent also believes that practically, the challenges might arise. The respondent also suggests including more technical details in the implementation strategy in the future.

The second respondent suggests that in the future it would be useful to conduct a research in Malaysian schools to use the implementation strategy to obtain further outcomes. The respondent also suggests adding comprehensive technical details in the implementation strategy in the future.

The third respondent reports that mobile learning via mobile phones has been suggested by a division in the Ministry of Education, Malaysia. Therefore, the

respondent believes that the implementation strategy has the potential to be disseminated to the higher management in the Ministry of Education, Malaysia:

*“The implementation strategy has the potential to be disseminated to the higher management in the ministry. Mobile learning has been promoted by our division and therefore this document has its potential.”* (Officer 3)

The fourth respondent also indicates positive response and optimistic that with the help of private companies, educational institutions or individuals, the implementation strategy can be used as guidance to implement mobile learning in Malaysian schools in the future.

The final respondent was also positive with the potential of the implementation strategy to provide guidance for the implementation of mobile learning:

*“There’s a possibility that we’ll refer to it. Actually it is good because you’re studying at the policy level. So, you’re looking at the teachers on how they’re going to implement and use it. So, it will be quite useful for us to see at that level. Because we have much research on the implementation but at the higher level, policy level; on how to use and manage learning, there’s a lack of research, on the management of it. To look at the processes behind the implementation, the policy that needs to be in place. I think there’s a lot of things need to be looked at..... That’s right, because you are looking at the government; how to provide the mobile phones, how to design it specifically for students, whether to put it as hire or purchase. Those are the things we can look at, which have not been looked at yet.”* (Officer 5)

The respondent also agrees with the content of the implementation strategy:

*“And I agree with your mobile lesson, there is a need to conform to the syllabus but it can easily be matched with the syllabus. Text messaging should not be a problem because we have to give questions in chunks, so it is very easy to isolate parts of the syllabus and break it up into small components. It can be quite easily done through quizzes and questions”.* (Officer 5)

## Summary

In the final stage of the study, the implementation strategy as Appendix C is disseminated and distributed to the officers in the Ministry of Education, Malaysia. In addition, the officers' perspectives about the potential of implementing mobile learning to complement the existing practices in Malaysian schools are explored.

This section explores the feasibility to implement mobile learning in complementing the existing practices in Malaysian secondary school. Four concepts are identified to explore the issue. These are ICT policy, Malaysian Smart School's vision, English Language subject support and alternative technology. The first concept addresses the prospect to use mobile phones as an alternative teaching and learning tool. All respondents provide positive response. The first respondent is positive that mobile phones have the potential to be another mode of learning which would extend learning outside school hours while the second respondent justifies the opinion by highlighting the benefits of using mobile phones in education. The third respondent was positive with the affordance of mobile phones as an alternative tool, but stresses that monitoring is essential to address the issue of misuse. The fourth and final respondents also identify the prospects of using mobile phones as another mode of learning and report that mobile phones are projected to be explored in a division in the Ministry of Education, Malaysia in the next ICT project. The final respondents also believe that the proliferation of mobile phones in Malaysia contributes towards the potential to utilise mobile phones as another mode of learning in Malaysian schools.

The potential of utilising mobile phones to add value in the existing initiatives to enhance English Language learning was also explored. The first respondent believes that pedagogically, mobile phones have the potential to support English Language learning in Malaysian schools. The second and third respondents are also positive and suggest embracing mobile phones in supporting English Language subject. The use of multimedia elements such as games, graphic and animations are recommended. The fourth respondent supports the affordances of mobile phones for English Language through its mobility and collaborative value. The respondent also reports that mobile phones will be used in a project to support

“Strengthening Malay Language, Enhancing English Language” programme in Malaysian schools. Similar to other respondents, the final respondent is also positive with the potential of mobile phones as an engaging and motivational tool as well as supporting mobility in English Language learning.

The potential of utilising mobile phones to complement the ICT policy in the Malaysian Educational System was also explored. The first respondent is positive that mobile phone is another mode of learning which could support the policy if it is used appropriately. The second respondent comments that in addition to other ICT devices, mobile phones can be used to access the Learning and Management System in Malaysian schools in the future. Based on the educational ICT policy in Malaysian schools which encourage the use of ICT in education, the third respondent was also positive and believes that the deployment of mobile learning would have the potential to complement the policy in the Malaysian Educational System. The fourth respondent also agreed but inclined to introduce mobile phones for upper secondary school students, who would be more responsible and wiser in deploying mobile phones. The final respondent stresses that mobile phones should be used in mainstream schooling as it is also an ICT device.

The final concept in the research question explores the potential of utilising mobile phones to complement the Malaysian Smart School’s vision to deploy mobile technologies. The first respondent believes that mobile phone is another type of mobile device which is appropriate to be used in the Malaysian Smart School. The second respondent also has the same opinion and explains that as the pioneer in ICT integration in teaching and learning, Malaysian Smart Schools’ students are suitable to use mobile phones in educational activities. The respondent also reports that there is a plan to conduct a study in Malaysian Smart Schools where mobile phones will be one of the ICT devices to be used to access e-content. The third respondent is also positive, but has a concern regarding the challenge to acquire mobile phones because of the cost issue. The fourth respondent is also positive as the respondent believes that the use of mobile phones will add value in complementing the Malaysian Smart School’s vision because these schools support the use of ICT in teaching and learning. The final respondent believes that the use of mobile phones will help the Malaysian Smart Schools to prepare

students with digital literacy. This would eventually prepare the students to become skilful workers for the 21<sup>st</sup> century.

At the end of the data collection, the respondents also provide their opinion about the implementation strategy. All respondents are positive. The first respondent believes that theoretically, the implementation strategy would help in implementing mobile learning, although it might not happen without challenges. The first and second respondents believe that in the future it might be useful to include comprehensive technical details in the implementation strategy. The second respondent also suggests that in the future, it might be worthwhile to conduct a study to utilise the implementation strategy in Malaysian schools to gather further outcome. For the third respondent, the implementation strategy has the potential to be disseminated to the higher management in the Ministry of Education, Malaysia because previously there was a suggestion by the division to deploy mobile technology in schools. The fourth respondent also provides positive response and was optimistic that the implementation strategy can be used as guidance to implement mobile learning in Malaysian schools in the future. The response from the final respondent is also promising and points out that the implementation strategy has filled the research gap where there is a lack of research on the policy level and the management of mobile learning implementation. Therefore, the respondent agrees that there is a possibility that the implementation strategy will provide guidance in the implementation of mobile learning in Malaysia.

In addition to the positive response, the respondents also highlight the challenges that need to be addressed to utilise mobile phones in Malaysian schools. The findings are gathered together with the opinion of the previous respondents in the preliminary field tests and the main field tests. The findings are described in the next section, Emerging themes in the implementation of mobile learning.

## Emerging themes in the implementation of mobile learning

This section discusses the emerging themes established in this study. The perspectives were established from the English subject leaders, ICT subject leaders, head teachers and deputy head teachers from the schools in the United Kingdom and Malaysia, as well as from the officers in the Ministry of Education, Malaysia. The data analysis established that the emerging themes are grouped under two main themes. These are opportunities and challenges to implement mobile learning in Malaysian schools. The opportunities to implement mobile learning are based on the following key points: as a teaching and learning tool to support English subject, as a common device among students, as a future teaching and learning tool, as a tool to support various learning activities, as an affordable tool, as an engaging and motivational tool and as a tool to prepare students with digital literacy for their future. These are represented in the next figure.

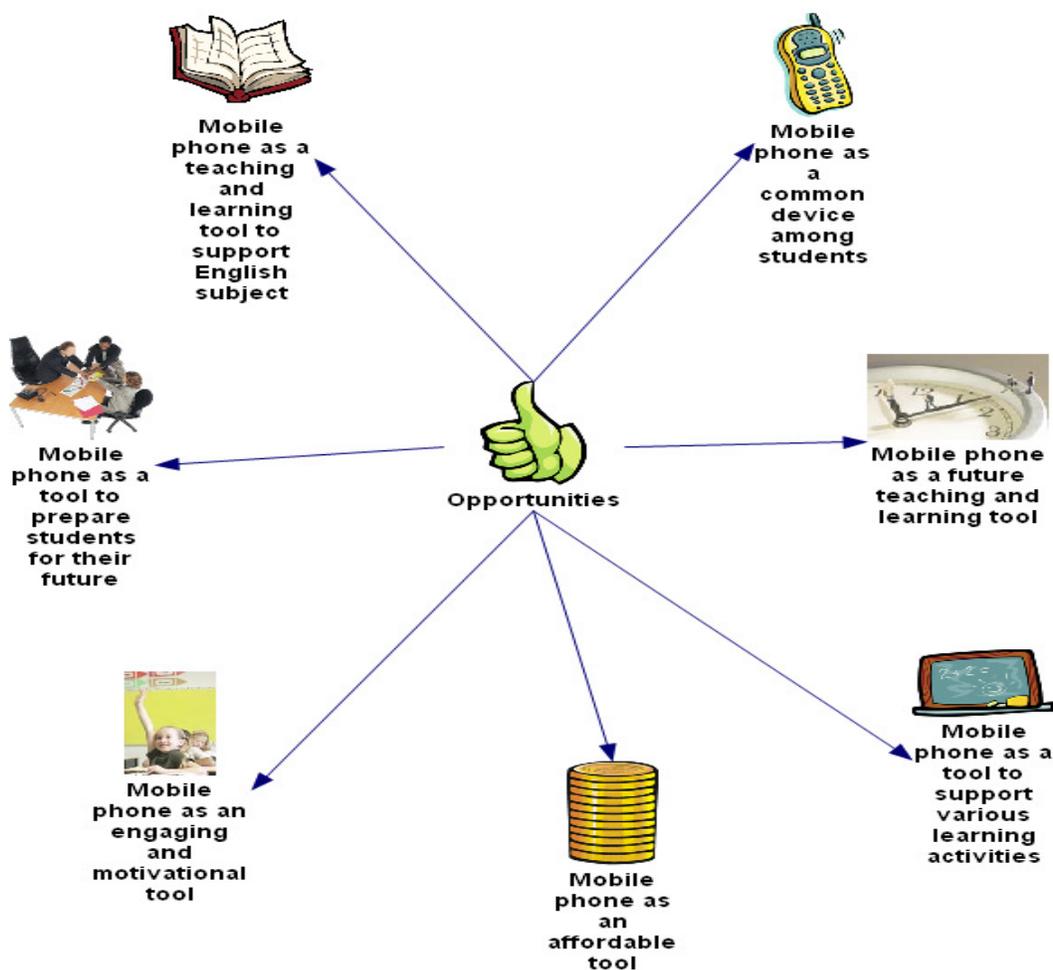


Figure 32: Opportunities to implement mobile learning in Malaysian schools

With regard to the challenges to implement mobile learning, these are based on the following key points: misuse, current educational policy, management and maintenance, stakeholders' attitude, digital divide and personal space invasion. These are represented in the next figure.

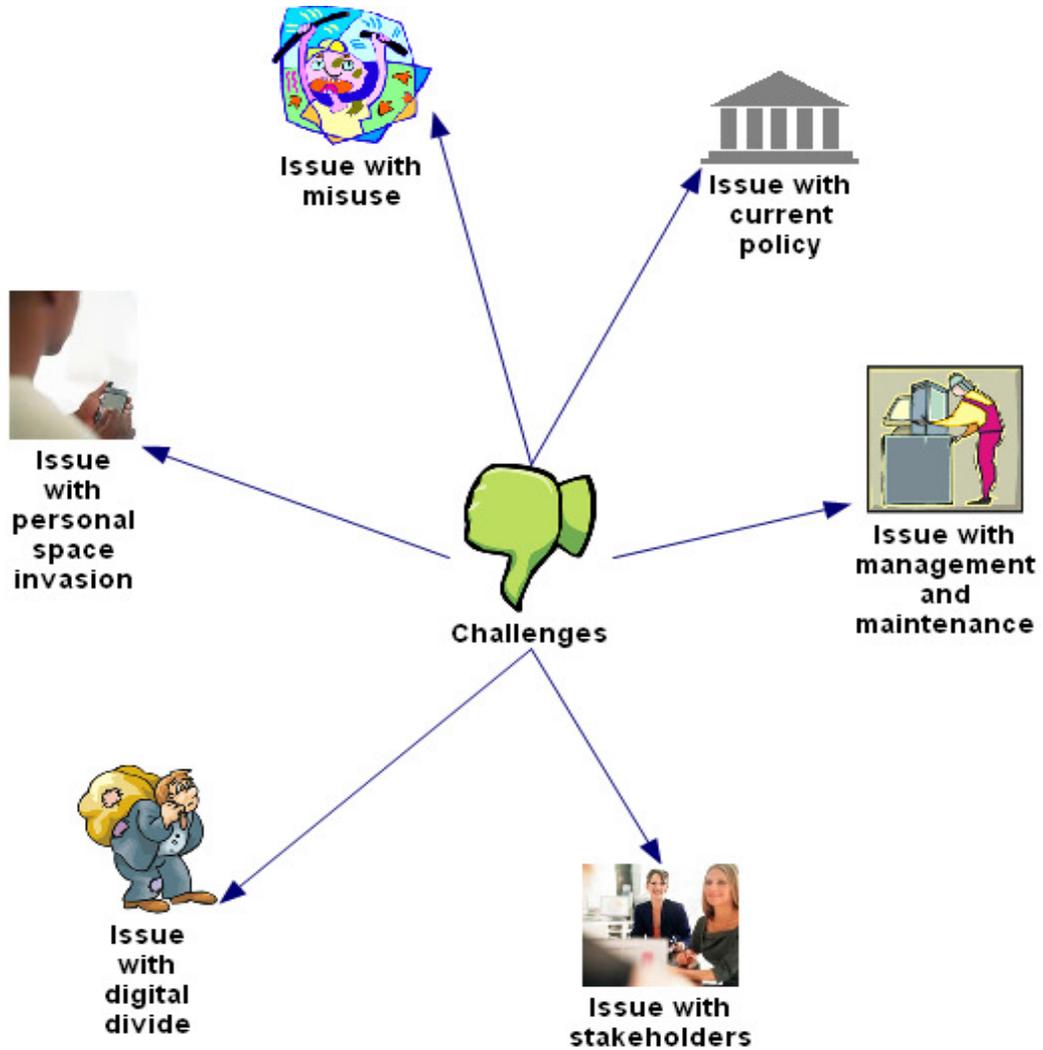


Figure 33: Challenges to implement mobile learning in Malaysian schools

## Emerging themes: opportunities

Findings from the field tests established the opportunities to implement mobile learning in Malaysian schools. The following sub-sections discuss the opportunities.

Theme 1: Mobile phones as a teaching and learning tool to support English subject
Theme 2: Mobile phones as a common device among students
Theme 3: Mobile phones as a future teaching and learning tool
Theme 4: Mobile phones as a tool to support various learning activities
Theme 5: Mobile phones as an affordable tool
Theme 6: Mobile phones as an engaging and motivational tool
Theme 7: Mobile phones as a tool to prepare students for their future

### **Theme 1: Mobile phones as a teaching and learning tool to support English subject**

Interviews established that the respondents from the United Kingdom and Malaysia are positive towards the possibility of using mobile phones in supporting English subject. Three respondents made this clear in the interviews and highlight that mobile phones could bring added value to support English Language subject in Malaysian schools (*Head 5 from Malaysia, Head 8 from Malaysia and Head 11 from Malaysia*). Below is the interview excerpt with one of the respondents:

*“I believe this programme could be implemented in school; it could enhance students’ achievement in English Language and could lead to academic performance. It could be an alternative to improve English Language.”* (Head 5 from Malaysia)

Two respondents suggest proposing the use of mobile phones for educational purpose to the Ministry of Education, Malaysia (*Head 13 from Malaysia and ICT 5 from Malaysia*).

A respondent relates the mobile lessons established in the study of the existing practices in teaching vocabulary at the school where every day a new vocabulary in Malay Language, English Language and Arabic is announced through the public announcement system and they conduct quizzes every week during the assembly (*English 12 from Malaysia*). The respondent believes that the use of mobile lessons could be an effective way as an alternative to the existing approach to acquire vocabulary at the school (*English 12 from Malaysia*).

The respondents in the United Kingdom and Malaysia recognise the pedagogical affordances of mobile phones in English Language learning. A respondent believes that mobile lessons could help students in learning English as a second language. The respondent also believes that it is unusual for students to receive personal attention in the classroom. This is where mobile lessons could supplement English learning, as this respondent's comment demonstrates:

*"When you are learning a second language, the things like introducing vocabulary, pronunciation, is really good, is really good, because obviously the students certainly almost have got personal attention, don't they? They will be able to practice and do things like that and individually, whereas through activity like that, they don't get the opportunity to do things like that in the classroom."* (English 1 from United Kingdom)

The respondent also believes that through the use of SMS technology, it could provide an interactive environment in learning English (*English 1 from the United Kingdom*). Another respondent was also positive that mobile learning could help students in improving English language proficiency through drill and practice (Officer 5 from Malaysia).

Another respondent was confident about the potential of using mobile phones as an effective tool to learn vocabulary (*English 8 from Malaysia*). The respondent

believes that students are generally weak in vocabulary because they are not interested to read to acquire vocabulary. Mobile lessons could address this problem by providing the opportunity for the students to acquire vocabularies systematically.

Another respondent highlights that mobile lessons could boost students' confidence in learning English (*English 9 from Malaysia*). The respondent believes that it is a common issue for the students to be intimidated in using English Language because students are afraid of making mistakes. Mobile lessons could help to address this problem by giving the opportunity to students to practice their language skills within their own pace and without feeling taken aback.

Mobile lessons were also perceived as a tool which provides an opportunity for the students to become autonomous learners in learning English. In the following example, a respondent justifies the potential:

*"But this one, I think is a plus, student progress tracking system, because the teachers do not have to do the clerical work, this is already made available to the teachers, and the vocabulary also made available to the students, so students can increase their vocabulary list without referring to the teacher, which is good, I like it. I wish we have it now."* (English 9 from Malaysia)

## **Theme 2: Mobile phone as a common device among students**

The analysis indicates that the proliferation of mobile phones contributes to the potential to implement mobile learning. Eight respondents agree that mobile phones is a common tool owned by almost everyone and most students could afford to own the device (*Head 12 from Malaysia, Head 5 from Malaysia, Head 8 from Malaysia, Head 9 from Malaysia, Head 13 from Malaysia, Head 6 from Malaysia, Head 10 from Malaysia, Head 11 from Malaysia*).

A respondent stresses that there is a need to harness the proliferation of mobile phones to support students in their learning activities:

*“There’s a lot of potential which we have to have, to make harness. Otherwise, it is a waste of technology which is so easily available to so many people we don’t make use of”.* (Officer 5 from Malaysia)

Another respondent emphasises that as mobile phone is a common device, it is inappropriate to discourage students from using this device (*Head 8 from Malaysia*). The respondent believes that it is timely to start introducing mobile learning through mobile phones.

Four respondents are confident that with the proliferation of mobile phones, mobile phones could become a tool to support teaching and learning (*Head 3 (a) from United Kingdom, English 12 from Malaysia, English 11 from Malaysia and Head 12 from Malaysia*). One of them comments:

*“We can see that everyone has mobile phones, everyone has it, even the fisherman has it, and it has become an essential device for students to communicate. If we use it to support English learning, I can see it will do wonders.”* (Head 12 from Malaysia)

### **Theme 3: Mobile phone as a future teaching and learning tool**

Analysis of the interviews also shows that the respondents have a vision that mobile phones could become a teaching and learning tool in the future. A respondent was confident about the possibility of change in education (*English 1 from the United Kingdom*). Another teacher predicts that mobile phones have the prospect to be used in the future:

*“I can see that there is a prospect to use mobile learning in the future. We should be more advance in our educational system. We need to prepare students for the next 10 years. We need to be prepared for the next 10 years. It is useless to discourage them from using mobile phones because eventually it will become an ordinary tool for everyone.”*(Head 8 from Malaysia)

Five respondents also have the vision that the mobile phone will become an ordinary teaching and learning tool in the future. Two of them believe that there will

be changes in the existing policy which would help to realise the vision to implement mobile learning (*Officer 4 from Malaysia, Officer 5 from Malaysia*). A respondent comment:

*“But, I think policy can be changed. Because it was at that time, they don’t see the need. Now, with changes in technology, I think it will be soon”.* (Officer 5 from Malaysia)

Two respondents predict that mobile learning will be used as an educational tool within ten years (*Head 11 from Malaysia, Officer 2 from Malaysia*). On the other hand, two respondents suggest that it will happen within five years (*Officer 1 from Malaysia, Officer 5 from Malaysia*)

#### **Theme 4: Mobile phone as a tool to support various learning activities**

Another key point established in the analysis is the potential of mobile phones to support various learning activities. A respondent was enthusiastic with the potential of using mobile phones in education:

*“Majority of the students have mobile phones. Therefore, how should we reap the benefits from this device? This is what we need to think of and change. I think your idea is good. Why not we use mobile phones for the educational purpose? It is a superb idea indeed”.* (English 6 from Malaysia)

Another respondent also has a similar opinion about the potential to use mobile phones as a tool to support learning activities (*English 1 from the United Kingdom*).

