

**THE EFFECTS OF INTEGRATED JOURNAL
DISCUSSION BOARD (IJDB) ON STUDENTS'
MOTIVATIONAL BELIEFS AND SELF-
REGULATED LEARNING STRATEGIES IN
HIGHER EDUCATION**

by

FUNG CHORNG YUAN

**Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy**

September 2018

ACKNOWLEDGEMENT

Firstly, I would like to thank and praise my Almighty God who has empowered me in all aspects to complete this study.

Secondly, I would like to thank my main supervisor, Associate Professor Dr. Melissa Ng Lee Yen Abdullah and my co-supervisor, Associate Professor Dr. Shahabuddin bin Hashim, for their time, patience, endless support and encouragement for me to complete this study. My thank also goes to Professor Dr. Hairul Nizam bin Ismail, Dr. Amelia Binti Abdullah and Dr. Rosniza Binti Zaharudin for their invaluable comments, feedbacks and suggestions on my thesis.

Thirdly, I would like to express my heartfelt thanks to my dearest wife, Ng Boon Yiah, who has sacrificed so much in order to accommodate my busy schedule and workload during my study. My appreciation goes to my three boys, Alfred, Emmanuel and Aloysius, for their patience and understanding throughout my study.

I would like to take this opportunity to thank the Pro-Vice Chancellor and CEO of Swinburne University of Technology Sarawak, Professor Janet Gregory, my Dean of Faculty, Professor Dr. Lee Miin Huui, Director of Research and Consultancy, Associate Professor Dr. Wallace Wong, for their support in granting me study leave to complete my thesis as well as the permission to carry out the research in the university. My special thanks go to Ms. Su Sueh Ing who has kindly allowed me to use her unit and students as the site for this study.

Last, but not least, I thank my friends, church members, pastors and colleagues who have given me encouragement in many ways and prayer support. May God bless you all.

TABLE OF CONTENTS

ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	xiii
LIST OF FIGURES	xvi
LIST OF ABBREVIATION	xvii
ABSTRAK	xix
ABSTRACT	xxi
CHAPTER 1 - INTRODUCTION	
1.1 Introduction	1
1.2 Background of Study	1
1.3 Problem Statement	7
1.4 Research Objectives	10
1.5 Research Questions	11
1.6 Hypotheses	11
1.7 Significance of Research	13
1.8 Definition of terms	
1.8.1 Self-Regulated Learning (SRL)	15
1.8.1(a) Cognitive Strategies	15
1.8.1(b) Metacognitive Strategies	16
1.8.2 Motivational Beliefs	16
1.8.2(a) Intrinsic Goal Orientation	16

1.8.2(b) Extrinsic Goal Orientation	17
1.8.2(c) Task Value	17
1.8.2(d) Control of Learning Beliefs	17
1.8.2(e) Self-efficacy for Learning and Performance	17
1.8.3 Integrated Journal Discussion Board (IJDB)	18
1.8.4 E-Learning Journal	19
1.8.3 Asynchronous Discussion Board	19
1.9 Limitations of Study	19
1.10 Summary	20

CHAPTER 2 – LITERATURE REVIEW

2.1 Introduction	21
2.2 Related Theories	21
2.2.1 Social Cognitive Theory	21
2.2.2 Information Processing Theory	23
2.2.3 Sociocultural Theory	26
2.2.4 SRL and Feedback Model	26
2.2.5 Theoretical Framework	28
2.3 Learning at Higher Education	29
2.4 University Students' Self-Regulated Learning (SRL) Skills	30
2.5 Self-regulated Learning and Academic Achievement	32
2.6 Self-Regulated Learning Interventions in Higher Education	34
2.6.1 The Stand-alone Program	35
2.6.2 The Embedded Program	38

2.7	Learning Journals as Intervention	38
2.8	Feedback and Interaction on Asynchronous Discussion Board	44
2.9	Computer-Aided Learning in Higher Education	45
2.10	ICT tools for Self-reflection, Self-evaluation and Self-monitoring	47
2.11	Conceptual Framework	49
2.12	Summary	50

