Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
Effectiveness of Text-based Mobile Learning Applications:

Case Studies in Tertiary Education

A Thesis

Presented to

The Academic Faculty

By

Lei (Pluto) Wang

Under the Supervision of

Dr. Hokyoung Ryu

Submitted in partial fulfilment

of the requirements for the Degree

Master of Information Sciences in Information Technology

Massey University

30\textsuperscript{th} April. 09
ABSTRACT

This research focuses on developing a series of mobile learning applications for future ‘beyond’ classroom learning environments. The thesis describes the general use pattern of the prototype and explores the key factors that could affect users’ attitudes towards potential acceptance of the mobile learning applications. Finally, this thesis explores the user acceptance of the mobile learning applications; and investigates the mobility issue and the comparison of applying learning activities through mobile learning and e-learning.
# TABLE OF CONTENTS

ABSTRACT .................................................................................................................. i

TABLE OF CONTENTS ............................................................................................. iii

LIST OF FIGURES ...................................................................................................... vii

LIST OF TABLES ........................................................................................................ ix

STATEMENT OF ACADEMIC INTEGRITY ............................................................... xi

ACKNOWLEDGEMENTS ............................................................................................ xiii

Chapter 1: Introduction and Background ................................................................. 1

1.1 Introduction to the Study .................................................................................... 1

1.2 Background to the Study .................................................................................. 3

1.2.1 Definition of Mobile Learning ................................................................. 3

1.2.2 Why Mobile Learning? ............................................................................. 5

1.2.3 Learning Activities outside the Classroom .............................................. 8

1.3 Research Questions and Potential Contributions .......................................... 11

1.4 Outline of the Thesis ....................................................................................... 13

Chapter 2: Literature Review .................................................................................. 15

2.1 M-learning vs. E-learning ................................................................................ 16

2.2 Mobility as a Key Concern ............................................................................. 22

2.3 Mobile Learning implies Learning Activities outside the Classroom ........... 24

2.4 Summary of Literature and Implications of Studies ...................................... 30

Chapter 3: Methodology ......................................................................................... 31

3.1 The Experiments ............................................................................................... 31

3.2 Apparatus ......................................................................................................... 34
6.4 Future Work ........................................................................................................71

References

Appendix A: Screenshots of E-learning Tool............................................................. I

Appendix B: Screenshots of “Learning beyond Classroom” Applications......... III
  Review ....................................................................................................................III
  Preview .............................................................................................................. VII

Appendix C: Source Codes of “Learning beyond Classroom” Applications ...... XI
  Review ................................................................................................................XI
  Preview .......................................................................................................... XVIII

Appendix D: Questionnaires .................................................................................. XXIII
  Experiment 1: Questionnaires (E-learning vs. Mobile Learning).......... XXIII
  Experiment 2: Questionnaires (In classroom vs. Beyond classroom) ......XXIV
  Experiment 3&4: Questionnaires (Different Time) ................................. XXV
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Suchart Kittanaseeree’s m-learning course</td>
<td>7</td>
</tr>
<tr>
<td>1.2</td>
<td>My Sports Pulse</td>
<td>7</td>
</tr>
<tr>
<td>2.1</td>
<td>Screenshot of “Mobile Game”</td>
<td>26</td>
</tr>
<tr>
<td>2.2</td>
<td>Scene of “One Day Trip with PDA”</td>
<td>27</td>
</tr>
<tr>
<td>2.3</td>
<td>Example pages from Thornton and Houser’s research</td>
<td>29</td>
</tr>
<tr>
<td>3.1</td>
<td>Nokia 7610 (© Jørgen Sundgot)</td>
<td>34</td>
</tr>
<tr>
<td>3.2</td>
<td>Screenshot of mobile applications sent by e-mail</td>
<td>35</td>
</tr>
<tr>
<td>4.1</td>
<td>Ease to learn</td>
<td>46</td>
</tr>
<tr>
<td>4.2</td>
<td>Simple usage</td>
<td>47</td>
</tr>
<tr>
<td>4.3</td>
<td>Convenience</td>
<td>48</td>
</tr>
<tr>
<td>4.4</td>
<td>Utility</td>
<td>49</td>
</tr>
<tr>
<td>4.5</td>
<td>Attitude to use</td>
<td>50</td>
</tr>
<tr>
<td>4.6</td>
<td>Suitability</td>
<td>53</td>
</tr>
<tr>
<td>4.7</td>
<td>Convenience</td>
<td>54</td>
</tr>
<tr>
<td>4.8</td>
<td>Attitude to use</td>
<td>55</td>
</tr>
<tr>
<td>5.2</td>
<td>Comparison between m-learning and e-learning</td>
<td>62</td>
</tr>
<tr>
<td>5.3</td>
<td>The result of Experiment 2</td>
<td>64</td>
</tr>
<tr>
<td>5.4</td>
<td>Additional analysis to compare review vs. preview</td>
<td>65</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 1.1 Current learning activities (In/ Beyond classroom learning) ........................ 9
Table 2.1 Comparison of e-learning and m-learning (Sharma and Kitchens, 2004; Nash, 2007) .............................................................. 19
Table 3.1 The number of participants for each experiment ........................................... 38
Table 3.2 Experimental design of the first experiment .................................................... 39
Table 3.3 Experimental design of the second experiment .............................................. 39
Table 3.4 Experimental design of Experiment 3 ............................................................ 40
Table 3.5 Experimental design of Experiment 4 ............................................................ 40
Table 3.6 Details of experiment design ....................................................................... 41
Table 4.1 E-learning vs. m-learning ............................................................................. 45
Table 4.2 In the classroom vs. out of the classroom ...................................................... 52
Table 4.3 Review-based learning at different times ....................................................... 56
Table 4.4 Preview-based learning at different times ..................................................... 58
Table 4.5 Review-based learning vs. preview-based learning ...................................... 59
Table 5.1 Summary table of research questions and answers ..................................... 61
STATEMENT OF ACADEMIC INTEGRITY

I declare that this research study is entirely the product of my own work and that it has not been taken from the work of others. When the work and ideas of others has been used in the study, the work has been properly cited in the text.

______________________________

Lei (Pluto) Wang
ACKNOWLEDGEMENTS

I owe a great deal of gratitude to people who, in various ways, helped to make this project possible. Particularly, I would like to thank my supervisor Dr Hokyoung Ryu for providing me with this opportunity. Thank you for your guidance, your revisions and patience with my questions in stressful times. I would also like to mention my family and my dear friends and flatmates (SuyiGuo, Liye Zhang and Ting Yue) for providing me with support whenever I need it and brightening up my year.