The respondents highlight the affordances of mobile phones to support learning activities. Three respondents stress that mobile phones enable students to conduct learning activities regardless of time and place (*ICT 12 from Malaysia, Head 6 from Malaysia and ICT 10 from Malaysia*). In addition to supporting mobility, mobile phones could also support interactive learning as the two respondents comment:

*“It is good. That means it is a concept which enable students to learn anywhere, anytime and they can get immediate feedback from it”.* (Head 6 from Malaysia)

*“It’s the easy access, fast, they can just bring along. OK, I want to search the meaning of envy, they can get it immediately. It is as easy as that”.* (Officer 2 from Malaysia)

A respondent reports that some students have been using mobile phones to collaborate in learning activities:

*“Many students use mobile phones in a positive way. They exchange questions with their friends. I know this thing happens. Some of them even exchange questions from friends in different states. This is good to help them to study”.* (Head 8 from Malaysia)

Another advantage which was raised by the respondent is that mobile phones could provide valuable information to students:

*“Mobile phone is a medium of information. Students can get information anytime they want. They can get it anywhere. There is a prospect for mobile phones to become a medium of information to students.”* (Head 8 from Malaysia)

#### **Theme 5: Mobile phones as an affordable tool**

Analysis of the interviews also established another opportunity to implement mobile learning. Two respondents believe that mobile phone is an affordable tool which should be explored to support educational purposes. They believe that deploying mobile phones would be cost effective compared to a desktop computer. Their comments include:

*“For me, the set-up cost for e-learning is actually higher than mobile learning. Nowadays, all students have mobile phones. So, with regard to the cost, mobile learning is more cost effective. There is no excuse why students will not utilise mobile learning.”* (ICT 7 from Malaysia)

*“Actually, mobile learning is similar to e-learning, and it is a viable option for those who could not afford to buy computers. Not everyone can afford a computer”.* (English 12 from Malaysia)

## **Theme 6: Mobile phones as an engaging and motivational tool**

Interview data show that the respondents were optimistic with the potential of the mobile phone as an engaging and motivational learning tool. A respondent highlights the students' interest to use emerging technology which includes mobile phones:

*“On Friday last week, as a whole school we had a session and during that session the students gave a presentation on designing the curriculum students want.....and they end it up, with the teacher, you know the student playing teacher with the pile of that electric gadget and he got a real laugh from the staff. We recognise that as what we always said to the students, put your mobile phones away from my lesson, put your iPod away, but actually, what I think this does, or what it could do to us is using the technology that students use, ..... I think the idea that you got is to use the latest technology”.* (English 3 from United Kingdom)

Three respondents agree that mobile phones could provide an engaging learning environment (*English 2 from United Kingdom, English 1 from the United Kingdom and English 4 (b) from the United Kingdom*). One of them comments:

*“I think children love playing with mobile phones, there is no getting away from them, in fact the minute their mobile phones beep, and they will pick it up. So, they will see the word introduced in the mobile lessons.”* (English 2 from United Kingdom)

Two respondents also highlight that with the element of fun that mobile phones offer, it could also motivate students to study (*English 4(a) from the United Kingdom and English 1 from the United Kingdom*).

### **Theme 7: Mobile phones to prepare students for their future**

Data analysis also reveals the potential of mobile phones to prepare students for their future. A respondent believes that it is important to prepare students with digital literacy by using mobile phones or smart phones because it will help them to be prepared for their future career. The respondent comments:

*“You must prepare them now for the future, because they may use iPhone, iPad and Blackberry. All being used by people in the corporate world and our students are coming out to the corporate world. It’ll be a shame if they do not know how to use it.”* (Officer 5 from Malaysia)

The respondent further comments:

*“So, there’s a big potential. I think we need to use this device. It’s not that we’re putting the burden into the students; we think that they need to know so that they can tackle their life in the future. Technology will be getting more and more and more advance. If a child doesn’t know how to access internet on a smart phone, now if the child cannot do it in school, when he goes out to work, is it going to be easy for him? Does he know the capability of using the phone?”* (Officer 5 from Malaysia)

## Emerging themes: challenges

Findings from the field tests established the challenges to implement mobile learning in Malaysian schools. The following sub-sections discuss the challenges.

Theme 1: Issue with misuse
Theme 2: Issue with current policy
Theme 3: Issue with management and maintenance
Theme 4: Issue with stakeholders
Theme 5: Issue with digital divide
Theme 6: Issue with personal space invasion

### Theme 1: Issue with misuse

Analysis of interview data shows that misuse is one of the major challenges to implement mobile learning. This was highlighted by eight respondents in the field tests (*Head 6 from Malaysia, Head 10 from Malaysia, Head 13 from Malaysia, English 8 from Malaysia, Officer 1 from Malaysia, Officer 2 from Malaysia, Officer 3 from Malaysia and Officer 4 from Malaysia*). Two respondents raise the possibility of misuse via Multimedia Messaging Service (MMS) (*Head 8 from Malaysia, Head 13 from Malaysia*). In addition, a respondent raises the issue of misuse via Bluetooth (*ICT 4 (a) from United Kingdom*).

Two respondents highlight another type of bullying which is associated with the use of mobile phones (*Head 3(a) from United Kingdom and Head 1(a) from United Kingdom*). This is known as cyber bullying as one them comment:

*“What we discovered with MSN and mobile phones with texting is a new form of bullying, which students genuinely don’t think it as bullying. They think that somehow the world of text messaging is slightly different from the real life and therefore sending nasty text is okay. I think students genuinely have problems with*

*understanding these issues, which is why they need to be taught.” (Head 3 (a) from United Kingdom)*

Three respondents were sceptical about the use of mobile phones in education (*English 8 from Malaysia, Head 8 from Malaysia and English 6 from Malaysia*). They believe that the government will not support the use of mobile phones in education because the government might be concerned about misuse. One of them provides the opinion:

*“Do you think the government will sponsor? I don’t think so. If the government sponsors students to use mobile phones, it might be misused for other purposes. Even like the computers, many students misuse the computers when the teacher is not around. They use it for other purposes, not for school purposes.” (English 8 from Malaysia)*

Two respondents justify their opinion with the circulation distributed by the Ministry of Education, Malaysia which prohibits the use of mobile phones in schools (*Head 8 from Malaysia, Head 11 from Malaysia*). The following statement is an interview excerpt from one of the respondents:

*“.....because it does not mean that students will use mobile phones for communication only, they will use SMS to send inappropriate photos and other things. That’s what we found from their mobile phones. Now, government had made it clear to prohibit the use of mobile phones at school through recent circulation.” (Head 11 from Malaysia)*

There was also a concern about the teachers’ workload to handle misuse:

*“It will bring more problems for students themselves and might bring problems to teachers as well. There will be problems for teachers to control students.” (Head 7 from Malaysia)*

However, the respondents also raise some solutions to address the issue:

- (i) To introduce mobile learning to the students who are interested to use mobile learning (*ICT 12 from Malaysia, Head 10 from Malaysia, Head 6 from Malaysia, Head 5 from Malaysia, and ICT 9 from Malaysia*).
- (ii) To introduce mobile learning to the Smart Schools' students, who are familiar with the use of technology in education (*Head 10, Head 5, ICT 9*). They suggest offering mobile learning as an optional learning tool for non-Smart School students (*Head 6, Head 5, ICT 12*).
- (iii) To use specific mobile phones which have parental features to monitor students in using mobile phones for learning purposes (*Head 8 from Malaysia*).
- (iv) To introduce mobile learning to upper secondary school students who would be wiser and more responsible in using mobile phones compared to lower secondary school students (*Officer 4 from Malaysia*).

## **Theme 2: Issue with the current policy**

Analysis of interview data also indicates that there is an issue associated with the current policy. Seven respondents believe that the circulation distributed by the Ministry of Education, Malaysia which prohibited the use of mobile phones would become the challenge to utilise mobile learning in Malaysian schools (*English 12 from Malaysia, Head 10 from Malaysia, Head 12 from Malaysia, Head 6 from Malaysia, ICT 11 from Malaysia, English 6 from Malaysia, English 8 from Malaysia*).

According to two respondents, the government had issued the circulation as the result of misuse (*Head 8 from Malaysia, Head 11 from Malaysia*). One of the respondents implies:

*"I think for now, students are not able to bring mobile phones to school. We know that mobile phones support communication and has become an essential tool for everyone. However, when students brought it to school, negative things will*

*happen. Not all students will use it for communication only. There will be improper content on their mobile phones. Therefore, the policy is clear why mobile phones are not allowed to be brought to school.” (Head 11 from Malaysia)*

A respondent suggests that only with changes in the policy, the vision to implement mobile learning will become a reality (*Head 11 from Malaysia*). The respondent comments:

*“This is a good idea to enhance English Language learning, most students have mobile phones.....However, in the effort to implement mobile learning at school, I think changes in the current policy are necessary. If not, this will not happen.”*  
(Head 11 from Malaysia)

This opinion was also supported by two respondents (*Officer 4 from Malaysia and Officer 5 from Malaysia*). However, they also believe that there is a possibility of change in the policy which would support the use of mobile phones in teaching and learning (*Officer 4 from Malaysia and Officer 5 from Malaysia*).

### **Theme 3: Issue with the management and maintenance**

With regard to the management and maintenance, the analysis indicates that there are issues associated with cost and organisation. Seven respondents are concerned with the cost to use mobile phones in teaching and learning (*Head 12 from Malaysia, English 5 from Malaysia, English 8 from Malaysia, English 13 from Malaysia, Officer 1 from Malaysia, Officer 2 from Malaysia, Officer 3 from Malaysia*). A respondent believes that the cost of using mobile phones would bring pressure to parents (Head 2 from the United Kingdom).

In addition to the cost related to SMS (*Officer 1 from Malaysia, Head 8 from Malaysia*), a respondent also raises the issue related to the cost of using MMS (*Officer 1 from Malaysia*).

The respondents also believe that the organisation of mobile learning is time consuming. A respondent preferred to use e-learning rather than mobile learning

because to implement mobile learning is time consuming and would not bring significant benefit compared to e-learning (*English 2 from the United Kingdom*). This is parallel to the opinion by other respondents:

*"It would be far too much time money effort, for minimum benefit."* (English 4(a) from United Kingdom)

*"It needs many commitments from many people and needs a lot of money".* (Head 10 from Malaysia)

In addition, a respondent believes that while it would be possible to obtain funding from the government, it might be a challenge to maintain the facilities (*Head 5*). This issue was also raised by Officer 2 from Malaysia. Below is an excerpt from the interview:

*"As of now, to maintain a system, it is so much effort and a lot of work from school. Because we are not like other countries, another part of the world is service oriented, we are not service oriented. We always give but never maintain".* (Officer 2 from Malaysia)

Four respondents also highlight a possible technical issue associated with unstable network connection to support the implementation (*Head 7 from Malaysia, English 7 from Malaysia, English 9 from Malaysia, Officer 1 from Malaysia*). A respondent comment:

*"I think it all depends on the system itself, for example, the server. Because we know, with technology, there must be flaws. That's what we always face here. If the server goes down, it is impossible to use mobile learning".* (English 7 from Malaysia)

Other concerns which are raised by the respondents are issues with regard to theft and loss (*English 6 from Malaysia, ICT 3(b) from United Kingdom*). A respondent comment:

*“But you know if you have a whole class of students bringing like a PSP to school, they would be a pretty desirable target for theft”. (ICT 3(b) from United Kingdom)*

Health hazard is another concern which was raised by a respondent:

*“There are also certain medical issues, when you use mobile phones for texting, it could cause hazard to your health. There may come the time when we shouldn’t be doing thing as much as we do now.” (ICT 3(b) from United Kingdom)*

#### **Theme 4: Issues with stakeholders**

Another key point established in the analysis is the issues with stakeholders. Stakeholders may bring impact to the success of implementing mobile learning. There will be resistance to change as exemplified in e-learning implementation in Malaysian schools:

*“Yes. That is always the biggest challenge. We experienced that in our “Bistari” last time, the Smart School. I think as the technology evolves everything new, every time there’s something new, we have to address the human factor first.... I think it’s the same with mobile phone, in the beginning if you implement, there will be resistance especially if it’s a new device. If it’s like a mini-size computer, maybe the acceptance will be easier, but then it depends on how easy it is to use.” (Officer 5 from Malaysia)*

Two respondents believe that the Malaysian people’s attitude which has an inadequate sense of responsibility towards public facilities and inadequate interest in knowledge acquisition contribute towards the challenge to implement mobile learning (ICT 8 from Malaysia, Officer 1 from Malaysia). One of the respondents explains:

*“Our environment and culture compared to developed countries are not the same. They are more responsible, for example towards public facilities. In our community, we can see there are lots of public facilities being damaged. Compared to them, we*

*are far from them. It is our attitude. It is possibly a huge challenge.”* (ICT 8 from Malaysia)

The issue with regard to the students' attitude has been raised by the respondents. Six respondents believe that it is a challenge to address the students' attitude (*English 11 from Malaysia, English 5 from Malaysia, English 8 from Malaysia, English 10 from Malaysia, English 4(b) from United Kingdom and English 2 from United Kingdom*). This is particularly true with the students who have a negative attitude towards learning. It would be difficult to attract them to use mobile phones for learning. A respondent relates this issue with the students' attitude:

*“I think it is all about the attitude. For example, my students, we distribute newspapers for them to read, to enhance their English, but for some students they are not interested at all. That's why I think students also have to have their own initiative to improve themselves. If they don't try to do anything, I guess nothing will happen”.* (English 11 from Malaysia)

A respondent hesitates to integrate mobile lessons into the existing curriculum. It is difficult to anticipate the students' attitude towards the mobile lessons because mobile learning is a new educational technology (*English 4(b) from United Kingdom*). Moreover, a respondent argues about the students' willingness to commit to schedule in utilising the mobile lessons (*English 4(a) from United Kingdom*).

There is also a concern that students would not be able to use mobile learning to support their learning activities because of time constraint:

*“You must remember that schools nowadays are different. Students are busy. I'm not sure about schools in other states, but in Terengganu, they have many co-curriculum activities and extra classes. They don't even have time to play. Even students in primary school have extra classes”.* (English 6 from Malaysia).

In this study, the importance of induction sessions to support the mobile learning implementation was established. A respondent believes that the success of the

induction would depend on the students' attitude (*Head 13 from Malaysia*). Seven respondents believe that the induction sessions would only be effective for students who are receptive towards changes in education (*Head 5, Head 8, Head 6, Head 7, Head 11, Head 13, Head 10 from Malaysia*). Therefore, a respondent's point out that in addition to induction, ongoing support is also necessary to ensure that students would have the proper attitude, sufficient knowledge and skills for the implementation (*Head 13 from Malaysia*).

However, a respondent was sceptical with the idea to change students' attitudes with induction (*Head 5 from Malaysia*). The respondent believes that knowledge and skills could be improved with the induction, but not attitude. The respondents also believe that students' attitude would depend on the areas that they belong and stresses that students in urban areas would be more interested to enhance their English Language compared to students in rural areas.

In this study, the importance of the acceptable use policy to guide students in using mobile phones in learning activities was also established. Five respondents believe that the effectiveness of this policy would depend on the students' attitude (*ICT 12 from Malaysia, ICT 9 from Malaysia, ICT 8 from Malaysia, ICT 7 from Malaysia, and ICT 10 from Malaysia*). Thirteen respondents believe that although the acceptable use policy has the potential to address the issue of negative implications, it is possible that certain students would be reluctant to comply (*Head 5 from Malaysia, Head 13 from Malaysia, Head 8 from Malaysia, Head 6 from Malaysia, Head 10 from Malaysia, Head 7 from Malaysia, Head 11 from Malaysia, ICT 4(a) from United Kingdom, ICT 8 from Malaysia, ICT 7 from Malaysia, ICT 10 from Malaysia, ICT 12 from Malaysia, ICT 9 from Malaysia*).

To support the implementation, the study also established the significance of providing a loan scheme for the students who could not afford to acquire mobile phones. However, two respondents point out that students would be less responsible towards loan item (*ICT 5 from Malaysia, ICT 11 from Malaysia*). The respondents justify their opinion based on the textbook loan scheme in Malaysian schools.

On the other hand, a respondent believes that students will be interested in mobile learning if they believe that it brings advantages to them and relevant to their future (English 9 from Malaysia).

The respondents also express their concern about the teachers' attitude. Three respondents believe that while teachers would accept the use of mobile phones for educational purpose, it might be possible that a minority of them would show their resistance (*Head 6 from Malaysia, Head 10 from Malaysia, Officer 4 from Malaysia*). The respondents also believe that to change teachers' attitudes will take time (*English 1 from the United Kingdom and Head 13 from Malaysia*). Teachers would show their resistance because they would be concerned with the workload to monitor students in using mobile phones:

*"I think for a lot of teachers; they're afraid that they couldn't cope if students have mobile phones in school; the students accessing the internet or messages and so on".* (Officer 5 from Malaysia)

The respondent also relates this issue to the challenges to address the teachers' attitude when e-learning was introduced in Malaysian schools:

*"Like before, if you're worried that by giving the students the computer, you cannot control the students because the students can multitask, go on the internet, and see other things while you're teaching. It is the same thing with mobile phones. You have a mobile phone, you think you're afraid of that the students cannot be controlled because he has own personal messages or phone calls."* (Officer 5 from Malaysia)

Four respondents also believe that there will be concern among teachers that the implementation of mobile learning could bring extra workload to learn new skills to deploy mobile learning (*Head 5 from Malaysia, 8 from Malaysia, ICT 8 from Malaysia, Head 6 from Malaysia*).

On the other hand, a respondent suggests that teachers would have a positive attitude with the use of technology if it is necessary and relevant to them (*Head 5 from Malaysia*). This is parallel to another respondent's opinion:

*"The teachers are very busy people and there are a lot of changes in the world of teaching. I think as long as the teachers know why there is a need for this and how it's going to help the students; if they know the answers to these two questions, they'll be very happy. If they can't see it clearly, they'll be less enthusiastic about it..... I think whether they see it is as a burden or help will depend on how they see it in terms of helping the students' learning. I think this is very good".* (Head 3(a) from United Kingdom)

Therefore, as highlighted in the implementation strategy, ongoing support and monitoring is essential to encourage positive attitudes (*Head 13 from Malaysia*).

The issue with regard to the parents' attitude was also raised by the respondents. Most parents are not familiar with mobile learning; therefore it is quite challenging to predict their response (*Head 5 from Malaysia*). In addition, the parents' status as digital immigrants could contribute towards the challenge to introduce the use of using mobile phones for educational purpose (*Officer 1 from Malaysia*). A respondent highlights the challenges to address the parents' attitude when e-learning was introduced at Malaysian schools (*Officer 3 from Malaysia*).

Parents would be bemused by the idea of using mobile phones in education because of the nature of mobile phones as a communication tool. A respondent implies:

*"Parents do sometimes think that when young people are using a bit of technology, they are socialising. And they would not let the children use it. But, it is really important to understand that technology could be used for the purpose of learning and you know what when the children are doing their homework that actually using a piece of technology, and they need to understand that."* (Head 3(a) from United Kingdom)

Parents would also be bemused with the changes in the policy because previously schools prohibited the use of mobile phones. A respondent comment:

*“The issue with parents would be, because they maybe some cases, where we actually want them to bring mobile phones to school, this is the tension really because our current policy, although we all agree it is impossible, mobile phones should not be brought to school. And now what we are saying is to encourage them to bring it to school. So, it actually involves a change of policy.”* (Head 2 from the United Kingdom)

Three respondents believe that purchase scheme could cause parents’ uproar (*Head 5 from Malaysia, Head 3(b) from United Kingdom and Head 1(b) from United Kingdom*). Parents would also question the rational of the ownership model which are formulated for the implementation as one respondent justifies the opinion:

*“That has a difficulty in itself, because if you are going to do something on an actual basis, you could be very well have a parental perception that I as a parent gives donation, and my neighbour is not, so why should I subsidised the scheme when they can get it for free.”* (Head 1(b) from United Kingdom)

Three respondents believe that parents’ attitude would depend on the area that they belong (*Head 11 from Malaysia, Head 5 from Malaysia, Head 9 from Malaysia*). They believe that the parents who are in the urban areas usually among educated people and they would support the schools in implementing mobile learning (*Head 11 from Malaysia, Head 5 from Malaysia, and Head 9 from Malaysia*). For them, the response from the parents in the rural areas would not be as good as the response from the parents in the urban areas (*Head 11 from Malaysia, Head 5 from Malaysia, and Head 9 from Malaysia*).

However, another respondent believes that head teachers’ reputation is a factor which could foster parents’ support (*Head 12 from Malaysia*). The respondent believes that schools with head teachers that have good reputation would encourage parents to support educational activities at schools.

### **Theme 5: Issue with digital divide**

Data analysis also reveals the issue with the digital divide. A respondent suggests that it is important to ensure that students have equity access to the mobile phones so that the digital divide will not occur. The respondent relates to an online programme launched by the school:

*“If there is a particularly learning avenue in school, everyone should have the same access to it. I wouldn’t endorse a particular way of teaching-learning that excluded people for social-economic reason, financial reason. That’s where we have to be very careful here. We launched a program at school, so that all our resources can be accessed by the Internet. But we must be very careful because not every family have Internet at home, so that they got enough access to it in school. So, until literally everyone can access a certain amount of things, you can’t have them doing homework that way…… we have to make sure that there is sufficient access. If you introduce it, you got to make sure that you would also introduce coverage for everybody.”* (Head 2 from the United Kingdom)

Two respondents believe that mobile learning might lead to digital divide (Head 1 (b) from United Kingdom, Officer 2 from Malaysia). One of them implies:

*“I would argue that, in a school like this, the digital divide is actually greater for some children than area that maybe you’ve got there I say more uniform deprivation. The danger to a scheme, such as the one you are proposing, the one that we have for our laptop for learning, is extending the digital divide”.* (Head 1(b) from United Kingdom)

For another respondent, the issue with cost to acquire mobile devices might lead to digital divide:

*“Actually, the technology becomes very expensive then, from what I see from handing the laptops out to pupils with technical support can cost about 720 pounds, where you could buy a laptop for perhaps about 300 pounds. If you don’t have the extra money it would be that the digital gap gets bigger rather than smaller. If you*

*can't join in the whole team, so you won't join at all. So, I'm worried about the cost."*  
(ICT 4(a) from United Kingdom)

### **Theme 6: Issue with personal space invasion**

Another issue which was established in the analysis is associated with the personal space invasion. Students expect that their mobile phones are personal things. Therefore, students would be bemused with the concepts of using their mobile phones for educational purposes. A respondent comment:

*"However, I am not entirely sure what the response would be. I think a lot of children would be confused, as to why, they usually use mobile phones as a social thing and now it is taken over by the school".* (English 4(b) from United Kingdom)

The respondent also comments:

*"As I said, it could be seen like the children think, yeah, I could do it on my mobile phones, and other children will say, no, I am not able to do it, because my phone is my social thing, Why should I let school invades my social thing. "* (English 4(b) from United Kingdom)

Another respondent also stresses that there would be a challenge to enforce the acceptable use policy to personal mobile phones (*Head 9 from Malaysia*). It would be difficult for schools to monitor students' own mobile phones compared to the loan devices (*Head 9 from Malaysia*). Another respondent also raises similar concerns:

*"However, for students who own the mobile phones, it is their personal thing. So, how are we supposed to monitor their personal thing?"* (English 12 from Malaysia)

## Summary

This section explores the emerging themes established in the study. There are two main themes emerged from the data analysis. These are opportunities and challenges to implement mobile learning in Malaysia. With regard to the opportunities, this falls under the headings of: English language subject support; proliferation of mobile phones; future teaching and learning tool; other subjects support; affordability; motivational tool and preparing students for the future with digital literacy.