CHAPTER 3 – RESEARCH METHODOLOGY

3.1	Introduction	51
3.2	Research Design	51
3.3	Research Variables	56
3.3.1	Dependent Variables	57
3.3.1(a)	Motivational Beliefs	57
3.3.1(b)	Self-Regulated Learning (SRL) Strategy Use	57
3.3.2	Independent Variable or the Treatment	57
3.4	Research Procedures	58
3.5	Sampling and Sampling Techniques	60
3.5.1	Criteria for Sample Selection	61
3.5.1(a)	Unit of Study	61
3.5.1(b)	The Participants	61
3.6	Validity of Quasi-Experimental Study	62
3.6.1	Internal Validity Threats	63
3.6.1(a)	Subject Characteristic Threat	63

3.6.1(b)	Testing Threat	63
3.6.1(c)	Reactivity and Experimenter Effect	64
3.6.2	External Validity Threats	65
3.6.2(a)	Population Threat	65
3.6.2(b)	Ecological Threat	65
3.7	Research Instrument	65
3.7.1	Motivated Strategies for Learning Questionnaire (MSLQ)	65
3.7.1(a)	Intrinsic Goal Orientation	67
3.7.1(b)	Extrinsic Goal Orientation	68
3.7.1(c)	Task Value	68
3.7.1(d)	Control of Learning Beliefs	68
3.7.1(e)	Self-efficacy for Learning and Performance	68
3.7.1(f)	Rehearsal	69
3.7.1(g)	Elaboration	69
3.7.1(h)	Organisation	69
3.7.1(i)	Critical Thinking	69
3.7.1(j)	Metacognitive Self-Regulation	70
3.7.2	e-Learning Journal	70
3.7.3	Email and Face-to-face Interviews of Lecturer	70
3.8	Data Analysis	72
3.8.1	Quantitative Data	72
3.8.1(a)	Descriptive Analysis	72
3.8.1(b)	Inferential Analysis	73

3.8.2	Qualitative Data	73
3.8.2(a)	Organise the Data	73
3.8.2(b)	Immerse in the Data	74
3.8.2(c)	Coding the Data	74
3.8.2(d)	Categorisation of Themes	74
3.8.2(e)	Analysis and Interpretation	75
3.9	Pilot Study	75
3.9.1	Trial Run of IJDB	76
3.9.2	Reflection from the Pilot Study	78
3.10	Rationale of Integrated Journal Discussion Board (IJDB)	79
3.11	Strength of IJDB	81
3.12	Components of IJDB	82
3.13	Weekly e-Learning Journal (e-LJ)	84
3.13.1	Weekly Study Tips	86
3.13.2	Weekly Self-Reflection	89
3.13.3	Weekly Self-Monitoring	91
3.13.4	Weekly Self-Assessment of IJDB	92
3.14	The Creation of e-LJ on Blackboard®	93
3.15	Summary of e-LJ	98
3.16	Asynchronous Discussion Board (ADB)	99
3.16.1	Functions of ADB	99
3.16.2	Summary of ADB	103
3.17	Application of IJDB in Teaching and Learning Process	104

3.17.1	Stage One – Acquiring Learning Experience	105
3.17.2	Stage Two – Reflection in e-LJ	106
3.17.3	Stage Three – Reflection on Teaching	106
3.17.4	Stage Four – Engaging Discussion for Improvement	107
3.18	Validation of IJDB	107
3.19	Summary	107

CHAPTER 4 – RESULTS

4.1	Introduction	108
4.2	Data Screening	108
4.3	Assumptions Testing	108
4.3.1	Normality of Data	108
4.3.2	Levene’s Test for Equality of Variance	109
4.4	Use of IJDB in Improving Motivational Beliefs	109
4.4.1	Descriptive Statistics of Pre-test and Post-test Motivational Beliefs	110
4.4.2	The Effect of Integrated Journal Discussion Board in Improving Students’ Motivational Beliefs Scores	110
4.5	Use of IJDB in Improving SRL Strategies Use	118
4.5.1	Descriptive Statistics of Pre-test and Post-test SRL strategy use	118
4.5.2	The effect of Integrated Journal Discussion Board in Improving Students’ SRL Strategies	119
4.6	Brief Comparison of Pre-test and Post-test Mean Scores in Motivational Beliefs and SRL Strategies Use	126

