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# **Personality Effect in the Design of Adaptive E-learning Systems**

A thesis presented in partial  
Fulfilment of the requirements

For the degree  
Of Doctor of Philosophy

In Information System at  
Massey University

Amal Al-Dujaily  
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## ABSTRACT

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This PhD thesis is a theoretical and practical study concerning the user model for adaptive e-learning systems. The research activity is two-fold. It firstly explores the personality aspect in the user model which has been overlooked in the previous literature on the design of adaptive e-learning systems, in order to see whether learners with different types of personality would have different effects on their learning performance with adaptive e-learning systems. And secondly, it investigates how to embody the personality features in the current user model, proposing that the inclusion of the personality in the user model for adaptive e-learning systems would lead to better learning performance.

The thesis has considered the personality aspect in four parts. PART I reviews the theoretical and empirical literature on adaptive e-learning systems from which the main research questions are constructed. It explains how this study derives an overarching model for the inclusion of personality type in effective e-learning systems.

PART II consists of the experiments, which explore empirically the importance of identifying the personality in the user model for adaptive e-learning and its effect in individual learning. That is, the main theme of the thesis hypothesises that different personality type's influence performance with e-learning systems.

PART III shows the effects of personality type on groups of learners performing collaborative learning activities. It suggests practical implications of designing collaborative learning technologies in conjunction with the personality feature.

Finally, PART IV includes personality in the proposed user model and tests the primary hypothesis that “the personality may influence the learning performance of students using adaptive e-learning systems”.

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# CONTENTS

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<i>Abstract</i>	<i>i</i>
<i>Contents</i>	<i>ii</i>
<i>List of Figures</i>	<i>vii</i>
<i>List of Tables</i>	<i>ix</i>
<i>Preface</i>	<i>xi</i>
<i>Acknowledgements</i>	<i>xii</i>
<i>Declaration</i>	<i>xiv</i>
 <i>Chapter 1. Summary of Thesis</i>	 <i>1</i>
Overview of Research	1
Overview of Thesis	2

## **PART I. Personality model and the literature review**

<i>Chapter 2. Research framework</i>	<i>7</i>
Overview of the Chapter	7
2.1. The main research question	7
2.2. Research framework	10
2.2.1. Stage 1: Understand the role of personality in learning situation	10
2.2.2. Stage 2: Understand the role of personality in adaptive e-learning systems	11
2.2.3. Stage 3: Understand the relation between personality and learning material	12
2.2.4. Stage 4: Understand the relation between personality and collaborative learning	12
2.2.5. Stage 5: Embody personality in the user model	12
2.3. Summary	12

### *Chapter 3. Related literature and research question*

Overview of the Chapter	13
3.1. Introduction	14
3.2. Traditional e-learning systems: Hypermedia Systems (HS)	15
3.3. AHSs: An advance on HSs	18
3.4. Applications of AHSs: Authoring tools	21
3.5. User models and AHSs	26
3.6. Personality and user models	33
3.7. Conclusions and discussion	38

## **PART II. Experiments to understand the role of personality in the e-learning systems**

### *Chapter 4. A comparative study of personality effect on traditional e-learning and adaptive e-learning systems*

Overview of the Chapter	40
4.1. Personality effect on traditional e-learning systems	41
4.2. Experiment 1: Personality and traditional e-learning system	44
4.2.1. Method	45
4.2.1.1. Participants	45
4.2.1.2. Apparatus	46
4.2.1.3. Experiment design	47
4.2.1.4. Procedure	47
4.2.2. Results and discussion	48
4.3. Experiment 2: Personality and an adaptive e-learning system	51
4.3.1. Method	51
4.3.1.1. Participants	51
4.3.1.2. Apparatus/design/procedure	52

4.3.2. Results and discussion	53
4.4. General discussion	56
<i>Chapter 5. Other personality traits and learning performance</i>	58
Overview of the Chapter	58
5.1. Other personality types and their potential effects	58
5.2. Experiment 3	61
5.2.1. Method	62
5.2.1.1. Participants/apparatus/design/procedure	62
5.2.2. Results	63
5.3. Conclusions and discussion	66
<i>Chapter 6. Personality and the learning material design</i>	68
Overview of the Chapter	68
6.1. Personality types and learning material structures	68
6.2. Experiment 4	72
6.2.1. Participants	74
6.2.2. Apparatus	75
6.2.3. Experiment design	75
6.2.4. Procedure	76
6.2.5. Results	76
6.3. General conclusions and discussion	82
<b><u>PART III. To understand collaborative learning and personality types</u></b>	
<i>Chapter 7. Collaborative learning and personality</i>	85
Overview of the Chapter	86
7.1. Personality and collaborative learning	86