Interviews establish that the respondents are positive towards the possibility of using mobile phones to support English language subject in Malaysian schools. Respondents were enthusiastic and suggest proposing to the government to use mobile phones in education. The pedagogical affordances of mobile phones raised by the respondents include; supplementing English subject outside school hours, supporting interactive learning, supporting drill and practice, encouraging systematic learning, raising students' confidence in learning English and encouraging students to become autonomous learner.

The proliferation of mobile phones contributes toward the potential of utilising mobile phones in mainstream schooling in Malaysia. The study established that there is a need to harness the proliferation of mobile phones to be used in education. Moreover, it is also inappropriate to discourage students from using mobile phones in educational activities because eventually it will become an ordinary tool for everyone.

The respondents also have a vision that mobile phones could become a teaching and learning tool in the future. They are positive with the possibility of change in education. They believe that there will be changes in the policy at schools which will realise the vision to implement mobile learning. They predict that this will happen within five to ten years.

Mobile phones also have the potential to support other subjects and various learning activities. Respondents suggest that mobile phones can be used as an

alternative tool to support learning activities as well as to become a medium of information. The respondents also recognise the affordances of mobile phones in education to support mobility, collaborative learning activities and interactive learning.

Mobile phones are also perceived as an affordable tool which should be explored to support teaching and learning purposes. Respondents believe that deploying mobile phones would be cost effective compared to desktop computers. Respondents also highlight the affordances of the mobile phone as an engaging and motivational tool. The respondents were positive that the mobile phone would engage students in their learning activities. They also believe that with the element of fun in using the mobile phones, it would encourage students to be motivated to study. Finally, mobile phones are also perceived as a tool to prepare the student with digital literacy. This would help them to be prepared for their future career.

With regard to the challenges, the keywords are misuse, current educational policy, management and maintenance, stakeholders' attitude, digital divide and personal space invasion. Respondents believe that misuse is a major challenge that needs to be addressed to implement mobile learning. For them, misuse might discourage the government to support the use of mobile phones in education. There are possibility of misuse via MMS and Bluetooth. It is also possible that cyber bullying will occur through mobile phones. Respondents also concern about the teachers' workload to handle misuse. However, the respondents suggest to introduce mobile learning to the Smart Schools' students, who are familiar with the use of technology in education and to offer mobile learning as an optional learning tool for non-Smart School students and for the students who are interested to deploy mobile learning. Moreover, the respondents also suggest using specific mobile phones which have parental features to monitor students in using mobile phones for learning purposes and to introduce mobile learning to upper secondary school students who would be wiser and more responsible in using mobile phones compared to lower secondary school students.

For the respondents, educational policy is another challenge to implement mobile learning. The policy which prohibited the use of mobile phones in schools would

become the challenge to implement mobile learning. They believe that only with changes in the policy, mobile learning could be implemented in Malaysian schools. However, they also believe that there is a possibility of change in the policy which would support the use of mobile phones in teaching and learning.

Another major issue which was raised by the respondents is related to the management and maintenance. Respondents are concerned with the cost of deploying mobile phones for teaching and learning. They also believe that the organisation of mobile learning is time consuming. Other concerns related to management and maintenance is technical issue, theft, loss and health hazard.

In addition, respondents also believe that the stakeholders' attitude might be a challenge to implement mobile learning. The challenges might arise from the students, teachers, parents and the community. As exemplified in the e-learning implementation in Malaysian schools, the respondents believe that it is likely that Malaysian schools will face the similar challenges in implementing mobile learning. The respondents also believe that the attitude of Malaysian people who has inadequate sense of responsibility towards public facilities and inadequate interest in knowledge acquisition contribute towards the challenge in implementing mobile learning. The respondents also highlight the challenge to address the Malaysian students' attitude. There will be challenges to raise their interest in deploying mobile learning among the students who already have a negative attitude towards learning and who are less receptive towards changes in education especially to the students in rural areas. As a new educational technology, there will be challenges in addressing the students' anticipation towards mobile learning. Students might also be reluctant to commit to schedule to receive the mobile lessons and not be interested to deploy mobile learning because they are already preoccupied with various co-curriculum activities and extra classes. Another challenge associated with the students' attitude is the inadequate sense of responsibility towards loan items among Malaysian students. On the other hand, the study established that the students will be interested in deploying mobile learning if it brings advantages to them and relevant to their future.

Regarding the issue with teachers, the study established that while Malaysian teachers would accept the use of mobile phones for educational purpose, it might

be possible that a minority of them would show their resistance. The challenges might be initiated from the teachers' concern that the implementation of mobile learning would bring extra workload to them; to learn new skills to deploy mobile learning and to monitor students to use the mobile phones productively. On the other hand, the study also established that teachers will have a positive attitude with the use of technology if it is necessary and relevant to them. The issue with regard to the Malaysian parents' attitude was also established in the study. As a new educational technology, there is a need to address the issues with the parents' anticipation towards mobile learning especially among the parents in rural areas. The parents' status as digital immigrants would also contribute towards the challenges in introducing mobile phones for educational purposes and they would be bemused with the idea of using mobile phones because they are accustomed to the notion of mobile phones as a communication tool. Parents would also be bemused with the changes in the policy as previous schools prohibited the use of mobile phones. Parents would also concern with the expenses in deploying mobile learning. On the other hand, the study established that the head teachers' reputation is a factor which could foster parents' support.

Another issue which was raised by the respondents is the issue with the digital divide. Although for some respondents the use of mobile phones is cost effective, it might also lead to digital divide as the result of the possible cost issue in acquiring the device. The final challenge which was highlighted by the respondents is associated with the personal space invasion. For the students, they might be bemused with the concepts of using their mobile phones for educational purposes.

The analysis has established two emerging themes in implementing mobile learning in Malaysia. These are the opportunities and challenges. In this chapter, there are four sections which are dedicated to presenting the findings. The sections include; Evaluation of the implementation strategy: preliminary field tests, Evaluation of the implementation strategy: main field tests, Dissemination and distribution of the implementation strategy and Emerging themes in the implementation of mobile learning. This section marks the end of the findings from the study. The next chapter continues with the discussion and draws the conclusion to the study.

## **Chapter 5: Discussion and conclusion**

This chapter marks the end of the study and begins by summarising the study, before discussing the research questions explored. The answers to the research questions are discussed by considering the relevant literature. Additionally, the limitation of the study is discussed. Finally, the implication of the study and the recommendation for future research are proposed.

### **Summary of the study**

This study has contributed towards the body of knowledge associated with mobile learning implementation in Malaysia. In this study, an implementation strategy to be used in the implementation of mobile learning in Malaysian secondary schools was developed. The implementation strategy is documented into two main sections. These are: (i) mobile technology integration and (ii) the policy and procedure to support the implementation of mobile learning. Mobile technology integration established the structure of the mobile lessons and the strategy to provide facilities to implement mobile learning. The implementation strategy also established the policy and procedure to support the mobile learning implementation. The components include; (i) suggestions regarding the strategy to help students acquire mobile devices, (ii) suggestions regarding the regulation to guide students in using mobile technologies for learning, (iii) suggestions regarding the strategies to manage and maintain the facilities, (iv) suggestions regarding the specific roles to support the implementation and (v) suggestions regarding the support which will be needed in the implementation.

The implementation strategy was developed based on the literature review. Then it was revised based on the perspectives from the educational experts in secondary schools in the United Kingdom followed by Malaysia. This study is underpinned by Educational Research and Development (ER&D) method by Borg and Gall (1979). Following the initial design of the implementation strategy, there were three stages of field tests applied. In the preliminary field tests, the implementation strategy was revised with the opinion of the English subject leaders, ICT subject leaders, head teachers and deputy head teachers from the schools in the United Kingdom. In the main field tests, the implementation strategy was revised with the opinion of the

English subject leaders, ICT subject leaders, head teachers and deputy head teachers from the schools in Malaysia. It is the outcome of this study that the implementation strategy is validated or modified as a result of consultation from the range of stakeholders and experts in education from the United Kingdom and Malaysia. The findings of the preliminary field tests and the main field tests established the consensus with the implementation strategy developed in the study. However, there are some areas, which have been improved by the suggestions raised by the respondents. The following table depicts the summary of findings from the preliminary field tests and main field tests which contribute towards the revision of the implementation strategy.

<b>Change type</b>	<b>Source of data</b>	<b>Reference in the implementation strategy</b>	<b>Research question</b>
Structure	Respondent (preliminary field tests)	1.1 Mobile lessons, page 1-2	1.1
	Respondent (main field tests)	1.1 Mobile lessons, page 1	1.2
	Respondent (main field tests)	1.1 Mobile lessons, page 2	1.2
	Respondent (main field tests) and literature	1.1 Mobile lessons, page 3	1.2
	Respondent (main field tests)	1.1 Mobile lessons, page 3	1.2
	Respondent (main field tests) and literature	1.1 Mobile lessons, page 3	1.4
	Respondent (main field tests) and literature	1.1 Mobile lessons, page 3	1.3
	Respondent (main field tests)	1.2 Resourcing mobile learning, page 5	Additional strategy
	Content	Respondent (preliminary field tests) and literature	1.1 Mobile lessons, page 2-3
Respondent (main field tests)		1.1 Mobile lessons, page 1	1.2
Respondent (main field tests)		1.1 Mobile lessons, page 2	1.2
Respondent (main field tests)		1.1 Mobile lessons, page 3	1.2

Practice	Respondent (preliminary field tests) and literature	1.2 Resourcing mobile learning, page 6	1.11
	Respondent (preliminary field tests) and literature	2.5 Support for major stakeholders, page 12	1.6
	Respondent (preliminary field tests) and literature	2.5 Support for major stakeholders, page 13	1.6
	Respondent (preliminary field tests)	2.3 Management and maintenance, page 10	1.12
	Respondent (preliminary field tests) and literature	2.3 Management and maintenance, page 10	1.12
	Respondent (preliminary field tests)	2.3 Management and maintenance, page 10	1.12
	Respondent (preliminary field tests)	1.2 Mobile lessons, page 2	1.3
	Respondent (preliminary field tests) and literature	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
	Respondent (main field tests) and literature	1.2 Resourcing mobile learning, Page 6	Additional strategy
	Respondent (main field tests)	2.1 Ownership model, page 7	1.11
	Respondent (main field tests)	2.1 Ownership model, page 7	1.11
	Respondent (main field tests) and literature	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
	Respondent (main field tests)	2.5 Support for major stakeholders, page 13	1.7
	Respondent (main field tests) and literature	Introduction, page iii	Additional strategy
Policy and procedure	Respondent (preliminary field tests) and literature	2.3 Management and maintenance, page 10	1.12
	Respondent (preliminary field tests) and literature	2.5 Support for major stakeholders, page 12	1.5
	Respondent (preliminary field tests) and literature	2.5 Support for major stakeholders, page 12 to page 13	Additional strategy
	Respondent (preliminary field tests)	2.5 Major support for major stakeholders, page 13	1.7

Respondent (preliminary field tests)	2.5 Support for major stakeholders, page 13	1.7
Respondent (preliminary field tests)	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
Respondent (preliminary field tests)	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
Respondent (preliminary field tests)	2.4 Specific roles for supporting mobile learning at schools, page 11	1.8
Respondent (preliminary field tests)	2.5 Support for major stakeholders, page 12 to page 13	1.9
Respondent (preliminary field tests)	2.4 Specific roles for supporting mobile learning at school, page 11	1.8
Respondent (preliminary field tests)	2.3 Management and maintenance, page 10	1.12
Respondent (main field tests)	2.3 Management and maintenance, page 9	1.12
Respondent (main field tests)	2.4 Specific roles for supporting mobile learning at school, page 10	1.8

**Table 13: Summary of the findings in preliminary field tests in the United Kingdom and main field tests in Malaysia in the indication of the contribution in the revision of the implementation strategy**

The table indicates the revisions through the preliminary field tests and main field tests. The aspect of structure refers to the revision of the proposed structure of the mobile lessons, while the aspect of content refers to the revision of the proposed content of the mobile lessons. Regarding the aspect of policy and procedure, it covers the revision of the suggestion in the management of mobile learning. The aspect of practice covers the revision of the management approach in mobile learning which have direct implication for students. Revisions are made either from the respondent's perspective or by the combination of the respondent's perspective and literature. Further discussion about the findings are included in the next section, Research questions answered. Following the revision, the implementation strategy was disseminated and distributed to the officers in the Ministry of Education Malaysia. In addition to disseminating the implementation strategy, the final stage of the study also explored the potential of implementing mobile learning to complement the existing practices in Malaysian secondary schools. The opinions of the officers in the Ministry of Education, Malaysia are gathered. Moreover, this

study also explores emerging themes in the implementation of mobile learning in Malaysian schools. These emerging themes are explored from all stages in the field tests.

## Research questions answered

Research Question 1: What is an effective implementation strategy in utilising mobile learning for English Language vocabulary acquisition in Malaysian secondary schools?		
 Pedagogy	 Stakeholder	 Technology
<p>1.1 What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?</p> <p>1.2 What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?</p> <p>1.3 What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?</p> <p>1.4 What is an effective implementation strategy in delivering mobile lessons to enable students master the mobile lessons?</p>	<p>1.5 What is an effective implementation strategy in preparing teachers with proper attitude, knowledge and skills for the implementation?</p> <p>1.6 What is an effective implementation strategy in preparing students with proper attitude, knowledge and skills for the implementation?</p> <p>1.7 What is an effective implementation strategy in ensuring that parents are well-informed about the implementation to foster their support?</p> <p>1.8 What is an effective implementation strategy in proposing important roles to support the implementation?</p> <p>1.9 What is an effective implementation strategy in addressing negative implications on students in using mobile phones in education?</p>	<p>1.10 What is an effective implementation strategy in obtaining funding for the implementation?</p> <p>1.11 What is an effective implementation strategy in enabling students acquiring mobile phones to be used in the implementation?</p> <p>1.12 What is an effective implementation strategy in managing and maintaining the devices in the implementation?</p>

Figure 34: Research question 1 and the sub-questions

Research Question 2: How can mobile learning complement the existing practices in Malaysian secondary schools?			
 English Language subject support	 Malaysian school's ICT policy	 Malaysian Smart School's vision	 Alternative teaching and learning
2.1 How can mobile learning add value to the existing initiatives in Malaysian schools in improving students command in English Language subject?	2.2 How can mobile learning complement the policy in Malaysian Educational System to deploy ICT?	2.3 How can mobile learning complement the Malaysian Smart School's vision to deploy mobile technologies?	2.4 How can mobile learning become an alternative teaching and learning tool?

Figure 35: Research question 2 and the sub-questions

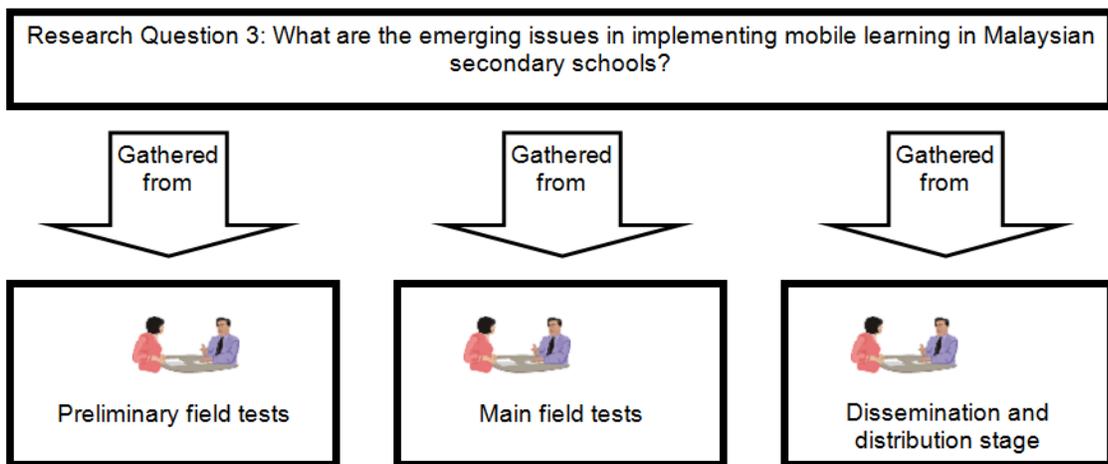


Figure 36: Research question 3

This study is guided by three research questions as depicted in the previous figures. The first research question is related to the content of the implementation strategy. It established the strategy to implement mobile learning in Malaysian secondary schools, which was documented in a handbook, entitled “Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia” as Appendix A to Appendix C. The findings which contribute towards the revision of the implementation strategy was summarised in Table 13. The handbook is part of the product arising from this study. The research question is:

## **What is an effective implementation strategy in utilising mobile learning for the English Language vocabulary acquisition in Malaysian secondary schools?**

To answer this research question, three concepts are identified which are pedagogy, stakeholder and technology. These concepts are the basis of the research sub-questions:

### ***Pedagogy:***

1.1) What is an effective implementation strategy in proposing pedagogically sound mobile lessons for English vocabulary acquisition?

1.2) What is an effective implementation strategy in integrating mobile lessons into the existing curriculum?

1.3) What is an effective implementation strategy in delivering mobile lessons to suit students' daily activities?

1.4) What is an effective implementation strategy in delivering mobile lessons to enable the students to master the mobile lessons?

To support the English vocabulary acquisition in Malaysian schools, the mobile lessons are projected to be delivered through Short Message Service (SMS), which consists of vocabulary introduction and explanation, vocabulary review through multiple-choice questions and feedback mechanism. The mobile lessons proposed support the notion of the impact of mobile phones through drill and practice process in aiding vocabulary acquisition as advocated by Levy and Kennedy (2005). The use of mobile phones was also aimed to provide an engaging, motivating and interactive learning environment, as well as offering students the mobility and bite size lessons which could complement Malaysian students' daily activities as stressed by Mellow (2005), Quinn (2000) and Kenning (2008). The respondents confirmed the appropriateness of integrating the mobile lessons for English vocabulary acquisition.

The mobile lessons are formulated to be integrated into learning activities at schools such as listening, speaking, reading and writing; as a type of blended learning. The mobile lessons are projected to conform to the syllabus provided by

the Ministry of Education, Malaysia. The respondents agreed with the suggestion. Moreover, science, mathematics and technical terminology as well as root word and family word related to the vocabulary are also recommended by the respondents. The respondents also suggest to explain the meaning of the vocabulary introduced in the mobile lessons in English Language to help students' understanding. They also suggest to use simple sentences with Malaysian context in the mobile lessons so that the mobile lessons would be suitable for English as a Second Language learner. A pronunciation mechanism using multimedia element to support students in learning the vocabulary is also suggested by the respondents. In addition, from the respondents' point of view, the mobile lessons are also projected to be used as a supplement to support teaching and learning; for enrichment and preparation. Additionally, it also appears from the data analysis that the mobile lessons are projected to be divided into two level; lower form (Form 1 to Form 3) and upper form (Form 4 to Form 5) and further divided into three levels which are beginner, intermediate and advance, so that students will have the opportunity to choose appropriate level which suits them. This concurs with the view of Shuler (2009), who highlighted the affordances of mobile phones to support personalisation.

To fit in with the students' daily activities, the mobile lessons are formulated to be delivered during out-of-school hours and during school holidays; every Monday, Wednesday and Friday. Students who attend the school during morning session will receive the mobile lessons in the evening while students who attend the school during afternoon session will receive the mobile lessons in the morning. The respondents agreed with the suggestions. This supports research such as that undertaken by Mellow (2005) about the affordances of mobile phones to encourage students to learn regularly through pre-set schedule. The respondents also recommended allowing students to request the mobile lessons to be delivered whenever appropriate. This resonates with the opinion by Shuler (2009), who highlighted the affordances of mobile phones to support personalisation.

The delivery schedule is also established to ensure that the students would be able to master the mobile lessons efficiently. This is parallel to the opinion by Uday Bhaskar and Govindarajulu (2008), Levy and Kennedy (2005) and Ibrahim and

Cavus (2008) who stressed the significance of appropriate scheduling in delivering mobile lessons. As a reflection to the respondents' perspectives, the mobile lessons are projected to be delivered according to the following schedule: (i) on Monday, first six words will be delivered, (ii) on Wednesday, another six words will be delivered together with the previous words that have been delivered on Monday, and (iii) on Friday, students are scheduled to review the words that they have learned through weekly quizzes. This finding can be seen as in line with the view of Genesee (2000), who highlighted that repetitive experiences are required in order to learn new words.

**Stakeholder:**

1.5) What is an effective implementation strategy in preparing teachers with the proper attitude, knowledge and skills for the implementation?

1.6) What is an effective implementation strategy in preparing students with the proper attitude, knowledge and skills for the implementation?

1.7) What is an effective implementation strategy in ensuring parents are well-informed about the implementation?

1.8) What is an effective implementation strategy in proposing important roles to support the implementation?

1.9) What is an effective implementation strategy in addressing negative implications for students in using mobile phones in education?