4.7	Changes of Motivational Beliefs and SRL over the Intervention Period	127
4.7.1	Time Series of Weekly Self-efficacy Mean Scores	128
4.7.1(a)	One-Way Repeated Measures of ANOVA Test	128
4.7.2	Time Series of Weekly Self-Motivation Mean Scores	130
4.7.2(a)	One-Way Repeated Measures of ANOVA Test	131
4.7.3	Comparison of Self-Efficacy and Self-Motivation Changes	132
4.7.4	Time Series of Weekly Study Plan Mean Scores	133
4.7.4(a)	One-way Repeated Measures of ANOVA Test	135
4.7.5	Time Series of Weekly Mean Scores for <i>Sufficient Study Time</i>	135
4.7.5(a)	One-way Repeated Measures of ANOVA Test	136
4.7.6	Time Series Analysis of Weekly Scores of ' <i>Perceived Sufficient Study Effort</i> '	137
4.7.6(a)	One-Way Repeated Measures of ANOVA Test	138
4.7.7	Time Series of Weekly Mean Scores of ' <i>Understanding of Topics to-date</i> '	139
4.7.7(a)	One-Way Repeated Measures of ANOVA Test	140
4.7.8	Time Series of Weekly Mean Scores of ' <i>Perceived Usefulness of Weekly e-Learning Journal</i> '	142
4.7.8(a)	One-Way Repeated Measures of ANOVA Test	143
4.7.9	Comparison of SRL Strategies, Motivational Beliefs and Perceived Usefulness of e-LJ	144
4.8	Students' Utilisation of IJDB	148
4.8.1	Weekly Study Tips and Survey	148
4.8.2	Self-reflection to Learn Better	151

4.8.2(a)	Study Planning	151
4.8.2(b)	Verbal Persuasion	153
4.8.2(c)	Stress Management	154
4.8.2(d)	Help-Seeking	155
4.8.2(e)	Peer Learning	156
4.8.2(f)	Metacognitive Strategies	158
4.8.2(g)	Cognitive Strategies	159
4.8.2(h)	Management of Study Environment	160
4.8.2(i)	Time Management	160
4.8.3	Comparison of IJDB Utilisation on Motivational Beliefs and SRL Strategies	161
4.8.4	Help-Seeking Sources	161
4.8.4(a)	Students' Help-Seeking Choices and Motivational Beliefs	162
4.8.4(b)	Students' Help-Seeking Choices and SRL strategies	162
4.8.5	Students' Overall View on Usefulness and Limitations of IJDB	163
4.8.5(a)	Metacognitive Strategies Usage	164
4.8.5(b)	Practise Rehearsal	164
4.8.5(c)	Improve Self-Efficacy	164
4.8.5(d)	Weekly Study Tips	165
4.8.5(e)	Peer Learning	165
4.8.5(f)	Help-Seeking	166

4.8.6	Triangulation of Data from e-LJ and ADB	166
4.8.7	Practical Application of IJDB	167
4.8.5(a)	Practical Application of e-LJ	167
4.8.5(b)	Practical Application of ADB	168
4.8.8	Changes in Learning from the Use of e-LJ and/or ADB	169
4.9	Lecturer's View on IJDB	170
4.9.1	Lecturer's View on Weekly e-LJ	171
4.9.2	Lecturer's View on ADB	173
4.9.3	Challenges of IJDB Implementation	174
4.10	Summary of Results	175
4.11	Summary	177

CHAPTER 5 – DISCUSSION, IMPLICATIONS AND CONCLUSIONS

5.1	Introduction	178
5.2	Triangulation of Quantitative and Qualitative Data	180
5.3	Effectiveness of IJDB in Improving Motivational Beliefs	180
5.4	Effectiveness of IJDB in Improving SRL	193
5.5	Changes of Motivational Beliefs and SRL over the Intervention Period	196
5.6	Students' View of IJDB	200
5.7	Lecturer's Perceptions of IJDB	204
5.8	Summary of Discussion	207
5.9	Implications of This Research	209
5.10	Contribution of This Research	210