<b>7.2. Experiment 5</b>	<b>89</b>
7.2.1. Participants	90
7.2.2. Apparatus	90
7.2.3. Experiment design	91
7.2.4. Procedure	92
7.2.5. Results	92
<b>7.3. Conclusions</b>	<b>96</b>

## **PART IV. Personality type in the proposed user model**

### *Chapter 8. Encompassing the personality effect in adaptive e-learning systems*

<i>design</i>	<b>99</b>
<b>Overview of the Chapter</b>	<b>99</b>
<b>8.1. Personality in the user model of adaptive e-learning systems</b>	<b>99</b>
<b>8.2. A proposed user model with the personality type</b>	<b>101</b>
<b>8.3. Experiment</b>	<b>102</b>
<b>8.3.1. Method</b>	<b>102</b>
8.3.1.1. Participants	102
8.3.1.2. Apparatus	103
8.3.1.3. Experiment design	105
8.3.1.4. Procedure	105
<b>8.3.2. Results</b>	<b>105</b>
<b>8.4. General conclusions and discussion</b>	<b>106</b>

### *Chapter 9. Conclusions and discussion*

<b>9.1. Summary of this thesis</b>	<b>110</b>
<b>9.2. Contributions</b>	<b>113</b>
9.2.1. Contributions of the thesis to adaptive e-learning	113
9.2.2. Contribution to pedagogy and teaching practice	116

9.3. Limitations	116
9.4. Future work	117
<i>References</i>	<i>119</i>
 <i>Appendix 1: Experiment 1</i>	 <i>A-1</i>
Appendix 1.1. Short introduction on elm-art system	A-1
Appendix 1.2. Intro-questionnaire	A-2
Appendix 1.3. The paper test	A-3
Appendix 1.4. Some figures of the apparatus	A-5
 <i>Appendix 2: Experiments 2 and 3</i>	 <i>A-11</i>
Appendix 2.1. The introduction with the intro questionnaire web page	A-11
Appendix 2.2. Experiments 3 and 4 web pages	A-12
 <i>Appendix 3: Experiment 4</i>	 <i>A-17</i>
Appendix 3.1. Introduction on Haskell	A-17
Appendix 3.2. Experiments web pages	A-18
Appendix 3.3. Some figures of the apparatus	A-20
Appendix 3.4. Haskell test	A-23
 <i>Appendix 4: Experiment 5</i>	 <i>A-26</i>
Appendix 4.1. Login procedure	A-26
Appendix 4.2. Some figures from the theory and the practical part windows	A-29



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## LIST OF FIGURES

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<i>Figure 1.1. Overall structure of the thesis and contents</i>	2
<i>Figure 2.1. The user model</i>	9
<i>Figure 2.2. The research plan</i>	10
<i>Figure 3.1. InterBook</i>	23
<i>Figure 3.2. (a) The transistor lesson in WHURLE</i>	24
<i>Figure 3.2. (b) NetCoach</i>	24
<i>Figure 3.3. KBS Hyperbook</i>	25
<i>Figure 3.4. The user model of an AHS</i>	27
<i>Figure 4.1. A Web-based e-learning system for teaching LISP</i>	47
<i>Figure 4.2. Time taken in the traditional e-learning use situation</i>	48
<i>Figure 4.3. ELM-ART used in Experiment 2</i>	52
<i>Figure 4.4. Time taken using the adaptive e-learning</i>	55
<i>Figure 6.1. Haskell 1</i>	72
<i>Figure 6.2. The structure of Haskell 1</i>	73
<i>Figure 6.3. Haskell 2</i>	73
<i>Figure 6.4. The structure of Haskell 2</i>	74
<i>Figure 6.5. Knowledge structure map: An example of weak performance (a) and good Performance</i>	81

<i>Figure 7.1. Theory part of the system</i>	91
<i>Figure 7.2. Practical part of the system</i>	91
<i>Figure 7.3. Task performances time taken</i>	92
<i>Figure 7.4. Task performances (correct answers %) of the 4 different groups</i>	93
<i>Figure 8.1. A proposed user model</i>	102
<i>Figure 8.2. The MBTI questionnaire test</i>	104
<i>Figure 8.3. The experimental setting</i>	104
<i>Figure 9.1. The overall thesis structure</i>	110