The implementation strategy stressed the importance to prepare teachers with the proper attitude, sufficient knowledge and skills for the implementation. This is parallel to the opinion by Pownell and Bailey (2001), Pownell and Bailey (2003), Juvy and Carino (2007) and Attewell (2005). It has been highlighted in the implementation strategy that training is important for teachers to ensure that they would be well informed regarding the benefits and objectives of the implementation, as well as to be provided with hands-on professional learning which is essential in implementing mobile learning. The respondents agreed with the suggestions. In addition, the respondents also recommended encouraging teachers to contribute in the pilot project in implementing mobile learning. This is in line with the opinion by Pownell and Bailey (2003), to provide the opportunities for the teachers to

participate in shaping the ICT programme so that it would instil a sense of ownership.

The implementation strategy highlighted the importance of support for students through induction sessions and ongoing support which was based on the findings of Williams (2006) and Attewell *et al.* (2009). It has been stressed in the implementation strategy that it is important to conduct induction sessions so that students can explore issues associated with mobile learning utilisation; the benefits and objectives, knowledge and skills required in the implementation. Awareness about the safety, security and ethical issues surrounding the use of mobile phones in education are also important to enable the students to apply the knowledge in practice. On-going support is also important to foster motivation throughout the implementation. The respondents agreed with the suggestions. The respondents also stressed the importance of the student's voice, which would provide the opportunity for the students to explain to the teachers regarding their interest to use latest technology such as mobile phones in learning activities. The respondents believe that this would help to raise positive attitude among teachers about the implementation. The finding fits in with the work of Vavoula *et al.* (2004) who highlighted the role of students as a promoter in integrating technology in education. Moreover, the respondents have proposed recommendation to encourage students to contribute in the pilot project to initiate a sense of ownership. This has been previously identified in the literature by Nielson and Web (2011) who draw attention to the importance of a pilot program in the implementation of mobile learning.

The importance of support for parents is also stressed in the implementation strategy which supports the opinion by Duncan (2009), about the significance of providing information to parents in ICT integration. The respondents suggest possible ways to ensure that parents are well-informed about the implementation to foster their support; through support documents or letters, school websites and special events such as information day, parents' evening, weekend meeting, Parents Teachers Association meeting, or school open day. The respondents also recommend including technical knowledge in the briefing sessions to help parents monitor their children. Finally, to foster parents' support, the respondents stressed

the importance in assuring parents that there will be minimal expenses in the implementation. This appears parallel to the literature by UNESCO (2012b) about the importance of encouraging parents' buy-in in implementing mobile learning.

The implementation strategy also highlighted the need to assume or assign specific roles, namely the English language subject leader, technical support staff (help desk) and students as a maintenance assistant to help the technical support staff (help desk). It has been proposed in the implementation strategy that the role of an English language subject leader is to coordinate the implementation of mobile learning in the English language subject and to provide on-going support to English language teachers in the implementation. The respondents agreed with the suggestion. Based on the studies undertaken by Pownell and Bailey (2001) and Pownell and Bailey (2003), technical support staff is also important. As a reflection to the respondents' perspectives, possible ways to allocate technical support staff at schools are: (1) allocating additional technical support staff; (2) using existing technical support staff; (3) sharing technical support staff between schools; and (4) appointing teachers as technical support staff. As suggested by the respondents, their roles will include: to conduct periodic checks and to perform early diagnoses for the broken facilities. Moreover, from the respondents' point of view, it is also possible to appoint students as maintenance assistant. With training, students are capable to provide assistance for technical support staff. Students can be selected from the computer clubs at non-Smart Schools and from the cyber brigades at Smart Schools among the students who are interested in the field of ICT. This can be seen as in line with the findings from Pownell and Bailey (2003), Apple Computer (2005), Gateway (2008) and Hsueh (2011).

The implementation strategy also stressed the importance to address the negative implications for students in using mobile phones in education. The first approach highlighted in the implementation strategy is to conduct induction sessions which is in line with the opinion by Williams (2006). Through induction sessions, students would have the awareness of safety, security and ethical issues surrounding the use of mobile phones in education which would help to address the issue of the negative implications on students. The respondents agreed with the suggestions. Another approach recommended in the implementation strategy is through the

Acceptable Use Policy (AUP), which was confirmed earlier by Bonifaz and Zucker (2004), Vahey and Crawford (2003), Ellie (2005), Attewell *et al.* (2010) and Hartnell-Young (2008). With the Acceptable Use Policy (AUP), students will be guided by rules to prevent issues associated with intentional and unintentional misuse of mobile technologies. The respondents were also positive with the suggestions. In addition, the respondents also recommended to safeguard students with practical countermeasures in addressing the issues of cyber bullying; to secure students' mobile phone numbers and encourage students not to share their number unnecessarily, to establish a clear protocol in assigning people who can access certain data or information, to set anonymous numbers for students to protect their privacy and to encourage schools to cooperate with police and private companies in addressing the issues of cyber bullying. This resonates with the study by Hinduja and Patching (2008), who explored the issue of cyber bullying through mobile phones and address the possible solutions.

**Technology:**

1.10) What is an effective implementation strategy in obtaining funding for the implementation?

1.11) What is an effective implementation strategy in enabling students to acquire mobile phones to be used in the implementation?

1.12) What is an effective implementation strategy in managing and maintaining the devices in the implementation?

With regard to the funding, the implementation strategy highlighted that the key strategy is to obtain contribution from the government. However, it would also be appropriate to encourage private companies such as mobile phone manufacturers and mobile network provider to contribute towards the implementation by providing easy-payment schemes. This suggestion supports the literatures which proposed the possibility of getting funding from the private companies (Williams, 2006; Siraj and Abdullah, 2005; Hsueh, 2011). Parallel to the literature by Mahamad *et al.*, (2008), the use of open source software might also be considered in implementing mobile learning. Moreover, as universities in Malaysia actively participated in mobile learning projects (Salam *et al.*, 2008; Mahamad *et al.*, 2008; Shiratuddin and Zaibon, 2009); therefore collaboration with local universities in developing mobile

content is also recommended. As it appears from the data analysis, the respondents agreed with the suggestions highlighted in the implementation strategy.

The implementation strategy also highlighted two schemes to support students to acquire mobile phones. These are known as Purchase Scheme and Loan Scheme. These schemes are based on the models by Vahey and Crawford (2002) and Williams (2006). For the Purchase Scheme, parents are encouraged to contribute towards the cost of the devices so that students will have the full ownership. The total cost of the mobile phones will be spread over five years, which is for the whole duration of secondary school education in Malaysia (from Form 1 to Form 5). With regard to the Loan Scheme, this model is formulated specifically for students who could not afford to purchase the devices. The parents and students are required to comply with the Loan Scheme Agreement which is to take proper care of the devices. The respondents agreed with these schemes. Instead of Loan Scheme Agreement, the respondents also recommended another viable approach which is by asking for some deposits for the loan devices. At the end of the year, deposits will be returned if there is no damage. In addition, for students who come from low-income family, the respondents also suggest to use Parents Teachers Association fees or student support fund to purchase mobile phones. Another alternative suggested by the respondents is to use students' own devices. This confirms previous research by Evans and Moss (2010) to encourage students to use their own devices in mobile learning implementation.

The importance to develop and establish procedures in order to manage and maintain the devices in technology integration was stressed by much research (Ellie, 2005; Hartnell-Young, 2008; Bonifaz and Zucker, 2004; Zucker, 2005 and McFarlene *et al.*, 2007). The implementation strategy highlighted possible procedures which include; keeping a systematic inventory of the devices, providing protective case, applying mobile theft solution and providing temporary supplies or loan stocks to students while waiting for the devices to be repaired. This was agreed by the respondents. As it appears from the respondents' point of view, additional approach are applying an acceptable use policy to discourage students from damaging the facilities, utilising basic mobile phones to make them less

attractive to thieves and providing opportunity to the students to customise their devices to boost sense of ownership. The respondents also suggest to apply password to the devices and to purchase insurance or additional warranty coverage which is parallel to the opinion by Pownell and Bailey (2003). In addition, the respondents also recommended raising student awareness through induction sessions so that students will be responsible towards the devices. This is in line with the opinion by Pownell and Bailey (2003).

Another research question explored in this study is associated with the issues in complementing the existing practises in Malaysian schools through the implementation of mobile learning. The research question is explored during the dissemination and distribution in Malaysia with the officers from a division under the Ministry of Education, Malaysia. The research question is:

**How can mobile learning complement the existing practices in Malaysian secondary schools?**

To answer this research question, four concepts are identified which are ICT policy, Malaysian Smart school initiative, English Language subject support and alternative technology. These concepts become the basis of the sub-questions:

***English Language subject support:***

2.1 How can mobile learning implementation add value to the existing initiatives in Malaysian schools in improving students command in English Language subject?

The analysis of the respondents' feedback gives an additional dimension to the potential to add value to the existing initiatives in improving English Language performance among Malaysian students. The respondents reported that the Ministry of Education, Malaysia has a plan to launch a project to utilise mobile phones to enhance a programme known as "Strengthening Malay Language, Enhancing English Language". The respondents also identified the affordances of mobile phones in supporting mobility and collaborative learning as well as providing an engaging and motivating learning environment which could contribute towards supporting English Language learning. This is supported by much research in language learning through mobile technologies including mobile phones by Dawson

(2007), Quinn (2000), Mellow (2005), Kenning (2008), Naismith *et al.* (2004) and Savill-Smith *et al.* (2006). The respondents also have shown a great attention to the use of multimedia elements via mobile phones such as games, graphic and animations in supporting English Language subject. This is supported by Salam *et al.* (2008).

**Malaysian schools' ICT policy:**

2.2 How can mobile learning complement the policy in the Malaysian Educational System to deploy ICT?

The analysis clearly shows that the respondents could see the potential of using mobile phones to complement the ICT policy in the Malaysian Educational System that encouraged the use of ICT in teaching and learning. The respondents indicated that the mobile phones could be used as a teaching and learning tool to support the ICT policy. Previously, Mahamad *et al.* (2010) highlight the potential of utilising mobile phones in Malaysian schools to increase the students' computer access ratio. The respondents provide an indication that mobile phones have the potential to be used in mainstream schooling in Malaysia as it is also an ICT device. The respondents also have positive views that mobile phones could also be used to access the Learning and Management System in Malaysian schools in the future. These opinions are parallel to the existing practices in Malaysian schools where television which is part of ICT device is also used as an educational resource (Abdullah, 2006). However, the respondents also stressed on the management of the mobile phones; to be used by upper secondary school students, who are believed to be more responsible and wiser in handling mobile phones. This approach has been applied in a mobile technology project in Terengganu State, Malaysia as highlighted by Intel (Intel World Ahead Program Official Website).

**Malaysia Smart School vision:**

2.3 How can mobile learning complement the Malaysian Smart School's vision to deploy mobile technologies?

In this research, it is clear that the respondents are positive with the use of mobile phones in complementing the Malaysian Smart School's vision to deploy mobile technologies. The respondents embrace the potential of utilising mobile phones to support the Malaysian Smart School's vision. The respondents reported that there was a plan to conduct a study in Malaysian Smart Schools to develop an e-content where mobile phones will be one of the ICT devices which are proposed to be used. The respondents implied that as the pioneer in ICT integration in education (The Malaysian Smart School Blue Print, 1997; The Smart School, 2005), mobile phones would be suitable to be used by the Malaysian Smart Schools' students for educational purpose. The respondents also reflected that the Malaysian Smart Schools are associated with the integration of technology in teaching and learning (The Malaysian Smart School Blue Print, 1997; The Smart School, 2005), which indicates that the use of mobile phones could bring an added value in complementing the Malaysian Smart School's vision. The respondents also have a vision that the mobile phones could support the Malaysian Smart Schools to prepare students with digital literacy and to become skilful workers for the 21<sup>st</sup> century. The literature by Hague and Williamson (2009b) support the recommendation that was given by the respondents about the potential of mobile phones to support digital literacy.

**Alternative learning and teaching approach:**

2.4 How can mobile learning become an alternative teaching and learning tool?

As it appears from the analysis, mobile phones have the prospect to become an alternative teaching and learning tool in Malaysian schools. This was established from the respondents' view in this study. This is reinforced by many research in the literature; Siraj (2004), Siraj and Saleh (2003), Mohd Nordin *et al.* (2010) and Abdullah and Siraj (2010b) about the potential of mobile phones to become an alternative teaching and learning tool in Malaysian schools. From the respondents' point of view, the proliferation of mobile phones in Malaysia, together with the affordances; supporting mobility, supporting communication between teachers and

students and supporting learning activities outside school hours could contribute towards the potential to utilise mobile phones as another mode of learning in Malaysian schools. This was supported by many researchers that identify the proliferation and the affordances of mobile phones (Malaysian Communications and Multimedia Commission, 2010; Mellow, 2005; UNESCO, 2012; Mifsud, 2002). The respondents also reported that the Ministry of Education, Malaysia has a plan to explore mobile phones in an educational project in the future. However, as highlighted by Pownell (2003), the respondents also recommended the importance of guidance and monitoring in addressing the issue of misuse among students so that mobile phones can be used effectively in Malaysian schools.

The final research question is associated with the emerging themes in the implementation of mobile learning in Malaysian schools. The research question is explored in the preliminary field tests, main field tests and the final stage of the study: dissemination and distribution. The research question is:

**What are the emerging themes in the implementation of mobile learning in Malaysian secondary schools?**

The study established that there are opportunities and challenges to implement mobile learning in Malaysian secondary schools. With regard to the opportunities, the analysis demonstrated that mobile phones are identified as a viable teaching and learning device to support English language subject in Malaysian secondary schools. The respondents identified the pedagogical affordances of mobile phones include; supplementing English subject outside classroom, supporting interactive learning, supporting drill and practice, encouraging systematic learning process, raising students' confidence and encouraging students to become autonomous learner. This was supported in much research about the pedagogical affordances of mobile phones in supporting English Language learning (Dawson, 2007; Quinn, 2000; Mellow, 2005; Kenning, 2008; Naismith *et al.*, 2004; Savill-Smith *et al.*, 2006, Attewell, 2005b).

As an affordable and a common device among students, there is also a possibility for utilising mobile phones in Malaysian schools. This was established in the study. The respondents were aware of the proliferation of mobile phones in Malaysia

which shows that mobile phones is a common device owned by most Malaysian people (Malaysian Communications and Multimedia Commission, 2010). The respondents stressed that there is a need to harness the proliferation of mobile phones to be explored in education which is parallel to the opinion by Brooks-Young (2010). In addition, the respondents also highlighted that it is inappropriate to discourage students from using mobile phones in educational activities because eventually it will become an ordinary tool for everyone, which is in accordance to the view by Prensky (2005).

Mobile phones are also perceived as an affordable tool which should be explored to support teaching and learning process in Malaysian schools. The respondents have the view that deploying mobile phones would be cost effective compared to desktop computers. The cost effective factor of mobile phones to be used in education was supported by Williams (2006), Motlik (2008), Hashemi and Ghasemi (2011). In addition, Siraj and Saleh (2008) highlighted that with the cost effective factor, there is an opportunity to utilise mobile phones in Malaysian schools.

It also appears in the study that mobile phones have the potential to become a teaching and learning tool in the future. The respondents indicated that there is a possibility of change in education; changes in the policy at school to realise the vision to implement mobile learning. The respondents predicted that mobile phones will be used in Malaysian schools within five to ten years. The findings appear to sum-up the consensus with the opinion by Read and Druin (2009) about the future of mobile phones in education. In addition, a study by Siraj and Saleh (2003) established the prediction that mobile phones or smart phones will be used in Malaysian schools at some point between 2016 and 2020.

The study also established that mobile phone is an engaging and motivational tool which could support teaching and learning in Malaysian schools. The respondents explain that with the element of fun in using mobile phones, it would encourage the students to be motivated to study. This is supported by Saran and Seferoglu (2010) and Kolb (2008) that mobile phones, which are popular among students, are motivational tools to be used in education and would be an effective approach in overcoming the difficulties faced by teachers and parents in motivating students.

Drawing from the findings established in this study, mobile phones are not only suitable to support English Language subject, mobile phones are also suitable to support other subjects and learning activities in Malaysian schools. The respondents identify the affordances of mobile phones in supporting various learning activities; as an alternative tool to support learning activities, as a medium of information, to support mobility, collaborative learning activities and interactive learning. This supported many studies which reinforce the affordances of mobile phones for educational purpose (Mifsud, 2002; Lan and Sie, 2010; Mellow, 2005; Boticki, Looi and Wong, 2011; Yang and Lin, 2010). Previously, Kolb (2008) successfully developed various learning activities conducted with mobile phones which have shown positive outcomes.

It is also apparent from the study that mobile phones could support to prepare Malaysian students with digital literacy. The respondents explained that the use of mobile phones could support the students to be prepared for their future career; the respondents believed that digital literacy is an important skill to acquire. This concurs with the opinion by Vavoula *et al.* (2009) who highlighted that the invaluable resources provided by mobile technology will become transferable skills in students' future career. In addition, the importance of raising competency in technologies has also been highlighted by the former Malaysian Minister of Education, Datuk Seri Hishammuddin Hussein (Goh and Aris, 2007). The findings also parallel to the literature by Hague and Williamson (2009b) about the potential of utilising mobile phones to prepare students with digital literacy to help them survive in their society.

However, there are challenges to implement mobile learning in Malaysia schools. This was also established in the study. In this research it is clear that one of the major challenges is to deal with misuse. The respondents explained that the issue of misuse would discourage the Malaysian government to support the use of mobile phones in education. The respondents highlight the possibility of misuse via MMS and Bluetooth. It is also possible that cyber bullying will occur through mobile phones. As the consequences, the issues will also increase teachers' workload to handle misuse. The respondents view implies that the issue of misuse with mobile phones in Malaysian schools would mirror the problems with E-book project in the

State of Terengganu, Malaysia where students had been found downloading indecent material and accessing malicious content through their E-books (Kosmo, 2009a). The concerns raised by the respondents also supported previous studies regarding the issue of misuse in using mobile technology and the reasons they are not welcomed by many schools even for use as an educational tool (Smith *et al.*, 2005; Trotter, 2001; Vahey and Crawford, 2002; Katz, 2005; Shaw, 2005; Rosile, 2007; The University of Alabama Computers and Applied Technology Program Official Website, 2006; Bauer and Ulrich, 2002; Clyde, 2004; Tatar *et al.*, 2003, Quinn, 2011).

The analysis of the gathered data has shown another issue; the policy in Malaysian schools which prohibit the use of mobile phones. Previously, the issue of the policy in schools worldwide was highlighted by Kolb (2008), Quinn (2011) and Pachler *et al.* (2010). The respondents explained that the policy which prohibits the use of mobile phones at schools could be a challenge to implement mobile learning. From 2009, mobile phones were prohibited in Malaysian schools because of misuse and discipline issues (Circulation Letter Number 2/2009). The respondents believe that only with changes in the policy, mobile learning could be implemented in Malaysian schools. This is parallel to the opinion by UNESCO (2012) about the hurdle in addressing current educational policy in implementing mobile learning. However, the respondents also predict that there is a possibility of change in the policy.

The analysis of the data clearly highlights the challenges associated with the management and maintenance to implement mobile learning in Malaysian schools. The respondents raised the issue of cost and the organisation of mobile learning. Other concerns are related to the management and maintenance is technical issues, theft, loss and health hazard as highlighted by Mifsud (2002), Mifsud (2003), Jackson (2002), Gimbert and Zembal-Saul (2002), Bauer and Ulrich (2002), Pownell and Bailey (2003) and Quinn (2011).

In addition, the study also established the issue about the stakeholders' attitude in Malaysia such as the community, students, teachers and parents. The respondents explained that there are challenges in the e-learning implementation in Malaysian schools (Ali, 2004) ; therefore, it is likely that Malaysian schools will face the similar

challenges in implementing mobile learning. In this research it is clear that there are challenges to address the stakeholders' attitude towards the use of mobile phones, ranges from community, students, teachers and parents. This was in line with the opinion by Read and Druin (2009), Pownell and Bailey (2003) and Vavoula *et al.* (2009) who stressed the resistance of change among stakeholders in integrating mobile technology in education including mobile phones. As a result of the data analysis, there is a challenge to address the Malaysian community. As explained by the respondents, the attitude of Malaysian community who has an inadequate sense of responsibility towards public facilities and inadequate interest in knowledge acquisition contributed towards the challenge in implementing mobile learning. It appears that there were studies about the community attitude towards mobile learning in some Asian countries (UNESCO, 2012b), but there is a gap of research about the Malaysian community. Hence, further research is recommended in the future.

Moreover, although there are studies which reveal positive attitude among students in utilising mobile learning (Traxler, 2008; Bradley and Holley, 2010; Mohamad, 2007), from the respondents' point of view, there will be challenges to raise the positive attitude in deploying mobile learning among the students who are less receptive towards changes in education and especially to the students in rural areas as highlighted by Kumar (2010). Parallel to the literature by UNESCO (2012b), the respondents stressed that it is possible that challenges will occur in addressing the students' anticipation towards mobile learning. The respondents also have a concern that students would be reluctant to commit to schedule to conduct learning activities through the mobile lessons and not be interested to deploy mobile learning because they are preoccupied with various co-curriculum activities and extra classes. The respondents were aware of the students' attitude; inadequate sense of responsibility towards loan items among Malaysian students which could become a challenge in implementing mobile learning. On the contrary, the respondents have a positive view that students will be interested in deploying mobile learning if they believe that it could bring advantages to them and relevant to their future as stressed by Eicker and Mathee (2008). There is much to be explored with regard to the issues of the Malaysian students' attitudes, and therefore further studies are needed in clarifying these issues.

Regarding the issue with teachers, there are studies which revealed teachers' acceptance towards mobile learning such as a study conducted by Stockwell (2008). However, the respondents explained that while Malaysian teachers would accept the use of mobile phones for educational purpose, it would be possible that a minority of them would show their resistance. The respondents' view implies that the challenges would be initiated from the teachers' concern that the implementation of mobile learning would bring extra workload to them; to learn new skills to deploy mobile learning and to monitor students to use the mobile phones productively as highlighted by Buabeng-Andoh (2012). On the other hand, the respondents were also positive that teachers would support the use of technology if it is necessary and relevant to them as stated in UNESCO (2012b). Similar to the students, there is also a need for further research to clarify the issues of Malaysian teachers' attitude.