5.10.1	Theoretical Contribution	210
5.10.2	Educational Contribution	212
5.11	Suggestions for Future Studies	213
5.12	Conclusions	215
REFERENCES		217
APPENDICES		
PUBLICATIONS IN PRINT AND PRESENTATION		

LIST OF TABLES

		Page
Table 2.1	Mapping Web-Based Pedagogical Tools to Self-Regulatory Processes (adapted from Dabbagh & Kitsantas, 2004)	25
Table 2.2	Web-Based Pedagogical Tools and their uses	47
Table 3.1	Summary of Research Questions, Data Collection and Data Analysis Methods	56
Table 3.2	Number of Subjects or Respondents for Each Data Collection Method	62
Table 3.3	Scales and subscales of MSLQ	66
Table 3.4	Cronbach Alpha Reliability Coefficient Values (n = 30)	67
Table 3.5	Email and Fact-to-face Interview Protocols	71
Table 3.6	Two-Stage Analysis of Qualitative Data	75
Table 3.7	Content and Purposes of Weekly e-LJ	86
Table 3.8	Weekly Study Tips and Purposes	87
Table 3.9	Open-ended Prompts and Purposes	90
Table 3.10	Weekly Questions on Motivational Beliefs and SRL Strategies	92
Table 3.11	Self-Assessment Questions on IJDB	93
Table 4.1	Descriptive Statistics of sub-dimensions of Motivational Beliefs	110
Table 4.2	Paired Sample t-test for Pre-test and Post-test Mean Scores of Motivational Beliefs	111
Table 3.3	Paired Sample t-test for Pre-test and Post-test Mean Scores of Self-Efficacy	112
Table 4.4	Paired Sample t-test for Pre-test and Post-test Mean Scores of Task Value	113
Table 4.5	Paired Sample t-test for Pre-test and Post-test Mean Scores of Control of Learning Belief	114

Table 4.6	Paired Sample t-test for Pre-test and Post-test Mean Scores of Intrinsic Goal Orientation	115
Table 4.7	Paired Sample t-test for Pre-test and Post-test Mean Scores of Extrinsic Goal Orientation	116
Table 4.8	Descriptive Statistics of Self-Regulated Learning (SRL) Strategies and its sub-dimensions	119
Table 4.9	Paired Sample t-test for Pre-test and Post-test Mean Scores of SRL Strategies Use	120
Table 4.10	Paired Sample t-test for Pre-test and Post-test Mean Scores of Metacognitive Strategies	121
Table 4.11	Paired Sample t-test for Pre-test and Post-test Mean Scores of Critical Thinking	122
Table 4.12	Paired Sample t-test for Pre-test and Post-test Mean Scores of Elaboration	123
Table 4.13	Paired Sample t-test for Pre-test and Post-test Mean Scores of Organisation	124
Table 4.14	Paired Sample t-test for Pre-test and Post-test Mean Scores of Rehearsal	125
Table 4.15	Comparison of Pre-test and Post-test Mean Scores of Motivational Beliefs and SRL Strategies Use	127
Table 4.16	Descriptive Statistics of weekly Self-Efficacy scores	129
Table 4.17	One-Way Repeated Measures of ANOVA on Self-Efficacy scores over a 10-week period	129
Table 4.18	Descriptive Statistics for Self-Motivation Weekly Mean Scores	131
Table 4.19	One-Way Repeated Measures of ANOVA on Self-Motivation Mean Scores over a 10-week period	131
Table 4.20	Descriptive Statistics for weekly Mean Scores of Weekly Study Plan	134
Table 4.21	One-Way Repeated Measures of ANOVA on Study Plan Mean Scores over a 10-week period	135
Table 4.22	Descriptive Statistics for Perceived Sufficient Study Time Weekly scores	136