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## LIST OF TABLES

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<i>Table 3.1. Some examples of ITSs</i>	17
<i>Table 3.2. Several AHSs</i>	20
<i>Table 3.3. Authoring systems for AHSs</i>	22
<i>Table 3.4. Characteristics being used in the AHSs</i>	28
<i>Table 3.5. The four MBTI preferences and the basic definition of the preference</i>	35
 <i>Table 4.1. Background Experience of Omani Learners (Experiment 1)</i>	 46
<i>Table 4.2. Time taken (mean/s.d)</i>	49
<i>Table 4.3. Other task performance (mean/s.d)</i>	49
<i>Table 4.4. Background experience of Omani learners (Experiment 2)</i>	52
<i>Table 4.5. Overall task performance in Experiment 2</i>	53
<i>Table 4.6. Personality effects on the traditional and adaptive e-learning system</i>	53
<i>Table 4.7. Other measures of task performance in Experiment 2</i>	54
<i>Table 4.8. Time taken (mean/s.d)</i>	55
 <i>Table 5.1. The relationship between learning style and preferred learning material design</i>	 60
<i>Table 5.2. Comparison of background experience of both Omani participants and New Zealand participants</i>	61
<i>Table 5.3. The participants in Experiment 3</i>	61
<i>Table 5.4. Personality effects on an adaptive e-learning system in both Oman and New Zealand (mean/s.d)</i>	63
<i>Table 5.5. The task performance in other personality types</i>	65

<i>Table 6.1. The participants of Experiment 4</i>	75
<i>Table 6.2. Task performance in Haskell 1</i>	76
<i>Table 6.3. Task performance in Haskell 1 (Depth-first)</i>	77
<i>Table 6.4. Task performance in Haskell 2</i>	78
<i>Table 6.5. Task performance in Haskell 2 (Breadth-first)</i>	78
<i>Table 6.6. Number of participants who revisited the previous pages for Haskell 1</i>	79
<i>Table 6.7. Number of participants who revisited the previous pages in Haskell 2 use</i>	79
<i>Table 6.8. Cognitive map for Haskell 1/Haskell 2</i>	81
<i>Table 7.1. Participants in this experiment</i>	90
<i>Table 7.2 Two classifications of Nielson's rules</i>	95
<i>Table 7.3. Numbers of revisited on both difficult and easy rules (mean/s.d)</i>	96
<i>Table 8.1. The participants of Experiment 6</i>	103
<i>Table 8.2. Summary of task performance of Experiment 6</i>	105

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## PREFACE

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This PhD is concerned with including the personality type in the user model which has been less thoroughly investigated in the previous studies of adaptive e-learning systems.

The thesis has considered and covered the personality effect in adaptive e-learning systems in four parts. PART I covered the theoretical and empirical literature on adaptive e-learning systems. PART II investigated and empirically showed the importance of identifying the personality in the user model for adaptive e-learning systems and its effect on individual learning. PART III considered and showed the effects of personality on the group of learners performing collaborative learning, and finally PART IV empirically included the personality in the proposed user model and assessed the assumption that the personality feature in the user model would influence the learning performance of students using adaptive e-learning system and conclusions are drawn regarding the thesis.

This study took place between 2002 and 2007 in the Institute of Information and Mathematical Science at Massey University. Both Prof. Scott Overmyer and Dr. Hokyoung Ryu supervised the thesis.

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## DECLARATION

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I declare the research reported in this thesis to be my own, with the help of my supervisors both Prof. Scott Overmyer and Dr. Hokyoung Ryu. The research completed between July 2002 and 2007 in the Institute of Information and Mathematical Science, Massey University.

Chapter 3,4,5,6 and 7 of the thesis were presented and published at the International Conference on Advanced Learning Technologies (ICALT), in, 2005, 2006 and 2007, respectively. Also, a paper is in preparation for submission to the Journal of Technology Education (JTE).

Chapter 3 and 4 of the thesis were also presented and published in the doctoral consortium of Australian Computer Information Systems (ACIS), in 2005.

- Al-Dujaily, A., & Ryu, H. (2007). *Personality and collaborative learning experience*. Paper presented at the 7th IEEE International Conference on Advanced Learning Technologies (ICALT 2007). Niigata, Japan.
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- ACIS 2005 Doctoral Consortium: November 28-29, 2005. The Australasian Conference on Information Systems (ACIS). University of Technology, Sydney (UTS), Australia.
- I presented my work as an invited speaker at the Centre for University Preparation and English Language Studies (CUPELS) seminar, on the 26 April 2007.