In addition, as it appears from the analysis, there is also an issue with regard to the Malaysian parents' attitude. As a new educational technology, the respondents suggested that there is a need to address the issues with the parents' anticipation towards mobile learning especially among the parents in rural areas as highlighted by UNESCO (2012b). The parents' status as digital immigrants which was stressed by Prensky (2001), could imply that there are challenges in introducing mobile phones for educational purposes to the parents. The respondents have a concern that parents will be bemused by the idea of using mobile phones because they are accustomed to the notion of mobile phones as a communication tool as stated by UNESCO (2012b). The respondents also believed that parents would also be bemused with the changes in the policy as previous schools prohibited the use of mobile phones and parents would also concern with the expenses in deploying mobile learning. On the other hand, the study reflected the positive view among the respondents that the head teachers' reputation is a factor which could foster parents' support. The issue with regard to the Malaysian parents' attitude could represent a good idea to future research.

Moreover, as a consequence of the respondents' view, the study also established that the use of mobile phones in Malaysian schools may not only reduce the digital divide, but it may also lead to the digital divide. The respondents stressed the

importance to ensure that students have equity access to mobile phones to address the issue of the digital divide. The respondents explained that there is a possibility that the digital divide will occur resulting from the cost issue in acquiring mobile devices. This study agreed with the findings by Ariffin (2011) and Adesope *et al.* (2007) regarding the challenge to address the cost issue.

Finally, the analysis of the respondents' feedback established that using students' own mobile phones in the implementation of mobile learning in Malaysian schools could cause personal space invasion. The respondents stressed that students would expect that their mobile phones are personal things and they would be bemused with concepts of using their mobile phones for educational purposes. The respondents believe there are challenges to enforce the acceptable use policy to personal mobile phones, and to monitor students' own devices. With regard to this issue, the study mirrors the findings of Vavoula *et al.* (2009) about the challenges of utilising students' own device in the implementation of mobile learning.

### **Scope and limitation of the study**

This section discusses the concerns during the progress of the work which could or should have been addressed in a better way. The keywords are methodological approach, sample group and scope of the study.

There are ten steps involved in Educational Research and Development (ER&D) methodology which are research and information collecting, planning, developing preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, dissemination and distribution (Borg and Gall, 1979). As advised by Gall *et al.* (2007), a technique to apply Educational Research and Development (ER&D) methodology in a master's or doctoral degree is to limit in adapting just a few steps from the research methodology cycle because of the limitations in terms of finance, manpower and time. Previous studies by Isaacson (1980) as cited in (Borg and Gall, 1983), Pownell (2002) and Elliot (2007) have omitted some of the steps from the Educational Research and Development (ER&D) method. This study was conducted through eight steps instead of the ten steps from the Educational

Research and Development (ER&D) method, without conducting operational field tests and operational product revision. However, it would be worthwhile for the operational field stages to be conducted in the trial implementation in Malaysian schools in the future to obtain the students' perspectives. Future studies would enable the students to share their perspectives in formulating, evaluating and revising the implementation strategy to be used in the utilisation of mobile phones in Malaysian schools.

The main purpose of the study is to develop, evaluate and disseminate an implementation strategy for mobile learning utilisation to support English language vocabulary acquisition in Malaysian secondary schools. The informed teachers and officers in the Ministry of Education Malaysia are knowledgeable about the themes related to the study and could contribute towards policy development and other emerging issues. They are the most suitable people to be consulted and thus would be able to provide opinions or perspectives. However, a study by Vavoula *et al.* (2004) stressed the significance of students' voice in the integration of technology in education. In this case, the students may have an opinion about the suitability of mobile lessons to help them acquire English vocabulary, but they would not necessarily have the knowledge in the field of policy development, or the understanding of the social, ethical and pedagogic issues. However, as explained in the previous paragraph, further studies which include the operational stages would enable the students to participate in a future study.

With regard to transferability, this study draws on empirical evidence from both the United Kingdom and Malaysia's respondents, to gain a better, more international perspective. The commonality of these respondents is that they are based from the same level of institutions, which are secondary schools. In addition, similar to the respondents in Malaysia, the respondents in the United Kingdom are based from a country which have well-established interest and emphasis on the use of ICT in education. They are well-informed about the utilisation of mobile technologies in mainstream education. They are also reflecting upon the social, ethical and pedagogical issues of the use of mobile phones in education. Their opinion provides initial findings which are further examined in the context of Malaysian schools in the main field tests.

With regard to the implementation strategy, it concentrates on the development of the implementation strategy to support English Language learning; a compulsory and an important subject in Malaysian schools which needs attention. Ideally, mobile learning ought to be introduced to all subjects to gather the full benefits of the implementation. The development of the implementation strategy to support Science and Mathematics would also be useful. There were studies of Malaysian scholars who developed mobile applications to support Science and Mathematics (Mahamad *et al.*, 2010; Dewitt and Siraj, 2010). However, with regard to the implementation strategy, concentration was given to the English Language subject to add value to the numerous efforts by the Ministry of Education, Malaysia in improving students' command in English Language. Nonetheless, the implementation strategy developed in the study might be tailored and customised to complement the development of the mobile applications for Science and Mathematics by the Malaysian scholars. The implementation strategy might also be tailored and customised to support other subjects in the Malaysian secondary schools.

This study established the perspectives gathered from the preliminary field tests, the main field tests and the final stage of the study: dissemination and distribution. In the preliminary field tests, opinions were gathered from 4 schools in the United Kingdom. It was a small sample, but representative of schools with a positive attitude to curriculum development and ICT integration. They are identified from different backgrounds; small town schools and urban schools. In the main field tests, opinions were gathered from 9 schools in Malaysia. It was also a small sample, but identified from different backgrounds of schools in Malaysia; Smart School and non-Smart School. Finally, in the dissemination and distribution, 5 officers are identified from a division in the Ministry of Education, Malaysia. It was a small sample, but representative of various sectors from the division which ensured wider influence of perspectives.

The study might also have limitation through researcher bias. In this study, the researcher is also the interviewer in the data collection which could cause problems. However, this was avoided by ensuring that the interview schedule is the basis of the field tests to ensure the reliability of the study. Moreover, in the

production of the implementation strategy, there was a limited scrutiny of perspectives from the whole handbook by individual respondents. The study focused on the important topics based on the literature review (Pownell and Bailey, 2003; Williams, 2006) to be evaluated by the respondents.

### **Implication of the study and future research**

Conducting the study has been a rewarding and satisfying experience. Through the Educational Research and Development (ER&D) method, an implementation strategy for the implementation of mobile learning has been developed. The implementation strategy is validated and modified as a result of the consultation from the range of experts in education through the preliminary field tests and main field tests. The implementation strategy was then distributed and disseminated to the officers in the Ministry of Education, Malaysia. It has been confirmed by these officers that the implementation strategy would have the potential to provide guidance in the implementation of mobile learning in Malaysian schools.

This study has established the potential of utilising mobile phones in education to complement the existing practices in Malaysian schools. Drawing from the findings, mobile phones may have implications in the following areas: (1) adding value to the existing initiatives for English Language subject in Malaysian schools; (2) complementing the ICT policy in the Malaysian Educational System; (3) complementing the Malaysian Smart School's vision to utilise mobile technologies; and (4) providing an alternative teaching and learning tool in Malaysian schools.

Moreover, this study also has explored the emerging themes in the implementation of mobile learning. There are opportunities and challenges to utilise mobile phones in Malaysian schools. The study established that Malaysian secondary schools would have the opportunity to implement mobile learning through mobile phones. This is based on the following key points: (1) mobile phones as a viable teaching and learning tool to support the English subject; (2) mobile phones as an affordable tool; (3) mobile phones as a common device among students; (4) mobile phones as a tool to be used in mainstream education in the future; (5) mobile phone as an engaging and motivational tool; (6) mobile phones as a tool to support various learning activities; and (7) mobile phone as a tool to prepare students for their

future. However, to implement mobile learning, there are challenges which need to be addressed. These relate to the following key issues: (1) misuse; (2) current educational policy; (3) management and maintenance; (4) stakeholders' attitude; (5) digital divide; and (6) personal space invasion.

Nevertheless, there are solutions to address these challenges. Besides the solutions which were highlighted in the implementation strategy, there are additional strategies established. As it appears from the analysis, there is a need to introduce mobile learning gradually, from one level to another as a key to smooth mobile learning implementation. This is parallel to the opinion by Hartnell-Young and Heym (2008) that mobile phones are expected to be deployed gradually until they are accepted as a common learning tool. The study also established that in the beginning, it is a sensible action to introduce mobile learning to upper secondary school students who are wiser and more responsible in using mobile phones compared to lower secondary school students. This is supported by previous e-book implementation in the state of Terengganu, Malaysia, where the schools applied similar approach; by introducing the use of e-book to Year 5 students in primary schools before introducing it to younger students (Intel World Ahead Program Official Website). The respondents also suggest using a specific type of mobile phones equipped with parental features to address the issue of negative implication on students which is parallel to the suggestion by Roberson and Hagevik (2008). Moreover, the respondents' view implies that as part of learning institutions which are familiar with technology and emphasised the use of ICT, it would be appropriate to introduce mobile learning for Smart School students, who are familiar with the use of technology in education. This is supported by the literatures which highlight the use of technology in Malaysian Smart Schools (The Malaysian Smart School Blue Print, 1997; The Smart School, 2005). In addition, the respondents also recommended encouraging the use of mobile phones as an optional learning tool in non-Smart School students and for students who are interested to deploy mobile learning. It is clear from this study that the respondents have a positive opinion about the use of mobile phones as highlighted in the literature by Kolb (2008) and Hartnell-Young (2008). There are also studies about the positive attitude among students in Malaysia towards mobile learning (Mohamad, 2007; Mahadi, 2005, UNESCO, 2012c). On the contrary, there are

negative perceptions of the use of mobile phones in education in the aspect of distraction, delinquency and chicanery (Smith *et al.*, 2005; Trotter, 2001; Vahey and Crawford, 2002; Katz, 2005; Shaw, 2005). Hence, further study is recommended in establishing the feasibility to use mobile phones in these schools and for these groups of students.

The previous paragraphs established the contribution of this study. The study does not only add value to the existing knowledge associated with mobile learning area in Malaysia, it also opens up a new direction for future research. The following are the potential key research issues:

- (i) A trial project in the Malaysian Smart Schools and non-Smart Schools is recommended to utilise the implementation strategy developed in the study. Future studies would enable the students to provide their perspectives in formulating, evaluating and revising the implementation strategy to be used in the utilisation of mobile phones in Malaysian schools.
- (ii) As some of the revisions of the implementation strategy are made solely by the respondents' perspectives, it would be beneficial to conduct a trial implementation in Malaysian schools to gain further perspectives. Moreover, further study is also recommended in establishing the feasibility to use mobile phones in these schools and for these groups of students.
- (iii) The study explored the issues related to stakeholders; teachers, parents, students and the communities in implementing mobile learning. However, the area of mobile learning in Malaysia would benefit from further research in clarifying these issues.
- (iv) To explore other stakeholders' perspectives about the emerging issues in implementing mobile learning in Malaysia: As this study concentrates on the emerging issues raised by educational experts in the secondary schools and the officers from the Ministry of Education,

Malaysia, it is also worthwhile to explore the perspectives from other stakeholders in Malaysia such as students, parents and the communities.

- (v) To explore the stakeholders' perspective in other countries with regard to the emerging issues in implementing mobile learning: It might be worthwhile to explore the perspectives of all stakeholders in other countries such as teachers, parents, students, communities and the authorities.
- (vi) The development of the implementation strategy to support other subjects in the Malaysian curriculum: The process of developing the implementation strategy might be applied to other subjects in the Malaysian curriculum. The same process using the same method might be applied to develop the implementation strategy.
- (vii) The development of the implementation strategy to support other subjects in other countries: The process of developing the implementation strategy might be applied to other subjects in other countries. The same process using the same method might be applied to develop the implementation strategy.
- (viii) To explore the use of mobile phones in addressing the issue of social justice and inclusion in education: Mobile technologies such as mobile phones can benefit students who lack motivation to learn, who are not organised or who have conflicting pressures. Mobile phones could enhance accessibility and inclusion. It is worthwhile to explore how far the utilisation of the device can address these issues.

These are the potential key research issues to be explored. They will not only contribute towards understanding the situation of mobile learning in Malaysia, it might also add value to the mobile learning situation in other countries. The study provides the opportunity to the researcher to contribute towards mobile learning knowledge in Malaysia. From the research point of view, although the Malaysian

schools have the potential to implement mobile learning, various challenges need to be addressed in making it a reality. However, the solutions for the challenges were also established in this study. It is envisaged that the implementation strategy developed in this study would help towards the realisation of the implementation of mobile learning in Malaysian secondary schools. Even though mobile learning is still in its infancy, but with continuous study, the researcher believed that one day mobile learning will become an ordinary learning environment in Malaysian schools.

A handwritten signature in black ink, appearing to be 'J. Saad' or similar, written in a cursive style.

November 2012

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## Appendices



**Appendix A: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Preliminary Field Tests)**



**Mobile Learning  
in  
English Language Learning:  
An implementation strategy for  
secondary schools in Malaysia**

**Preliminary Field Tests**

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# Contents

Preface	ii
<b>Part 1 : Mobile technology integration into the curriculum</b>	
1.1 Mobile lessons	1
1.2 Resourcing mobile learning	5
<b>Part 2: Policy &amp; procedure of implementing mobile learning at school</b>	
2.1 Ownership model	8
2.2 Acceptable use policy	9
2.3 Management and maintenance	10
2.4 Specific roles for supporting mobile learning	11
2.5 Support for major stakeholders	12
<b>Bibliography</b>	
Part 1: Mobile technology integration into the curriculum	14
Part 2: Policy & procedure of implementing mobile learning at school	15

## Preface

To support the deployment of mobile technology for English Language learning in secondary schools, there is a need to formulate an implementation strategy in order to ensure the success of the implementation. This implementation strategy is formulated by taking into consideration the following matters:-

Existing policy by Ministry of Education Malaysia to employ ICT in teaching and learning

Goals of Malaysian Smart Schools implementation to employ ICT which also includes mobile technologies.

Justification from the academic literatures related to mobile technology integration in schools.

Opinion from educational experts in the United Kingdom; English Language subject leaders, ICT coordinators and headteachers.

Opinion from educational experts in Malaysia; English Language subject leaders, ICT coordinators, school principals, and policy makers from the Ministry Of Education, Malaysia.

Objectives of this document:

To propose a strategy for the implementation of mobile learning for English Language learning in Malaysian schools in the future.

To be used not only by Malaysia, but other countries which are considering to adopt mobile technologies in general and mobile phones specifically in teaching and learning.

This document is divided into two parts:-

Part 1: Mobile technology integration into the curriculum. It will consist of the overview of the suggested mobile lessons and infrastructure related.

Part 2: Policy & procedure of implementing mobile learning at school. It will consist of the policy and procedure related to the implementation.

- ***Part 1 : Mobile technology integration into the curriculum***



### **1.1 Mobile lessons**

*This component includes suggestions regarding the content and structure of mobile lessons.*

- In the beginning, the English Language subject will be the pioneer in using mobile technology. In time, other subjects might adopt mobile technology as their learning tools.
- A suggestion has been made to introduce mobile lessons through Short Message Service (SMS) which consist of vocabulary introduction and explanation, vocabulary review through multiple choice question and feedback mechanism.
- The objective of the mobile lessons is to provide interactive learning activities which will support vocabulary acquisition for secondary school students in improving their command of English Language.
- The lesson will conform to the syllabus provided by Ministry of Education Malaysia and will be used as a supplement to support teaching and learning.
- A list of vocabulary which is appropriate for the use of secondary school students from Form 1 to Form 5 will be employed and can be obtained from the Syllabus and Curriculum Specification of the Curriculum Development Centre, Ministry of Education Malaysia (<http://www.ppk.kpm.my/>). It is also suggested to include additional vocabularies from other sources to widen students' knowledge.
- There will be four sections in the lessons:
  - a) Introducing vocabulary (pronunciation and meaning in Malay Language)
  - b) Explaining the usage of the vocabulary
  - c) Reviewing the vocabulary through multiple choice question
  - d) Feedback mechanism

As an example, a word “ABSOLUTELY” from the list is taken from the syllabus. The sections for this word are as below:

- a) Introducing vocabulary (pronunciation and meaning in Malay Language)

## ABSOLUTELY

Pronounce as (absolutli)  
meaning: benar-benar, betul-betul

b) Explaining the usage of the vocabulary

Examples:

1. She is absolutely beautiful.
2. Your writing is absolutely fine.

c) Reviewing the vocabulary through multiple choice question

Quiz 1:

Which one of the following is the right usage for the word ***absolutely***?

- A. Wow! The clothes are only RM2. The price is absolutely fantastic.
- B. I am not sure whether I will join you tomorrow or not. In other words, I am absolutely certain.
- C. The result will not be released before the end of the month. Absolutely we will get the result in the middle of the month.
- D. You have to take your medicine now. You look absolutely fine.

(Correct answer: A)

d) Feedback mechanism

Students send SMS containing answers for quizzes directly to teachers number (computer server). An automatic feedback from teachers number (computer server) will be delivered to students providing the answer and explanation.

For example: Students will type: **Q1: A to number 8888.**

Students will receive: **Your answer is correct. A is the correct answer because.....**

- The delivery of the mobile lessons will be conducted during out of school hours. It will be scheduled accordingly so that it will be parallel to the lesson plan at schools.
- The lessons will be delivered three times a week, at 8 pm on Monday, Wednesday and Friday.
- Each time the mobile lessons are delivered, three new words will be introduced to students. Thus, students will learn nine new words every week.

- It is also suggested that monthly quizzes should be conducted through mobile learning to enable students to revise the words which have been learned.
- Teachers will monitor students' progress via the Students Progress Tracking System. The following figure illustrates the overview of the system:

**Student progress tracking system**

LOG OUT

**Mobile Vocabulary**



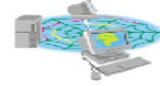
Username:  
mm506

Password:  
\*\*\*\*\*

STUDENT MOBILE NUMBER	STUDENT NAME	PROGRESS TRACKING
		<i>View Performance</i>

- To make vocabulary learning more effective, it is also suggested to integrate the vocabularies which have been learned through mobile lessons into other learning activities at school such as listening, speaking, reading and writing.
- It is also suggested that the delivery of mobile lessons should be customised according to students' level of performance to ensure the appropriateness and the effectiveness of the mobile lessons for every student.
- To make the mobile lessons more interesting, it is also suggested to apply multimedia elements through Multimedia Messaging Service (MMS).
- The benefits of implementing mobile learning in vocabulary learning are the following:
  - (i) As a suitable medium for repetition or drill and practice for memory retention.
  - (ii) Mobile technologies through SMS have an advantage as “push” technologies which can encourage students to have regular study times and to be motivated to conduct their learning activity.
  - (iii) As an interactive learning activity where questions are sent out and answered to receive immediate feedback.
  - (iv) Enable students to become more autonomous learners and able to monitor their own progress.
  - (v) The bite size lesson is suitable for hectic live for students today. Mobile technology can assist vocabulary learning by providing learners with bite size lessons that they can assimilate in a limited time available.
  - (vi) As a study aid to uniquely support English vocabulary learning.
  - (vii) It can support personalisation through customising the lessons according to students' level of performance.

- (viii) Learning through mobile learning is engaging and motivating.
- (ix) As an alternative to flash cards.
- (x) Mobile devices are cost effective and might reduce costs in comparison to other computing devices such as networked computers.
- (xi) Among language learning projects with mobile technology, learning vocabulary is the most popular course after listening course.
- (xii) As a formative assessment mechanism.
- (xiii) As a blended learning tool.

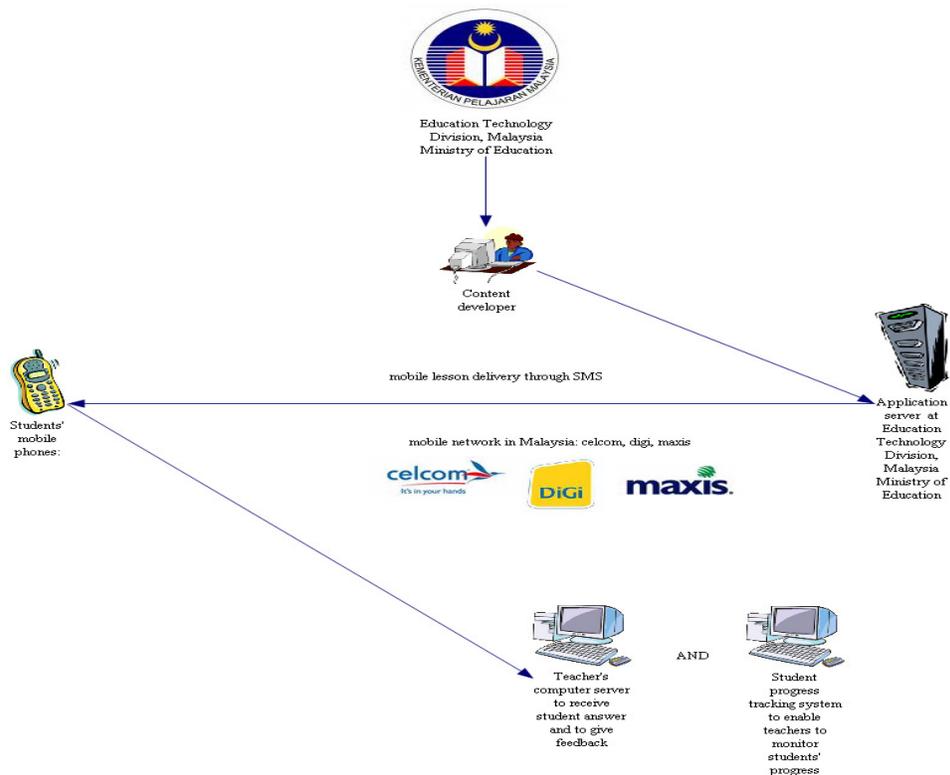


## 1.2 Resourcing mobile learning

*This component includes suggestions regarding the facilities needed for mobile learning implementation.*

- To implement mobile learning in schools, there is a need to consider the following costs: (i) mobile content development (ii) application server to deliver mobile lessons (iii) mobile devices (iv) mobile network (v) teachers' computer server (vi) student progress tracking systems. This is shown in the following figure which is suggested as the system architecture in the implementation.