Table 4.23	One-Way Repeated Measures of ANOVA on Study Time for next week mean scores over a 10-week period	137
Table 4.24	Descriptive Statistics for Study Effort Weekly Scores	138
Table 4.25	One-Way Repeated Measures of ANOVA on ‘Perceived Sufficient Study Effort’ scores over a 10-week period	139
Table 4.26	Descriptive Statistics for ‘Understanding of topics to date’ Weekly Scores	140
Table 4.27	One-Way Repeated Measures of ANOVA on ‘Understanding of topics to date’ scores over a 10-week period	141
Table 4.28	Descriptive Statistics for Perceived usefulness of e-LJ Weekly Mean Scores	143
Table 4.29	One-Way Repeated Measures of ANOVA on ‘Perceived Usefulness of e-Learning Journal’ scores over a 10-week period	143
Table 4.30	Study Tips and Perceived Usefulness Rate	149
Table 4.31	Major themes from the analysis of ‘How can I learn better?’	151
Table 4.32	Help-Seeking Sources	161
Table 4.33	Usefulness of e-LJ and ADB	163
Table 4.34	Triangulation of findings of ‘How I can learn better’ (Table 4.31) with Usefulness of IJDB Components (Table 4.34)	167
Table 4.35	Summary of findings from both quantitative and qualitative data	176

LIST OF FIGURES

		Page
Figure 2.1	Theoretical Framework	29
Figure 2.2	Conceptual Framework of Integrated Journal Discussion Board (IJDB)	50
Figure 3.1	Quasi-Experimental Mixed Method Design	54
Figure 3.2	The Period of IJDB use in a Semester	58
Figure 3.3	Outline of Research Procedures	60
Figure 3.4	Conceptual Framework of Integrated Journal Discussion Board (IJDB)	84
Figure 3.5	Cyclical model of cognitive and metacognitive processes involved in journal writing (Adapted from Nückles, Hübner, & Renkl, 2012)	85
Figure 3.6	Survey Function on BlackBoard®	94
Figure 3.7	Build a Survey Function Interface	95
Figure 3.8	Survey Canvas – Choose the types of questions in the e-LJ	96
Figure 3.9	e-LJ located in Lecture Notes Folder	97
Figure 3.10	Content of Weekly e-LJ Folder	98
Figure 3.11	Discussion Board Content	100
Figure 3.12	Discussion Threads in Peer Discussion classified by Topics	101
Figure 3.13	Discussion Thread – Lecturer Posted Questions	102
Figure 3.14	Discussion Thread – Student’s Response	103
Figure 3.15	Four Stages in Integrating e-LJ and Online Discussion Board	105
Figure 4.1	Pre-test and Post-test Scores on Motivational Beliefs and its sub-dimensions	117
Figure 4.2	Pre-Test and Post-Test Scores of SRL Strategies Use and its Sub-dimensions	126

Figure 4.3	Time series of Weekly Self-efficacy Mean Scores	129
Figure 4.4	Time series of Weekly Self-Motivation Mean Scores	130
Figure 4.5	Comparison of Self-Efficacy and Self-Motivation Changes	133
Figure 4.6	Time Series of Weekly ‘Study Plan’ Mean Scores	134
Figure 4.7	Time Series of Weekly Mean Scores for Perceived Sufficient Study Time	136
Figure 4.8	Time series of weekly ‘Perceived Sufficient Study Effort’ Mean Scores	138
Figure 4.9	Time Series of Weekly Mean Scores of ‘Understanding of topics to-date’	140
Figure 4.10	Time series of weekly ‘Perceived Usefulness of e-Learning Journal’ Mean Scores	142
Figure 4.11	Comparison of Change in Study Plan, Study Effort and Study Time	144
Figure 4.12	Comparison of Weekly Mean Scores of Self-efficacy and Perceived Usefulness of e-LJ	146
Figure 4.13	Comparison of Weekly Mean Scores of Understanding of topics, Study Effort and Study Time	147

LIST OF ABBREVIATIONS

ADB	Asynchronous Discussion Board
e-LJ	Electronic Learning Journal
IJDB	Integrated Journal Discussion Board
MB	Motivational Beliefs
MSLQ	Motivated Strategies for Learning Questionnaire
SRL	Self-Regulated Learning