Mobile learning management system



- It is expected that the government will support the cost of hardware which are application server to deliver mobile lessons, teachers' computer server, student progress tracking systems as well as the cost of mobile devices.
- However, if there is a need to distribute the cost of purchasing the mobile devices with parents and students, feasible option is to include a scheme which will be proposed to enable parents to purchase these devices for their children. This will be explained further in Part 2: 2.1 Ownership model, page 8.

- Affordable mobile phones will be suggested to be used in this implementation. The feature that the proposed mobile phones should have is SMS technology to support the delivery of mobile lesson. The following figure showed current mobile phone models which are affordable and can be considered for the implementation (retrieved from myphone.com.my dated 27th January 2009):

i) Nokia 1680 priced at RM200 (equivalent to £40)



### FEATURES

Features  
 Messaging SMS, MMS, Email, Instant Messaging  
 Browser WAP 2.0/xHTML  
 Games Yes  
 Colours Black, Slate Gray, Wine Red, Deep Plum  
 Camera VGA, 640x480 pixels, video  
 - Nokia Xpress Audio Messaging  
 - Calendar  
 - Calculator  
 - Voice memo  
 - Built-in handsfree  
 - English-Chinese dictionary

ii) Sony T250 priced at RM205 (equivalent to £40)



### FEATURES

Features  
 Messaging SMS, MMS  
 Browser WAP 1.2.1  
 Games Yes  
 Colours Aluminium Silver, Aluminium Black  
 Camera VGA, 640x480 pixels  
 - FM radio with RDS  
 - Slide show  
 - Full screen viewer  
 - T9  
 - Stopwatch  
 - Timer  
 - Built-in handsfree

- The government might consider to cooperate with mobile phone providers by offering incentives for them for their contribution towards Malaysia Education System.
- As mobile devices will become less expensive, another type of mobile devices such as smart phones which offer similar functions might be considered in the future.
- Regarding the cost for developing content, there is a company in Malaysia which already step ahead in producing mobile lessons. This company is known as LTT Global Communication. The government might consider to cooperate with this company by offering incentives for the contribution towards Malaysia Education System. Open source software might also be considered to be used.
- The cost for providing a mobile network might be shared with network providers in Malaysia which are Digi, Celcom and Maxis. These companies should be encouraged to contribute in this implementation by offering incentives to them.
- The aforementioned suggestions will ensure that the proposed infrastructures are affordable, practical and feasible for the implementation.

- ***Part 2: Policy & procedure of implementing mobile learning at school***



### **2.1 Ownership model**

*This component includes suggestions regarding the strategy which will be applied to enable all students have equity access to mobile devices.*

- In order to provide opportunities for all students to acquire mobile devices for learning there will be two options:
  - 1) Ownership - students and parents will pay for the devices. The total cost of the mobile devices will be separated over five years, which is for the whole duration in secondary schools (from Form 1 to Form 5). Students will get full ownership of the devices. The Financial Responsibility Agreement will be signed by parents and students indicating:
    - (i) Purchase Scheme which will indicate monthly or annual instalments which needs to be paid.
    - (ii) Other payments that may incur. For example, payment for insurance, additional warranty coverage for the device, accidental damage protection and payment to repair the devices.
  - 2) Loanership - students will loan the devices. This model is proposed especially to students who are unable to purchase the devices. It is similar to the procedure in “Text Book Loan Scheme” which is being implemented in Malaysian schools. In this model, Loanership Agreement will be signed by parents and students indicating their responsibilities towards the devices:
    - (i) To take good care for the devices
    - (ii) To pay for the damage or lost of the devices
    - (iii) To return the devices in good working condition to school during school holidays and when they transfer to another school.
- The aforementioned suggestions will ensure that all students will have the opportunities to acquire mobile devices in spite of their financial situations and to lessen the financial burden of parents.



## **2.2 Acceptable use policy**

*This component includes suggestions regarding the regulation which needs to be adhered by students in using mobile technologies for learning.*

- To prevent and to eliminate problems associated with intentional and unintentional misuse of mobile technologies, an acceptable use policy should be established.
- In the acceptable use policy, parents and students will be informed regarding the inappropriate behaviour pertaining to the use of the devices.
- Inappropriate behaviour may include:-
  - 1) Sending malicious contents or messages to other people
  - 2) Sending abusive or harassing messages to other people
  - 3) Installing unauthorised programs (for devices which are being loaned)
  - 4) Vandalising or stealing data/devices
  - 5) Accessing illegal or inappropriate content
  - 6) Using devices in an inappropriate manner which will lead to damage
  - 7) Other undefined inappropriate behaviour that may arise as implementation takes place
- In the acceptable use policy, parents and students will also be informed of the consequences of misconduct.
- Consequences of misconduct may include:-
  - 1) Verbal warning
  - 2) Official warning
  - 3) Caning
  - 4) School suspension
  - 5) School expulsion
- Parents and students will sign a Consent and Waiver Form to indicate that they have understood the content of the acceptable use policy.
- The aforementioned suggestions will prevent and eliminate the implications of improper use of mobile technologies.



### **2.3 Management and maintenance**

*This component includes suggestions regarding the strategies which will be applied in managing and maintaining the equipment.*

- To implement mobile learning, there is a need to develop procedures for the management and maintenance of the equipment.
- The procedures are as the following:
  - i) All devices which will be loaned to students should be marked with serial numbers as well as school's name and ID code or bar code.
  - ii) The school should keep a systematic inventory of the devices for easy identification. This is useful so that the devices can be returned to its owner in the event of lost or misplaced.
  - iii) All devices should be provided with protective cases to give appropriate protection and to help reducing the occurrence of breakage.
  - iv) It is also beneficial to consider adopting an asset management mechanism such as mobile devices tracking systems, which will track and recover stolen or missing mobile devices.
  - v) In order to ensure that learning activities will not be interrupted while the devices are sent for repair, school should provide temporary supplies or loan stocks to students.
  - vi) The school should also need to determine where to send the devices for repair in case of faults.
- The aforementioned suggestions will ensure effective management and maintenance of mobile devices and to eliminate lost, damage, theft, misplaced and other unwanted occurrences.



## 2.4 Specific roles for supporting mobile learning at school

*This component includes suggestions regarding the specific roles needed for the implementation.*

- To implement mobile learning, there is a need to assume or assign specific roles which are English language subject leaders, ICT coordinator and technical support staff.
- The roles of an English language subject leader are as the following:
  - i) To coordinate mobile learning implementation.
  - ii) To ensure that English language teachers will conduct mobile learning according to the structure and syllabus as instructed by the Ministry of Education Malaysia.
  - iii) To monitor and evaluate students' progress.
  - iv) To audit and to inform to school principals regarding the progress of the implementation.
  - v) To encourage and provide on-going support to English language teachers throughout the implementation.
- The roles of an ICT coordinator are as the following:
  - i) To coordinate the management and maintenance of technology deployment.
  - ii) To liaise with the Educational Technology Department, Ministry of Education Malaysia regarding technology deployment.
  - iii) To inform to school principals regarding the technical issues in the implementation
  - iv) To supervise technical support staff.
- The roles of a technical support staff are as the following:
  - i) To perform comprehensive management and maintenance of all facilities related to the implementation.
  - ii) To report any technical problems to ICT coordinator.
  - iii) To provide on-going support to English language teachers and students throughout the implementation.
- The aforementioned suggestions will ensure that there will be comprehensive support in the implementation.



## 2.5 Support for major stakeholders

*This component includes suggestions regarding the support which will be given to the major stakeholders in the implementation*

- To implement mobile learning, there is a need to provide comprehensive support to teachers, students and parents.
- For teachers:
  - i) Although teachers are familiar with mobile devices, professional development for teachers is still necessary.
  - ii) Teachers will be given comprehensive induction sessions regarding the benefit and objective of the implementation, as well as hands-on professional learning regarding the knowledge and skills required for mobile technology utilisation.
  - i) Teachers will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to apply that understanding in practice.
  - iii) Teachers will be given on-going support which will foster motivation throughout the implementation.
  - iv) Teachers will be given sufficient time to explore and familiarise themselves with new devices before the implementation.
  - v) Partnership with local universities, education organisations and other institutions are also encouraged so that schools will be able to gain expertise and assistance for training purpose.
- The aforementioned suggestions will ensure that teachers will be well-informed regarding the objective of mobile learning, become familiar with the technology and confidence to use it, which will finally initiate positive attitude towards the implementation.
- For students:
  - i) Students will be given comprehensive induction sessions regarding the benefit and objective of the implementation, knowledge and skills required for mobile technology utilisation.
  - ii) Students will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to apply that understanding in practice.
  - iii) Students will be given on-going support which will foster motivation throughout the implementation.
- The aforementioned suggestions will ensure that students will be well-informed regarding the objective of mobile learning, become familiar with the technology and confidence to use it, which will finally initiate positive attitude towards the implementation.
- The suggestions are also proposed to eliminate negative implications of mobile technologies towards students and to promote productive use of the devices.

- For parents:
  - i) Parents will be given comprehensive briefing sessions regarding the benefit and objective of the implementation, role of parents as stakeholders in the implementation, as well as procedures and policies related.
  - ii) Parents will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to monitor their children to use mobile devices productively and to eliminate negative implications of mobile technologies towards their children.
  - iii) Parents will be informed about the progress of their children in the utilisation of the devices from time to time.
- The aforementioned suggestions will ensure that parents will be well-informed regarding the objective of mobile learning, initiate positive attitude and to encourage parent involvement in students' learning.

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## Part 2: Policy & procedure of implementing mobile learning at school

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**Appendix B: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Main Field Tests)**



# **Mobile Learning in English Language Learning: An implementation strategy for secondary schools in Malaysia**

## **Main Field Tests**

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# Contents

Preface	ii
<b>Part 1 : Mobile technology integration into the curriculum</b>	
1.1 Mobile lessons	1
1.2 Resourcing mobile learning	5
<b>Part 2: Policy &amp; procedure of implementing mobile learning at school</b>	
2.1 Ownership model	8
2.2 Acceptable use policy	9
2.3 Management and maintenance	10
2.4 Specific roles for supporting mobile learning	11
2.5 Support for major stakeholders	12
<b>Bibliography</b>	
Part 1: Mobile technology integration into the curriculum	14
Part 2: Policy & procedure of implementing mobile learning at school	15

## Preface

*A suggestion has been made to produce an implementation strategy in introducing English vocabulary learning through mobile phones to improve students' command of the English language in Malaysian secondary schools and as an alternative way in using affordable technologies for teaching and learning. The need for the research was based on the rise of mobile learning interests in Malaysia but the non-existence of a guideline towards the implementation in Malaysian schools, specifically.*

The implementation strategy is formulated by taking into consideration the following matters:-

Existing policy by Ministry of Education Malaysia to employ ICT in teaching and learning

Vision of Malaysian Smart Schools implementation to employ ICT which also includes mobile technologies.

Justification from the academic literatures related to mobile technology integration in schools.

Opinion from educational experts in the United Kingdom; English Language subject leaders, ICT subject leaders and head teachers.

Opinion from educational experts in Malaysia; English Language subject leaders, ICT subject leaders, school principals, and policy makers from the Ministry Of Education, Malaysia.

Objectives of this document:

To propose a strategy for the implementation of mobile learning for English Language learning in Malaysian schools in the future.

To be used not only by Malaysia, but other countries which are considering to adopt mobile technologies in general and mobile phones specifically in teaching and learning.

This document is divided into two parts:-

Part 1: Mobile technology integration into the curriculum. It will consist of the overview of the suggested mobile lessons and infrastructure related.

Part 2: Policy & procedure of implementing mobile learning at school. It will consist of the policy and procedure related to the implementation.

- ***Part 1 : Mobile technology integration into the curriculum***



### **1.1 Mobile lessons**

This component includes suggestions regarding the content and structure of the mobile lessons.

- In the beginning, mobile technology will be used in the English Language subject. In time, other subjects might adopt mobile technology as their learning tools.
- A suggestion has been made to introduce mobile lessons through Short Message Service (SMS), which consists of vocabulary introduction and explanation, vocabulary review through multiple-choice questions and feedback mechanism.
- *The design of the mobile lessons will replicate previous projects in vocabulary learning through mobile phones. One of it is SMS-ME ENGLISH from LTT Global Communication, Malaysia. Another application, which has been studied, is Vidiom, which delivers visual explanation of English idioms. The mobile lessons are also based on the initiative of Learning Italian via SMS, an application which supports learning Italian and uses SMS as the medium to deliver vocabulary.*
- The objective of the mobile lessons is to provide interactive learning activity, which will support vocabulary acquisition for secondary school students in improving their command of English Language.
- The lesson will conform to the syllabus provided by Ministry of Education Malaysia and will be used as a supplement to support teaching and learning.
- A list of vocabulary which is appropriate for the use of secondary school students from Form 1 to Form 5 will be employed and will be obtained from the Syllabus and Curriculum Specification of the Curriculum Development Centre, Ministry of Education Malaysia (<http://www.ppk.kpm.my/>). It is also suggested to include additional vocabulary from other sources to widen students' knowledge.
- There will be four sections in the lessons:
  - e) Introducing vocabulary (pronunciation and meaning in Malay Language)
  - f) Showing the usage of the vocabulary
  - g) Reviewing the vocabulary through multiple choice question
  - h) Feedback mechanism

As an example, a word “DESPAIR” is taken from the syllabus. The sections are as the following:

a) *Introducing vocabulary (pronunciation and meaning in Malay Language)*

*DESPAIR*

*Pronounce as (disper)  
meaning: putus asa, hilang harapan*

b) *Showing the usage of the vocabulary*

*Examples:*

- 1. They were rescued from despair at the last minute.*
- 2. Too often the first despairing thought is, “Who will want me now?”*

c) *Reviewing the vocabulary through multiple choice question*

*Quiz 1:*

*Which one of the following is not the right usage for the word **despair**?*

- A. They moaned in despair and dismay.*
- B. One harsh word would send her into the depths of despair.*
- C. He was filled with despair at the bad news.*
- D. Please despair, help is on the way!*

*(Correct answer: D)*

d) *Feedback mechanism*

*Students send SMS containing answers for quizzes directly to teachers' number (computer server). An automatic feedback from a teachers' number (computer server) will be delivered to students providing the answer and explanation.*

*For example: Students will type: **Q1: D to number 8888.***

*Students will receive: **Your answer is correct. D is the correct answer because.....***

- The delivery of the mobile lessons will be conducted during out of school hours. It will be scheduled accordingly so that it will be parallel to the lesson plan at schools.*
- The lessons will be delivered according to secondary school sessions. The mobile lessons are suggested to be delivered three times a week, at 8 pm on Monday, Wednesday and Friday for morning sessions students and at 8 am on Monday, Wednesday and Friday for afternoon sessions students.*

- Each time mobile lessons is delivered, six same new words will be introduced to students. This is to ensure that all students repeat and revise the words.
- It is also suggested that monthly quizzes should be conducted through mobile learning to enable students to revise the words, which have been learned.
- Teachers will monitor students' progress via the Students Progress Tracking System. The following figure illustrates the overview of the system:

**Student progress tracking system**

LOG OUT

**Mobile Vocabulary**



Username:  
\_\_\_\_\_

mm506

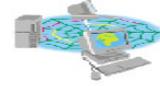
Password:  
\_\_\_\_\_

\*\*\*\*\*

STUDENT MOBILE NUMBER	STUDENT NAME	PROGRESS TRACKING
		<a href="#">View Performance</a>

- To make vocabulary learning more effective, it is also suggested to integrate the vocabularies, which have been learned through mobile lessons into other learning activities at school such as listening, speaking, reading and writing.
- It is also suggested that the delivery of mobile lessons should be customised according to students' level of performance to ensure the appropriateness and the effectiveness of the mobile lessons for every student.
- To make the mobile lessons more interesting, it is also suggested to apply multimedia elements through Multimedia Messaging Service (MMS).
- The benefits of implementing mobile learning in vocabulary learning are as the following:
  - (xiv) As a suitable medium for repetition or drill and practice for memory retention.
  - (xv) Mobile technologies through SMS have an advantage as “push” technologies, which can encourage students to have regular study times and be motivated to conduct their learning activity.
  - (xvi) As an interactive learning activity where questions are sent out and answered to receive immediate feedback.
  - (xvii) Enable students to become more autonomous learners and able to monitor their own progress *without over depending on the teachers*.

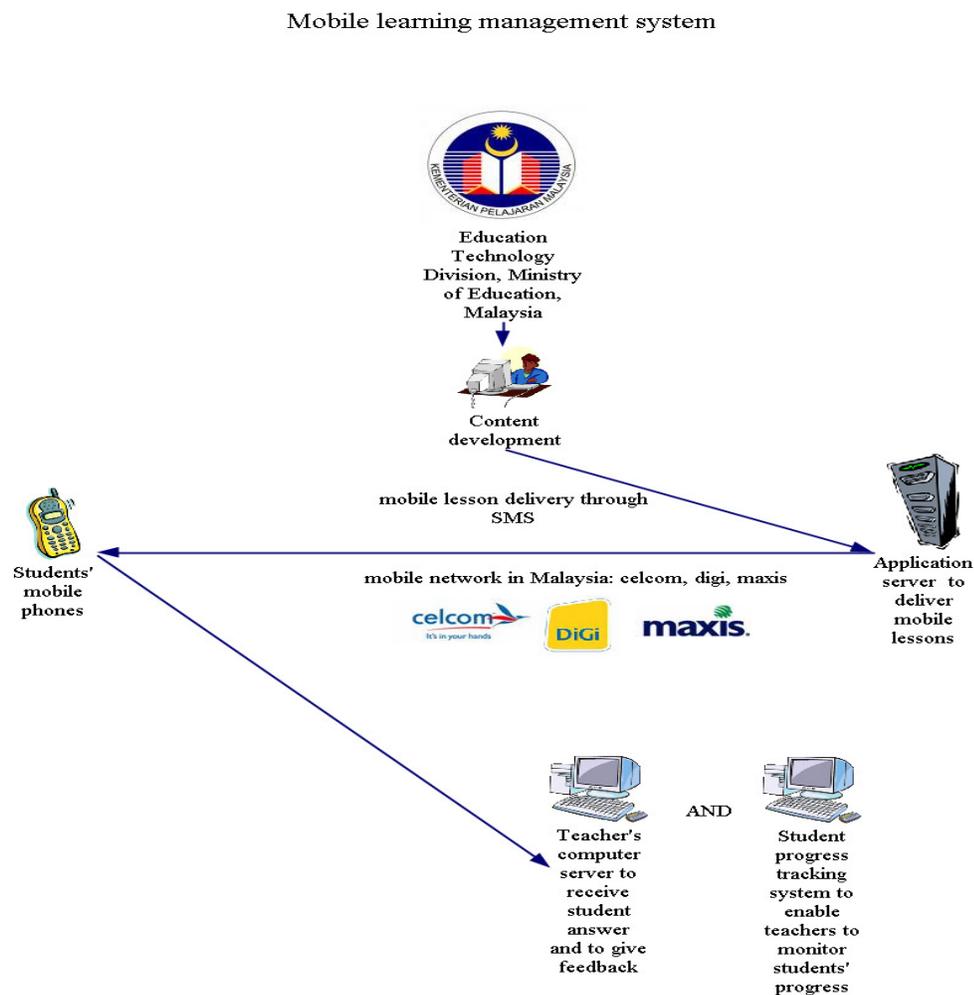
- (xviii) The bite size lesson is suitable for hectic live for students today. Mobile technology can assist vocabulary learning by providing learners with bite size lessons that they can assimilate in a limited time available.
- (xix) As a study aid to uniquely support English vocabulary learning.
- (xx) It can support personalisation through customising the lessons according to students' level of performance.
- (xxi) Learning through mobile learning is engaging and motivating.
- (xxii) As an alternative to flash cards.
- (xxiii) Mobile devices are cost effective and might reduce costs in comparison to other computing devices such as networked computers.
- (xxiv) Among language learning projects with mobile technology, vocabulary learning is the most popular course after listening course.
- (xxv) As a formative assessment mechanism.
- (xxvi) As a blended learning tool.



## 1.2 Resourcing mobile learning

This component includes suggestions regarding the facilities needed for mobile learning implementation.

- To implement mobile learning in schools, there is a need to consider the following costs: (i) mobile content development (ii) application server to deliver mobile lessons (iii) mobile devices (iv) mobile network (v) teachers' computer server (vi) student progress tracking systems. *The system architecture is shown in the following figure:*



- *It is expected that the government will support the whole cost of the implementation.*
- However, if there is a need to distribute the cost of purchasing the mobile devices with parents and students, feasible option is to include a scheme,

which will be proposed to enable parents to purchase these devices for their children. This will be explained further in 2.1 Ownership model, page 8.