**KESAN PENGGUNAAN JORNAL PAPAN PERBINCANGAN
BERINTEGRASI TERHADAP KEPERCAYAAN MOTIVASI DAN
STRATEGI PEMBELAJARAN KENDIRI DALAM PENDIDIKAN TINGGI**

ABSTRAK

Pendidikan tinggi merupakan suatu platform untuk memupuk pelajar menjadi pelajar seumur hidup (*lifelong learners*). Pelajar diharap dapat menetapkan matlamat pembelajaran sendiri, memilih strategi pembelajaran yang sesuai, menjalankan pemantauan sendiri dan menilai hasil pembelajaran sendiri. Namun demikian, kebanyakan pelajar di pendidikan tinggi belum bersedia untuk menyesuaikan diri dalam pembelajaran yang berpusatkan pelajar ini. Justeru itu, intervensi yang berkesan amat diperlukan untuk membantu pelajar-pelajar meningkatkan kemahiran pembelajaran sendiri. Kajian ini mengkaji kesan Jurnal Papan Perbincangan Berintegrasi (IJDB) terhadap kepercayaan motivasi pelajar dan penggunaan strategi pembelajaran sendiri (SRL) mereka di pendidikan tinggi. Pemboleh ubah-pemboleh ubah ini penting dalam pembelajaran berpusatkan pelajar. IJDB merupakan suatu alat yang terbina dalam Sistem Pengurusan Pembelajaran (LMS) universiti yang dikenali sebagai *Blackboard Learn*. Ia melibatkan kegunaan e-jurnal pembelajaran dan Papan Perbincangan *Asynchronous* (ADB) secara berintegrasi. Kajian ini menggunakan kaedah penyelidikan campuran. Lima puluh empat pelajar telah mengambil ujian pra dan ujian pasca melalui soal selidik *Motivated Strategies for Learning Questionnaire* (MSLQ). Data siri masa tentang kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri turut dikutip sepanjang tempoh intervensi. Perubahan skor ujian pra dan ujian pasca telah dianalisa dengan menggunakan Ujian-t bersandar manakala perubahan data siri masa telah dianalisa melalui Analisis (ANOVA) pengukuran

berulang. Selain daripada itu, graf-graf siri masa telah digunakan untuk mengenal pasti tren dalam data siri masa. Analisis- analisis pra ujian dan pasca ujian bersama dengan data siri masa telah menunjukkan bahawa terdapat kemajuan signifikan dalam kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri sepanjang tempoh intervensi. Keputusan ini menunjukkan bahawa IJDB berkesan dalam meningkatkan kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri. Data kualitatif yang diperoleh daripada Jurnal e-Pembelajaran dan emel pelajar serta temu-bual dengan pensyarah turut menunjukkan bahawa IJDB dapat merancah (*scaffold*) pelajar untuk membuat refleksi, menjalankan pemantauan sendiri dan menilai pembelajaran sendiri dengan lebih berkesan. Hal ini menyumbang kepada keberkesanan IJDB dalam meningkatkan kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri pelajar. Hasil kajian ini menunjukkan bahawa pelajar perlu sentiasa membuat refleksi sendiri bagi meningkatkan kepercayaan motivasi mereka. Ia seterusnya dapat merangsang dan mengekalkan kegunaan strategi pembelajaran sendiri. Tambahan pula, maklum balas daripada pensyarah dan para pelajar adalah penting untuk meningkatkan kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri di peringkat pengajian tinggi. Secara keseluruhannya, kajian ini telah menghasil dan menguji penggunaan IJDB dan membuktikannya sebagai intervensi yang berkesan dalam meningkatkan kepercayaan motivasi dan kegunaan strategi pembelajaran sendiri pelajar universiti.

**THE EFFECTS OF INTEGRATED JOURNAL DISCUSSION BOARD (IJDB)
ON STUDENTS' MOTIVATIONAL BELIEFS AND SELF-REGULATED
LEARNING STRATEGIES IN HIGHER EDUCATION**

ABSTRACT

Higher education is a platform to cultivate students to be lifelong learners. Students are expected to set their own learning goals, select suitable learning strategies, self-monitor and evaluation their learning outcome. However, many students in higher education are not prepared to adapt to such student-centred approach of learning. Hence, effective intervention is needed to improve students' self-regulated learning skills. This study investigated the effect of Integrated Journal Discussion Board (IJDB) on students' motivational beliefs and use of Self-Regulated Learning (SRL) strategies in higher education. These are essential variables of student-centred approach of learning. IJDB was a tool situated in the Learning Management System (LMS) university which is known as Blackboard Learn. It involved the use of e-Learning Journal and Asynchronous Discussion Board (ADB) in integration. This study used a mixed method approach. Fifty-four students have taken the pre-test and post-test using Motivated Strategies for Learning Questionnaire (MSLQ). Time series data on motivational beliefs and SRL strategies were collected over the intervention period. The changes in the pre-test post-test scores were analysed using paired t-test while the changes in the time series were analysed using repeated measures Analysis of Variance (ANOVA). In addition, time series graphs were used to identify the trends in the time series data. The results of pre-test post-test analysis and time series data revealed that there was a significant increase in the motivational beliefs and SRL strategies use over the intervention period. These results suggested that the IJDB was effective in

improving students' motivational beliefs and SRL strategies use. Qualitative data from students' e-Learning Journal and email interviews together with lecturer's email and face-to-face interview revealed that IJDB as able to scaffold the students to self-reflect, self-monitor and self-assess their learning more effectively. These may have contributed toward the effectiveness of IJDB in improving students' motivational beliefs and SRL strategies use in their learning. The outcome from this study suggested that students need constant self-reflection in order to improve their motivational beliefs. This may, in turn, stimulate and sustain the use of SRL strategies. In addition, feedbacks from lecturer and fellow students were of importance to improve motivational beliefs and use of SRL strategies in university. As a whole, this study has developed and tested the use of IJDB and proven that it is an effective intervention in improving university students' motivational beliefs and SRL.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduces the rationale of this research. It provides a brief background of the research, the problem statement, research questions, objectives and the significance of the research. In addition, the chapter also defines the key terminologies used in this research as well as presenting the limitations of the research.

1.2 Background of Study

The main purpose of higher education is to develop human capital that will build the economic and social well-being of a nation. Higher education is to be the impetus to promote lifelong learning among students (Johnston, 2010). Through lifelong learning skills, graduates will be able to sustain the competition in the market place and to contribute effectively to the development of a nation (Roselina, 2009). Lifelong learning requires students to self-regulate their learning (Kementerian Pendidikan Malaysia, 2015). They must set their own goals, select suitable learning strategies, monitor the process of learning and review the learning outcome. These will form a loop where students need to iteratively monitor and adjust their learning strategies.

Due to the rapid development of technology, institutions of higher education are able to utilize more technology in its teaching and learning practices. However, this requires the knowledge and skills of the academics to optimize technology in their teaching practices. In addition, students in higher education need to be more involved

in computer-aided learning (CAL). They must understand and appreciate the benefits that such learning environment, in particular, to cultivate self-regulated learning that are vital for their future.

Self-regulated Learning in Higher Education

In higher education, students are required to take control of their learning (Kementerian Pendidikan Malaysia, 2015). They are expected to set goals, select learning strategies, monitor and review the learning outcome and subsequently adjust their goals and strategies (Bembenutty, 2011; Pintrich, 2004; Schunk & Zimmerman, 2008; Zusho & Edwards, 2011). They are to self-regulate their learning processes and efforts. Self-regulated learning refers to the multi-dimensional processes where the learners actively engaged in learning through the use of strategies in cognition, metacognition and motivation (Pintrich, 1999; Zimmerman, 1989). Self-regulated learning can help students cultivate the habits of taking responsibility over their own learning (Roselina, 2009). This is essential to turn them into lifelong learners when they leave universities and enter the workforce. Ironically, every worker must be a lifelong learner in order to meet the ever-changing environment and increasing job demand (Weinstein, Acee & Jung, 2011). Hence, it can be synthesized that students who have self-regulated learning skills will be lifelong learners, eventually, when they enter the workforce.