- *Another alternative is to use students' own devices if they already have one.*
- Affordable mobile phones are suggested to be used in this implementation. The feature that the proposed mobile phones should have is SMS technology to support the delivery of the mobile lessons. The following figure showed the current mobile phones' model which is affordable and could be considered for the implementation (retrieved from myphone.com.my dated 27th January 2009):

j) Nokia 1680 priced at RM200 (equivalent to £40)



### FEATURES

Features  
Messaging SMS, MMS, Email, Instant Messaging  
Browser WAP 2.0/xHTML  
Games Yes  
Colours Black, Slate Gray, Wine Red, Deep Plum  
Camera VGA, 640x480 pixels, video  
- Nokia Xpress Audio Messaging  
- Calendar  
- Calculator  
- Voice memo  
- Built-in handsfree  
- English-Chinese dictionary

ii) Sony T250 priced at RM205 (equivalent to £40)



### FEATURES

Features  
Messaging SMS, MMS  
Browser WAP 1.2.1  
Games Yes  
Colours Aluminium Silver, Aluminium Black  
Camera VGA, 640x480 pixels  
- FM radio with RDS  
- Slide show  
- Full screen viewer  
- T9  
- Stopwatch  
- Timer  
- Built-in handsfree

- *The government might consider cooperating with mobile phone company by offering incentives for their contributions.*
- As mobile devices will become less expensive, another type of mobile devices such as smart phones, which offer better functions, might be considered in the future.
- Regarding the cost for developing content, there is a company in Malaysia which already step ahead in producing mobile lessons. This company is known as LTT Global Communication. The government might consider to cooperate with this company by offering incentives for the contribution towards Malaysia Education System. Open source software might also be considered to be used.
- The cost for providing mobile network might be shared with network providers in Malaysia, which are Digi, Celcom and Maxis. These companies should be encouraged to contribute in this implementation by offering incentives to them.
- The aforementioned suggestions will ensure that the proposed infrastructures are affordable, practical and feasible for the implementation.

- ***Part 2: Policy & procedure of implementing mobile learning at school***



### **2.1 Ownership model**

This component includes suggestions regarding the strategy which will be applied to enable all students have equity access to mobile devices.

- In order to provide opportunities for all students to acquire mobile devices for learning there will be two options:
  - 3) Ownership - students and parents will pay for the devices. The total cost of the mobile devices will be separated over five years, which is for the whole duration in secondary schools (from Form 1 to Form 5). Students will get full ownership of the devices. The Financial Responsibility Agreement will be signed by parents and students indicating:
    - (i) Purchase Scheme, which will indicate monthly or annual instalment, which needs to be paid.
    - (ii) Other payments that may incur. For example, payment for insurance, additional warranty coverage for the device, accidental damage protection and payment to repair the devices.
  - 4) Loanership - students will loan the devices. This model is proposed especially to students who are unable to purchase the devices. It is similar to the procedure in “Text Book Loan Scheme” which is being implemented in Malaysian schools. In this model, Loanership Agreement will be signed by parents and students indicating their responsibilities towards the devices:
    - (i) To take good care for the devices
    - (ii) To pay for the damage or lost of the devices
    - (iii) To return the devices in good working condition to school during school holidays and when they transfer to another school.
- The aforementioned suggestions will ensure that all students will have the opportunities to acquire mobile devices in spite of their financial situations and to lessen the financial burden of parents.



## 2.2 Acceptable use policy

This component includes suggestions regarding the regulation, which needs to be adhered by students in using mobile technologies for learning.

- To prevent and to eliminate problems associated with intentional and unintentional misuse of mobile technologies, an acceptable use policy should be established.
- In the acceptable use policy, parents and students will be informed regarding the inappropriate behaviour pertaining to the use of the devices.
- Inappropriate behaviour may include:
  - 8) Sending malicious contents or messages to other people
  - 9) Sending abusive or harassing messages to other people
  - 10) Installing unauthorised programs (for devices which are being loaned)
  - 11) Vandalising or stealing data/devices
  - 12) Accessing illegal or inappropriate content
  - 13) Using devices in an inappropriate manner which will lead to damage
  - 14) Other undefined inappropriate behaviour that may arise as implementation takes place
- In the acceptable use policy, parents and students will also be informed of the consequences of misconduct.
- Consequences of misconduct may include:
  - 6) Verbal warning
  - 7) Official warning
  - 8) Caning
  - 9) School suspension
  - 10) School expulsion
- Parents and students will sign a Consent and Waiver Form to indicate that they have understood the content of the acceptable use policy.
- The aforementioned suggestions will prevent and eliminate the implications of improper use of mobile technologies.



### 2.3 Management and maintenance

This component includes suggestions regarding the strategies, which will be applied in managing and maintaining the equipment.

- To implement mobile learning, there is a need to develop procedures for the management and maintenance of the equipment.
- The procedures are as the following:
  - i) All devices which will be loaned to students should be marked with serial numbers as well as school's name and ID code or bar code. Also, to safeguard the devices with a password.
  - vii) The school should keep a systematic inventory of the devices for easy identification. This is useful so that the devices can be returned to its owner in the event of lost or misplaced.
  - viii) All devices should be provided with protective cases to give appropriate protection and to help reducing the occurrence of breakage.
  - ix) It is also beneficial to consider adopting an asset management mechanism such as mobile devices tracking systems, which will track and recover stolen or missing mobile devices, *locking the devices as well as securing the devices with specific security numbers.*
  - x) In order to ensure that learning activities will not be interrupted while the devices are sent for repair, school should provide temporary supplies or loan stocks to students.
  - xi) The school should also need to determine where to send the devices for repair in case of faults.
  - xii) *The school should also figure out to purchase the insurance or additional warranty coverage for the device. Even though this may incur additional expenses, purchasing insurance is regarded as a good investment for the implementation.*
  - xiii) *Employing basic mobile phones so that it will be less attractive to theft and to eliminate claiming fraud where students deliberately lose it with the intention to claim the money.*
  - xiv) *Promote student awareness regarding the responsibility towards the devices as well as initiate ownership and responsibility by giving the chance for students to customise their devices.*
- The aforementioned suggestions will ensure effective management and maintenance of mobile devices and to eliminate lost, damage, theft, misplaced and other unwanted occurrences.



## 2.4 Specific roles for supporting mobile learning at school

This component includes suggestions regarding the specific roles needed for the implementation.

- *To implement mobile learning, there is a need to assume or assign specific roles, which are English language subject leaders (Ketua Panitia Bahasa Inggeris), technical support staffs (help desks) at each school or centralised help desk depending on demand and students as additional technical support.*
- The roles of an English language subject leader (Ketua Panitia Bahasa Inggeris) are as the following:
  - i) To coordinate mobile learning implementation.
  - vi) To ensure that English language teachers will conduct mobile learning according to the structure and syllabus as instructed by the Ministry of Education Malaysia.
  - vii) To monitor and evaluate students' progress.
  - viii) To audit and to inform to school principals regarding the progress of the implementation.
  - ix) To encourage and provide on-going support to English language teachers throughout the implementation.
- *The roles of a technical support staff (help desk) are as the following:*
  - iv) *To perform comprehensive management and maintenance of all facilities related to the implementation.*
  - v) *Specific responsibilities include; conducting periodic check, performing early diagnoses of broken facilities and sending devices for repair to supplier when necessary.*
  - vi) *To gather knowledge about the technology in the implementation.*
  - vii) *To provide on-going support to English language teachers and students throughout the implementation.*
- *The roles of a student as additional support are as the following:*
  - i) *To provide assistance for technical support staff (help desk)*
- The aforementioned suggestions will ensure that there will be comprehensive support in the implementation.



## 2.5 Support for major stakeholders

This component includes suggestions regarding the support, which will be given to the major stakeholders in the implementation

- To implement mobile learning, there is a need to provide comprehensive support to teachers, students and parents.
- For teachers:
  - vi) Although teachers are familiar with mobile devices, professional development for teachers is still necessary.
  - vii) Teachers will be given comprehensive induction sessions regarding the benefit and objective of the implementation, as well as hands-on professional learning regarding the knowledge and skills required for mobile technology utilisation.
  - iv) Teachers will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to apply that understanding in practice.
  - viii) Teachers will be given ongoing support, which will foster motivation throughout the implementation.
  - ix) Teachers will be given sufficient time to explore and familiarise themselves with new devices before the implementation.
  - x) *Teachers might also be encouraged to contribute in the pilot project for the implementation to initiate ownership among teachers.*
  - xi) Partnership with local universities, education organisations and other institutions are also encouraged so that schools will be able to gain expertise and assistance for training purpose.
  - xii) *It is also advisable to implement mobile learning step by step, starting from one level to another, for example at the beginning might begin with Form 1 before introducing it to other levels.*
- The aforementioned suggestions will ensure that teachers will be well-informed regarding the objective of mobile learning, become familiar with the technology and confidence to use it, which will finally initiate positive attitude towards the implementation.
- For students:
  - i) Students will be given comprehensive induction sessions regarding the benefit and objective of the implementation, knowledge and skills required for mobile technology utilisation.
  - v) Students will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to apply that understanding in practice.
  - vi) Students will be given ongoing support, which will foster motivation throughout the implementation.
  - vii) Students might be encouraged to exchange opinions with teachers regarding their interest to use latest technology in their learning activities.

- viii) Students might also be encouraged to contribute to a pilot project to foster support from them.
- ix) *There is also a need to address the issue of cyber-bullying. An appropriate action might include: (i) secure students mobile phone number and encourage students not to share phone numbers with friends, (ii) clear protocol in assigning people who can access certain data or information, (iii) set anonymous number of students, (v) school to cooperate with the police and private companies to deal with cyber bullying*
- xiii) *It is also advisable to implement mobile learning step by step, starting from one level to another, for example at the beginning might begin with Form 1 before introducing it to other levels.*
  - The aforementioned suggestions will ensure that students will be well-informed regarding the objective of mobile learning, become familiar with the technology and confidence to use it, which will finally initiate positive attitude towards the implementation.
  - The suggestions are also proposed to eliminate negative implications of mobile technologies towards students and to promote productive use of the devices.
- For parents:
  - iv) *Parents will be informed regarding the implementation through various methods; support documents or letters, school web pages and information day or parents' evening.*
  - v) Parents will be given comprehensive briefing sessions regarding the benefit and objective of the implementation, role of parents as stakeholders in the implementation, as well as procedures and policies related.
  - vi) Parents will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to monitor their children to use mobile devices productively and to eliminate negative implications of mobile technologies towards their children.
  - vii) Parents will be informed about the progress of their children in the utilisation of the devices from time to time.
  - viii) *To foster parents' support, it is also advisable to reassure parents that there will be minimal expenses in the implementation.*
- The aforementioned suggestions will ensure that parents will be well-informed regarding the objective of mobile learning, initiate positive attitude and to encourage parent involvement in students' learning.

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**Appendix C: Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia (Dissemination and Distribution Stage)**



**Mobile Learning  
in  
English Language Learning:  
An implementation strategy for  
secondary schools in Malaysia**

**Dissemination & Distribution Stage**

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# Contents

Preface	ii
Introduction	iii
<b>Part 1: Mobile technology integration into the curriculum</b>	
1.1 Mobile lessons	1
1.2 Resourcing mobile learning	5
<b>Part 2: Policy &amp; procedure of implementing mobile learning at school</b>	
2.1 Ownership model	7
2.2 Acceptable use policy	8
2.3 Management and maintenance	9
2.4 Specific roles for supporting mobile learning	10
2.5 Support for major stakeholders	12
<b>Bibliography</b>	
Part 1: Mobile technology integration into the curriculum	14
Part 2: Policy & procedure of implementing mobile learning at school	16

## Preface

In introducing **English vocabulary learning through mobile phones** in Malaysian secondary schools, an implementation strategy is developed. The objectives of introducing English vocabulary learning through mobile phones are to bring **added value for English Language efforts in Malaysian secondary schools** and as an **alternative to using affordable technologies to support teaching and learning**. The need for the research was also based on the rise of mobile learning interests in Malaysia. It also addresses the need for guidance towards the implementation in Malaysian secondary schools.

The implementation strategy is formulated by taking into consideration the following matters:

Existing policy of the Ministry of Education in Malaysia to utilise ICT in teaching and learning.

Vision of the Malaysian Smart Schools' implementation to utilise ICT which also includes mobile technologies.

Justification from the academic literature related to mobile technology integration in schools.

Opinion from educational experts in the United Kingdom: English Language subject leaders, ICT subject leaders and head teachers.

Opinion from educational experts in Malaysia: English Language subject leaders, ICT subject leaders, school principals, and officers from Ministry Of Education, Malaysia.

**The objective** of this document is **to propose a strategy for the implementation of mobile learning for English Language learning in Malaysian schools**.

This document is divided into two parts:

Part 1: Mobile technology integration into the curriculum. It consists of the overview of the suggested mobile lessons and infrastructure.

Part 2: Policy & procedure of implementing mobile learning at school. It consists of the policy and procedure developed for the implementation.

## Introduction

- **Examples of schools which utilised mobile phones** for teaching and learning are:

i) **Notre Dame High School in Sheffield, United Kingdom:**

Mobile phones are used in various learning activities such as in a science experiment or in geography field trips. The implementation was supported by an acceptable use policy to ensure that mobile phones are used productively for teaching and learning.

ii) **Wiregrass Ranch High School, United States of America:**

The school principal believes that mobile phones can be a powerful assistive technology if used in appropriate context. Students are guided by appropriate rules in using mobile phones productively for learning purpose.

iii) **Otumoetai Intermediate School, New Zealand:**

Mobile phones are used in various subjects such as literature and mathematics as well as note takers. The response among the stakeholders; parents, staffs and students are positive. School's management was complimented for introducing the programme.

- For Malaysian secondary schools, initially, mobile phones are suggested to be used in the English Language subject. In the future, mobile phones can also be utilised in other subjects. For example, mobile phones can be used in various learning activities such as in field trips and homework.
- The implementation is proposed to be introduced gradually. It is suggested to begin with one level to another.
- **To compensate existing policy at Malaysian schools**, the delivery of the mobile lessons will be conducted during **out-of-school hours** and **during school holidays**.
- Mobile learning is **suitable to be implemented in smart schools**, parallel to the vision of the smart schools which encouraged the use of ICT in teaching and learning.
- For other schools, it would be appropriate to be offered to students as an optional learning tool.

- **Part 1: Mobile technology integration into the curriculum**



### 1.1 Mobile lessons

This section includes suggestions regarding the content and structure of the mobile lessons.

- The researcher proposes to introduce **mobile lessons through Short Message Service (SMS)**, which consists of **vocabulary introduction and explanation, vocabulary review through multiple-choice questions and feedback mechanism**.
- The design of the mobile lessons replicates previous projects in vocabulary-learning through mobile phones. One of them is SMS-ME ENGLISH from LTT Global Communication, Malaysia. Another application which has been studied is Vidiom, which delivers visual explanation of English idioms. The mobile lessons are also based on the initiative of Learning Italian via SMS, an application which supports Italian learning and uses SMS as the mechanism to deliver vocabulary.
- The objective of the mobile lessons is to provide interactive learning activities, which will support vocabulary acquisition for secondary school students in improving their command of English Language. The mobile lessons are **suitable to be integrated into learning activities at schools** such as listening, speaking, reading and writing.
- The mobile lessons will **conform to the syllabus** provided by the Ministry of Education, Malaysia. The mobile lessons will be used as a supplement to support teaching and learning; **for enrichment and preparation**. For example, in regards to enrichment, it is suitable to be used to revise the vocabularies that students have learned previously. In regards to preparation, it is suitable to be used for pre-writing.
- A list of vocabulary which is appropriate to be used by secondary school will be based on the Syllabus and Curriculum Specification of the Curriculum Development Centre, Ministry of Education, Malaysia (<http://www.ppk.kpm.my/>). It is also suitable to introduce science, mathematics and technical terminology and vocabulary from other sources to enrich students' knowledge.

- There will be four sections in the mobile lessons:
  - a) **Introducing vocabulary** (pronunciation in Malay Language and meaning in English Language and Malay Language).
  - b) **Showing the usage** of the vocabulary.
  - c) **Reviewing** the vocabulary.
  - d) **Feedback** mechanism.

**As an example**, the word “**envy**” is obtained from the syllabus:

a) Introducing vocabulary (pronunciation in Malay Language and meaning in English Language and Malay Language).

**envy**

Pronounce as (*envi*)

Meaning in English Language: a feeling of discontent and ill will because of another's advantages or possessions.

Meaning in Malay Language: *perasaan tidak puas hati dan sakit hati terhadap kelebihan atau kepunyaan orang lain.*

b) Showing the usage of the vocabulary.

Examples:

1. I just **envy** her ability to organise a grand open house for Hari Raya.
2. My friend looked with **envy** at my new SAGA car.

c) Reviewing the vocabulary.

Which one of the following is not the right usage for the word “**envy**”?

- A. I just **envy** anyone who performs better than me.
- B. The angry son said he did not **envy** his mother’s decision.
- C. His **envy** caused him to damage my house.
- D. The rich always **envy** the difficulties of the poor.

d) Feedback mechanism

Students will send SMS containing answers for quizzes directly to the application server. An automatic feedback from application server will be delivered to students providing the answer and explanation. For example:

Students will type:

Q1: D to number 8888.

Students will receive:

Your answer is correct.  
D is the correct answer because the example provided in D does not show the correct meaning of the word.

Figure 1: Example of the proposed mobile lessons

- Students will also be taught about root words and family words related to the vocabularies under specific themes. Sentences which will be provided in the mobile lessons will be Malaysian context and suitable to be used for English as a Second Language (ESL) learner.

- The mobile lessons will be divided into two levels; lower form (Form 1 to Form 3) and upper form (Form 4 to Form 5). It will be further divided into three levels which are beginner, intermediate and advance. Students will be able to choose appropriate levels which suit them.
- To make the mobile lessons more engaging, it is also useful to **apply multimedia elements**, such as sound and animation as exemplified in Mobile Malay Idioms for Malaysian primary school students developed by researchers in Universiti Technical Malaysia.
- The delivery of the mobile lessons will be conducted **during out-of-school hours and during school holidays**.
- The researcher suggests to deliver the mobile lessons **three times a week**, every Monday, Wednesday and Friday. Students who attend school in the morning session will receive their mobile lessons in the evening while students who attend school in afternoon session will receive their mobile lessons in the morning.
- The delivery of the mobile lessons will be as follows:
  - i. On Monday, first six words will be delivered.
  - ii. On Wednesday, another six words will be delivered together with previous words that have been delivered on Monday.
  - iii. On Friday, students will repeat all words that they have learned through weekly quizzes.
- Another viable approach is to **enable students to request mobile lessons to be delivered to them whenever appropriate**.
- Teachers will be able to monitor students' progress via **the Students Progress Tracking System**. The following figure illustrates the overview of the proposed system:

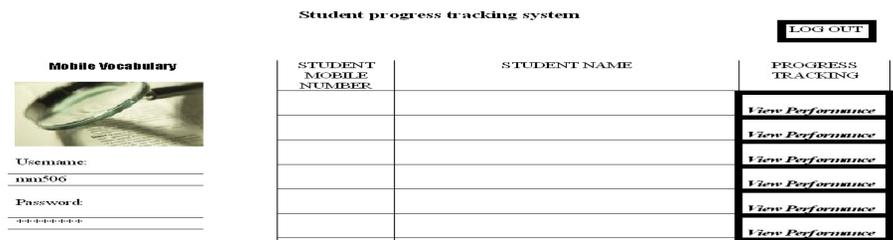
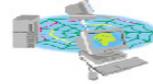


Figure 2: Students Progress Tracking System

- The **benefits of implementing mobile learning in vocabulary-learning**:
  - (i) As a suitable medium for repetition or **drill and practice** for memory retention.
  - (ii) Mobile technologies through SMS have an advantage as **“push” technology**, which **encourages students to study regularly**.

- (iii) As an **interactive learning activity** where students are able to receive immediate feedback.
- (iv) **Bite size lessons** are suitable for students' busy life. Mobile technology assists vocabulary-learning by providing learners with bite size lessons that enable them to study within limited time.
- (v) Encourage students to become **autonomous learners** by enabling them to monitor their own progress without over depending on the teachers.
- (vi) As a study aid to **uniquely support English vocabulary-learning**.
- (vii) **Support personalisation** by customising mobile lessons according to students' level of performance.
- (viii) Learning through mobile learning is **engaging and motivating**.
- (ix) As an **alternative to flash cards**.
- (x) Mobile devices are **cost-effective** in comparison to other computing devices such as networked computers.
- (xi) Among language-learning projects with mobile technology, vocabulary-learning is the most popular course after listening course.
- (xii) As a **formative assessment mechanism**.
- (xiii) As a **blended learning tool**.



## 1.2 Resourcing mobile learning

This section includes suggestions regarding the facilities needed for mobile learning implementation.

- To implement mobile learning in schools, there is a need to consider the following **costs**: (i) mobile content development (ii) application server to deliver mobile lessons, receive students answer and to give feedback (iii) mobile phones (iv) mobile network (v) student progress tracking systems. The system architecture is shown in the following figure:

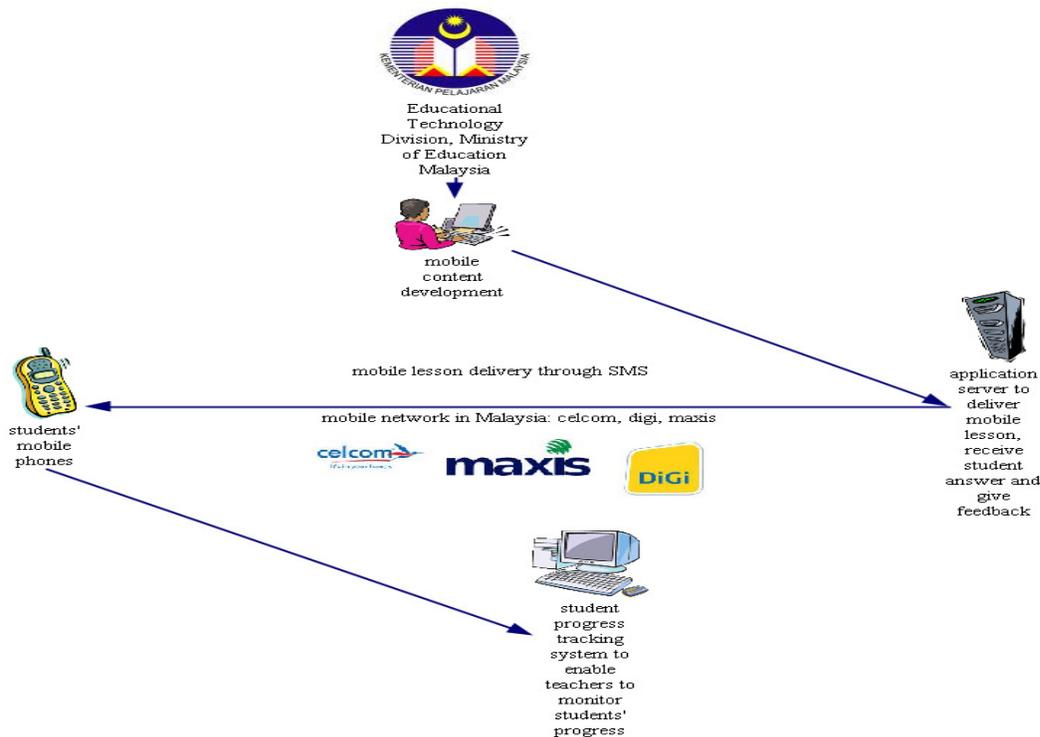


Figure 3: Facilities proposed for mobile learning implementation

- It is expected that the government will support the entire cost of the implementation.
- However, if there is a need to share the cost of purchasing mobile phones with parents, a practical option is to apply a scheme to enable parents to purchase mobile devices for their children. This suggestion will be explained further in 2.1 Ownership model, page 7.
- Another alternative is to use students' own devices.
- The **mobile phones** which will be used are **basic models**, most probably **below RM100** which is equivalent to USD32.

- It is also useful to use **specific models such as “Firefly” mobile phones** which are **designed specifically for children** (<http://www.fireflymobile.com/>). “Firefly” mobile phones are equipped with parental features to help monitor usage and keep costs under control. The mobile phones are priced from USD49.99 which is equivalent to RM150.
- As mobile devices become less expensive, other types of mobile devices such as smart phones, which provide better functions, might also be considered.
- The government might consider **cooperating with mobile phone companies** such as Motorola Malaysia and Sony Ericsson Malaysia by offering incentives for their contributions. Mobile phone companies might be able to support by providing easy-payment schemes.
- Regarding the **cost for developing content**, there is a company in Malaysia which already step ahead in producing mobile lessons. This company is known as LTT Global Communication. The government might consider to cooperate with this company by offering incentives for the contribution towards Malaysia Education System.
- In addition to local companies, **collaboration with local universities** in developing the content should also be encouraged. Recently, there are some universities in Malaysia, which have conducted mobile learning projects.
- The use of **open source software** might also be considered.
- The cost for providing mobile network might be reduced by **collaborating with network providers** in Malaysia, namely Digi, Celcom and Maxis. These companies should be encouraged to contribute to the mobile learning implementation by the offer of incentives.
- The aforementioned suggestions will ensure an effective approach in preparing the facilities for the implementation.

- ***Part 2: Policy & procedure of implementing mobile learning at school***

### **2.1 Ownership model**



This section includes suggestions regarding the strategy which will be applied to enable all students to have equal access to mobile devices.

- In order to provide opportunities for all students to acquire mobile devices, there will be two options:
  - 1) **Purchase scheme** - parents will pay for the devices. The total cost of the mobile devices will be spread over five years, which is for the whole duration of secondary school education (from Form 1 to Form 5). Students will get full ownership of the devices. A **Financial Responsibility Agreement** will be signed by parents and students indicating:
    - (i) Monthly or annual instalments which need to be paid.
    - (ii) Other costs that may incur. For example, payments for insurance, additional warranty coverage for the device, accidental damage protection and payment to repair the devices.
  - 2) **Loan scheme** - students will loan the devices. This model is proposed specifically to students who are unable to purchase the devices. It is similar to the procedure in “Text Book Loan Scheme” which is being implemented in Malaysian schools. In this model, a **Loan Scheme Agreement** will be signed by parents and students indicating their responsibilities for the devices:
    - (i) To care for the devices.
    - (ii) To pay for damage or loss of the devices.
    - (iii) To return the devices in good condition during school holidays and when transferring to other schools.
  - 3) Instead of Loan Scheme Agreement, another approach is to ask deposits for loan devices. At the end of the year, deposits will be returned if there is no damage.
  - 4) For students who come from low-income family, it is also reasonable to use Parents Teachers Association fees or student support fund to purchase mobile devices.
- The aforementioned suggestions will ensure that all students will have opportunities to acquire mobile devices regardless of their financial situations as well as to minimise the financial burden on parents.



## 2.2 Acceptable use policy

This section includes suggestions regarding the regulations which will guide the students in using mobile technologies productively for learning purpose.

- **To prevent and to eliminate problems associated with intentional and unintentional misuse of mobile technologies**, an acceptable use policy should be established. It will be paralleled to existing rules at schools.
- In the acceptable use policy, parents and students will be informed regarding the inappropriate behaviour pertaining to the use of the devices.
- Inappropriate behaviour might include:
  - 1) Sending malicious contents or messages to other people.
  - 2) Sending abusive or harassing messages to other people.
  - 3) Installing unauthorised programs (for devices which are being loaned).
  - 4) Vandalising or stealing data/devices.
  - 5) Accessing illegal or inappropriate content.
  - 6) Using devices in an inappropriate manner which will lead to damage.
  - 7) Other inappropriate behaviour that may occur as implementation takes place.
- In the acceptable use policy, parents and students will also be informed about the consequences of misconduct.
- Consequences of misconduct might include:
  - 1) Verbal warning.
  - 2) Official warning.
  - 3) Caning.
  - 4) School suspension.
  - 5) School expulsion.
- Parents and students will sign a **Consent and Waiver Form** to indicate that they have understood the content of the acceptable use policy.
- The aforementioned suggestions will help to prevent and eliminate the implications of improper use of mobile devices.



### 2.3 Management and maintenance

This section includes suggestions regarding the strategies which will be applied in managing and maintaining the equipment.

- To implement mobile learning, there is a need to apply **procedures for the management and maintenance of the equipment.**
- The procedures are as follows:
  - i) All devices which will be loaned to students should be marked with serial numbers as well as school's name. Also, to safeguard the devices with password.
  - ii) The school should keep a systematic inventory of the devices for easy identification. This is useful so that a device can be returned to its owner in the event of lost or misplaced.
  - iii) All devices should be provided with protective case which will help to reduce damage.
  - iv) It is also useful to consider adopting mobile theft solution, which will track and recover stolen or missing mobile devices. Ideally, it should be offered as optional for high-cost devices. For low-cost devices, purchasing new mobile phones for replacement is more cost effective.
  - v) In order to ensure that learning activities will not be interrupted while the devices are sent for repair, school should provide temporary supplies or loan stocks to students.
  - vi) The school should also determine where to send the devices for repair in case of faults.
  - vii) When appropriate, insurance or additional warranty coverage should also be purchased. Although this may incur additional expenses, purchasing insurance is a good investment.
  - viii) Utilising basic mobile phones' will make them less attractive to thieves and will help to eliminate insurance fraud where students deliberately lose them with the intention to claim the money.
  - ix) It is useful to promote student awareness to have a responsibility towards the devices. In addition, it is also beneficial to give students the opportunity to customise their devices. This is to boost a sense of ownership which will eventually initiate student's responsibility towards the devices.
- The aforementioned suggestions will ensure effective management and maintenance of the equipment and will help eliminate loss, damage, theft and other unwanted incidence.

## 2.4 Specific roles for supporting mobile learning at school



This section includes suggestions regarding the specific roles needed for the implementation.

- To implement mobile learning, there is a need to assume or assign specific roles, namely the English language subject leader (*Ketua Panitia Bahasa Ingeris*), technical support staff (help desk) and students as maintenance assistant.
- The roles of an **English language subject leader (*Ketua Panitia Bahasa Ingeris*)**:
  - i) To coordinate mobile learning implementation for English subject.
  - ii) To provide on-going support to English language teachers throughout the implementation.
- Arrangement for **technical support staff (help desk)**:
  - A) Providing additional technical support staff**
    - i) Additional technical support staff should be considered for large schools.
    - ii) It is also suitable to be offered as part-time work.
  - B) Using existing technical support staff**
    - i) For small schools, it is appropriate to use an existing technical support staff.
    - ii) Training will be provided for existing technical support staff.
  - C) Sharing technical support staff between schools**
    - i) Technical support staff might also be shared among neighbouring schools.
    - ii) This approach has been applied by Rebound Asia Malaysia, a company which provides technical support staff in schools in Terengganu, Malaysia.
  - D) Appointing teachers as technical support staff**
    - i) It is also appropriate to appoint teachers for this position.
    - ii) Training will be provided for the teachers and teaching hours will be reduced.
- The roles of the technical support staff:
  - i) To perform comprehensive management and maintenance of all facilities related to the implementation.
  - ii) To perform specific responsibilities which include: conducting periodic checks, receiving information from teachers and students regarding the damaged facilities, performing early diagnoses of broken facilities and sending devices for repair to the supplier when necessary.
  - iii) To gather knowledge about the technology in the implementation.
  - iv) To provide on-going support to teachers and students.
- Arrangement for **student as maintenance assistant**:
  - i) To provide assistance for technical support staff.

- ii) Students can be selected from **cyber brigades (smart schools)** and **computer clubs (non-smart schools)**.
  - iii) Training will be provided for students and they would also obtain merit for their involvement.
- The aforementioned suggestions will ensure comprehensive support in the implementation.



## 2.5 Support for major stakeholders

This section includes suggestions regarding the support which will be provided to major stakeholders in the implementation.

- To implement mobile learning, there is a need to provide comprehensive **support for teachers, students and parents.**
- **For teachers:**
  - i) Although teachers are familiar with mobile devices, professional development for teachers is still necessary.
  - ii) Teachers will be given comprehensive **induction sessions** regarding the benefits and objectives of the implementation, as well as hands-on professional learning regarding the knowledge and skills required for mobile technology utilisation.
  - iii) Teachers will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning, to enable them to apply that knowledge in practice.
  - iv) Teachers will be given **ongoing support**, which will foster motivation throughout the implementation.
  - v) Teachers will be given sufficient time to explore and familiarise themselves with new devices before the implementation.
  - vi) Teachers might also be encouraged to contribute to a pilot project to initiate ownership.
  - vii) Partnerships with local universities, education organisations and other institutions are also encouraged so that schools will be able to gain expertise and support for training purposes.
- The aforementioned suggestions will ensure that teachers will be well-informed regarding the objectives of the implementation, become familiar with the technology and have the confidence to use it. This will eventually initiate positive attitude towards the implementation.
- **For students:**
  - i) Students will be given comprehensive **induction sessions** regarding the benefits and objectives of the implementation, knowledge and skills required for mobile technology utilisation.
  - ii) Students will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices for learning to enable them to apply that knowledge in practice.
  - iv) Students will be given **ongoing support**, which will foster motivation throughout the implementation.
  - v) Students might be encouraged to exchange opinions with teachers regarding their interest to use latest technology in their learning activities.
  - vi) Students might also be encouraged to contribute to a pilot project to foster support from them.
  - vii) There is also a need to address the issue of cyber-bullying. An appropriate action might include: (i) secure students' mobile phone numbers and

encourage students not to share phone numbers with friends, (ii) establish a clear protocol in assigning people who can access certain data or information, (iii) set anonymous numbers for students, (iv) encourage schools to cooperate with the police and private companies to deal with cyber-bullying

- The aforementioned suggestions will ensure that students will be well-informed regarding the objectives of mobile learning, become familiar with the technology and have the confidence to use it. This will eventually initiate positive attitude towards the implementation.
- The aforementioned suggestions are also proposed to eliminate the negative implications of mobile technologies towards students and to encourage productive use of the devices.
- **For parents:**
  - i) Parents will be informed regarding the implementation through various approaches: support documents or letters, school websites and special events such as information day, parents' evening, weekend meeting, Parents Teachers Association meeting, or school open day.
  - ii) Parents will be given comprehensive **briefing sessions** regarding the benefits and objectives of the implementation, parents' role in the implementation, as well as related policies and procedures.
  - iii) Parents will be informed regarding the safety, security and ethical issues surrounding the use of mobile devices to enable them to monitor their children to use mobile devices productively. This will eventually eliminate negative implications of mobile technologies towards their children. For example, by having the knowledge to look for inappropriate content in their children's mobile phones.
  - iv) Parents will be informed about the progress of their children in the implementation from time to time.
  - v) To foster parents' support, parents will be assured that there will be minimal expenses in the implementation.
- The aforementioned suggestions will ensure that parents will be well-informed regarding the objectives of mobile learning, have a positive attitude and being involved in students' learning.

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**Appendix D: Interview schedule for head teachers and deputy head teachers in the preliminary field tests**

**Version: Preliminary field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (Head teacher/Deputy head teacher)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the Head teacher or Deputy head teacher in the United Kingdom.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. To implement mobile learning at school, there is a need to consider the cost to provide computer server, mobile devices, mobile content and network to deliver the mobile lessons to students. What is your suggestion on getting the funding for the implementation?

Q2. What is your suggestion to enable students acquiring the mobile phones to be used in the implementation?

Q3. Teachers, students and parents are important stakeholders in the integration of technology at school.

- i. What is your suggestion to prepare the teachers with the proper attitude, sufficient knowledge and skills for the implementation?
- ii. What about the students?
- iii. Regarding the parents, how to ensure that the parents are aware and well informed about the implementation, and eventually foster their support?

Q4. There is a need to assign or assume specific roles at schools that will support the implementation.

- i. What is your suggestion regarding the role of ICT coordinator?
- ii. What about English subject leader?

Q5. There are some negative aspects of mobile learning which might affect the students.

- i. One of the issues is related to students' security and safety (example: theft of the devices, health issues such as repetitive stress injury). What are the strategies that need to be taken by the school to prevent these issues from happening?
- ii. Another issue is related to ethics in using mobile devices (example: inappropriate use of devices). What is your suggestion regarding the strategy to handle this matter?

Q6. How to ensure that the students are aware about these issues?

Q7. Do you have anything else to add?

**Appendix E: Interview schedule for ICT subject leaders in the preliminary field tests**

**Version: Preliminary field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (ICT subject leader)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the ICT subject leader in the United Kingdom.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. Technical support staff is an important stakeholder for the integration of technology at school:

- i. What is your opinion regarding the suggestion to assign technical support staff specifically for mobile learning implementation?
- ii. If technical support staff is assigned to the implementation, what is your suggestion regarding the roles?
- iii. In a trial implementation in some schools, students contributed as additional technical support besides technical support staffs. What is your opinion regarding this practice?

Q2. Management and maintenance of the devices are very important in the implementation.

- iv. What are the strategies that need to be taken to prevent the students from losing and damaging the devices?
- v. What are the strategies that need to be taken to prevent the mobile devices from being stolen?
- vi. What are the strategies that need to be taken to deal with faulty of the devices?

Q3. Do you have anything else to add?

**Appendix F: Interview schedule for English subject leaders in the preliminary field tests**

**Version: Preliminary field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (English subject leader)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the English subject leader in the United Kingdom.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. Mobile lessons through SMS which consist of the vocabulary explanation, quizzes and feedback mechanism is suggested for the implementation. After answering quizzes by sending the answers to teachers' number on the computer server, an automatic feedback from the server will be delivered to students. In addition, teachers are able to monitor students' progress via the Students Progress Tracking System.

- i. About the mobile lessons, is the structure pedagogically sound for vocabulary acquisition?
- ii. How to integrate the mobile lessons into the existing curriculum?

Q2. Mobile lessons which consist of three new words will be delivered to students 3 times a week, at 8 pm on Monday, Wednesday and Friday. What is your opinion regarding this schedule?

- i. Is the schedule suitable to fit with the students daily activities?
- ii. Is the schedule enabling the students to master the lessons effectively?

Q3. Do you have anything else to add?

**Appendix G: Interview schedule for head teachers and deputy head teachers in the main field tests**

**Version: Main field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (Head teacher/Deputy head teacher)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the Head teacher or the deputy head teacher in Malaysia.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. To implement mobile learning at school, there is a need to consider the cost to provide computer server, mobile devices, mobile content and network to deliver the mobile lessons to students.

- i. To get funding for the implementation, possible solutions are to obtain it from :
  - a) Government
  - b) Private/local companyIs there any issue that you can see from this suggestion? Why?
  
- ii. To ensure that students will acquire the mobile devices, possible solutions are to introduce:
  - a) Purchase scheme
  - b) Loan schemeIs there any issue that you can see from this suggestion? Why?

Q2. Teachers, students and parents are important stakeholders in the integration of technology at school.

- i. To prepare teachers with the proper attitude, sufficient skills and knowledge, a possible solution is to provide training for teachers. Is it effective/sensible/practical? Why?
  
- ii. To prepare students with the proper attitude, sufficient skills and knowledge, a possible solution is to provide an induction session for students. Is it effective/sensible/practical? Why?
  
- iii. To ensure that parents are well informed about the implementation which will eventually foster their support, other than the usual method of informing parents by documents (letters); possible solutions are to conduct parents' night and school visits. Is it effective/sensible/practical? Why?

Q3. There is a need to prevent negative implications of utilising mobile phones on student such as security issue (example: theft of the device), safety issue (example: health issues such as repetitive stress injury) and ethical issue (example: inappropriate use of the device). (Other examples: classroom issues, cyber bullying, health issues, communication skills issues, domestic issues, ethical issues and damage, lost and theft).

- i. To prevent these issues from happening to students, possible solution is to introduce induction session to raise students' awareness about these issues. Is it effective/sensible/practical? Why?
  
- ii. In addition to induction, to prevent ethical issues from happening to students, possible solution is to apply an Acceptable Use Policy (AUP). Is it effective/sensible/practical? Why?

Q4. Do you have anything else to add?

**Appendix H: Interview schedule for ICT subject leaders in the main field tests**

**Version: Main field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (ICT subject leader)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the ICT subject leader in Malaysia.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. There is a need to assign or assume specific roles at schools to support the implementation

- i. To manage and maintain the devices in the implementation, help desk/ technical support will be introduced. Is there any issue/problem that you can see from this suggestion? Why?
- ii. In managing and maintaining the devices in the implementation, students will also contribute as maintenance assistant. Is there any issue/problem that you can see from this suggestion? Why?

Q2. Management and maintenance are also important in the implementation.

- i. To deal with the faults of the device, students and parents will be asked to contribute towards:
  - a) Insurance/ warranty
  - b) Payment for the repair.Is there any issue/problem that you can see from this suggestion? Why?
- ii. To prevent cases of lost and damage:
  - a) Loan agreement,
  - b) Acceptable use policy will be introduced.Is it effective/sensible/practical? Why?
- iii. To prevent cases of theft, other than usual procedure such as locking the devices and securing the devices with security number, device tracking mechanism will be introduced. Is there any issue/problem that you can see from this suggestion? Why?

Q3. Do you have anything else to add?

**Appendix I: Interview schedule for English subject leaders in the main field tests**

**Version: Main field tests**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (English subject leader)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the English subject leader in Malaysia.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. Mobile lessons through SMS that consist of the vocabulary explanation, quizzes and a feedback mechanism are suggested for the implementation. After answering quizzes by sending the answers to teachers' number on the computer server, an automatic feedback from the server will be delivered to students. In addition, teachers are able to monitor students' progress via the Students Progress Tracking System.

- i. About the mobile lessons, is the structure pedagogically sound for vocabulary acquisition?
- ii. How to integrate the mobile lessons into the existing curriculum?

Q2. Mobile lesson, which consist of six new words, will be delivered to students 3 times a week, on Monday, Wednesday and Friday at 8 pm for morning session students and at 8 am for afternoon session students.

- i. What is your opinion regarding the schedule in delivering the mobile lessons? Do you think it can fit in with the students' daily activities?
- ii. Will the schedule enable the students to master the lessons?

Q3. There is a need to assign or assume specific roles at schools to support the implementation. What is your opinion about including the English subject leader to support the implementation?

Q4. Do you have anything else to add?

**Appendix J: Interview schedule for officers in the dissemination and distribution stage**

**Version: Dissemination and distribution stage**

***Mobile learning in English Language learning: An implementation strategy for secondary schools in Malaysia***

**Interview Schedule (Officer)**

Date of interview .....

Interview commenced .....

Name of respondent .....

Role of respondent.....

Interview finished .....

**Initial briefing:**

- My name is Mariam Mohamad. I am a PhD student conducting a research in mobile learning at the University of Southampton, UK.
- In my study, I suggest the use of **mobile phones to support English Language vocabulary learning** for secondary school students. The mobile lessons will be delivered to the students through SMS. It will complement the syllabus to support English language subject in schools.
- The purpose of this research is to gather perspective from the officers in the Ministry of Education, Malaysia.
- Ask permission to record the conversation.
- Ask permission to proceed with the first question.

Q1. Many researchers believed that mobile phones have the potential to be used in mainstream schooling. Researchers in Malaysia also have developed various mobile applications for the use of schools' students as well as developing mobile learning curriculum for secondary schools.

In other developing countries such as in Africa and India, mobile phones are used as alternative educational tools in schools. In addition, a school in the UK which is known as Notre Dame High school in Sheffield also follows this practice.

- (i) Do you believe that mobile phones have the potential to be used as an alternative educational tool in Malaysian schools? Why?

Q2. The Ministry of Education has introduced various approaches to support students in English Language subject for example through ETEMS and encouraging the use of ICT for English teaching and learning. Recently the government has announced that they will introduce the element of fun in English curriculum through MBMMBI.

- (i) Do you believe that the use of mobile phones would provide alternatives in improving command of the English language in Malaysian schools? Why?

Q3. From the vision of the Malaysian Smart School implementation, mobile technology is one of the tools that were aimed to be used. Recently, Dr Norrizan Razali an officer from Smart School Department, Multimedia Development Corporation in Malaysia stated the prospect of smart phones to be used in schools.

- (i) Do you believe that the use of mobile phones in teaching and learning would fulfil the vision of the Malaysian Smart School to utilise mobile technology? Why?

Q4. The Ministry of Education encouraged the use of ICT in teaching and learning. This has been highlighted by the Ministry of Education in Malaysian schools' ICT policy where ICT is encouraged to be used in teaching and learning.

- (i) Do you believe that the use of mobile phones in teaching and learning would also fulfil the Malaysian schools' ICT policy? Why?

Q5. Do you have anything else to add? For example, about the implementation strategy and other issues associated with mobile learning implementation?