Empirical evidence demonstrated that self-regulated learning has significant positive relationship with academic self-efficacy (DiBenedetto & Bembenuty, 2011), learning performance (Cheng, 2011), deep learning approach, critical thinking skills and academic achievement (Moseki & Schulze, 2010). Self-regulated learning is a good predictor of academic achievement in university (Azlina, 2007). Hence it can be

synthesized that self-regulated learning is of essence for students in institutions of higher education. However, students may not be familiar with self-regulated learning (McInnis & James, 2004; Tinnesz, Ahuna & Kiener, 2006). Self-regulated learning can neither be acquired in naturalistic context nor acquired when they grow older (Hofer & Yu, 2003; Ng, 2010; Pintrich, 1999). One needs not only self-regulative knowledge but the motivational beliefs and strategies to deploy the knowledge effectively (Karabenick, 2006; Ng, 2010). However, these self-regulated learning strategies and behavior seldom acquired in a naturalistic context but need to be intentionally trained (Hofer & Yu, 2003; Ng, 2010; Pintrich, 1999).

In the Malaysia Education Blueprint 2015-2025 (Kementerian Pendidikan Malaysia, 2015), the Ministry of Higher Education has made it a requirement that all higher education institutions to incorporate seven soft skills into their undergraduate programmes. These soft skills are communication skills, critical thinking and problem solving skills, team work, lifelong learning and information management skills, entrepreneurship skills, ethics and professional moral and leadership skills. Some of these skills are dependent or even form part of self-regulated learning. Critical thinking, for instance, has been posited as part of the self-regulated learning (Kuiper, Murdock & Grant, 2010; Pintrich, Smith, Gracia & McKeachie, 1991). In problem solving, students need to know the goal of the problem and exercise suitable strategies to solve the problem (Hunt & Ellis, 2004; Schunk, 2012). Effective problem solving strategies require the students to consider all relevant information and be able to utilize suitable ones. Hence information management skills are implicit in the process of problem solving. When the outcomes deviated from planned, the students need to adjust the learning strategies deployed to accommodate changes. Roselina (2009) commented that self-regulated learning is essential to ensure graduates can acquire skills and

knowledge independently. They must be able to search for relevant information and manage them efficiently. This iterative process requires effective self-regulated learning on the part of the students. Self-regulated learning can also be seen as the foundation of lifelong learning where students will utilize after completion of their study (Cheng, 2011; Zimmerman, 2002). However, self-regulated learning may require training in order to be effective. This is essential as students left their secondary education with different level of exposure to self-regulated learning. Hence, it is vital that higher education institutions to establish effective intervention tools or programmes to enhance their self-regulated learning. However, empirical research on the implementation of such interventions in higher education was not found, particularly in Malaysian context.

Ming and Alias (2007) found that majority of the students surveyed, drawn from three local universities in Malaysia, preferred teacher-centred approach to learning. They preferred the teachers to provide all learning materials and guidance. This finding reiterates the importance to have effective interventions for students to be self-regulated learners in higher education.

Interventions of Self-Regulated Learning at Higher Education

In the field of education, the term ‘intervention’ would encompass a planned modification with an aim of achieving a desired outcome (Tilly & Flugum, 1995, in Ervin & Ehrhardt, 2000). The modification may involve the use of a process or tools. Literature reviews show that there were two common approaches in SRL intervention at higher education. The first approach was the establishment of a stand-alone course to teach self-regulated learning skill (Bail, Zhang and Tachiyama, 2008; Rosario, Nunez, Gonzalez-Pienda, Valle, Trigo & Guimaraes, 2010). One of the main

challenges of such approach is that the higher education institutions need more financial resources as well as academic resources devoted to the course (Kementerian Pendidikan Malaysia, 2015). In addition, students might decline to attend additional unit of study that is not directly link or not relevant to their main stream of study. This limits the transfer of learning (Hofer & Yu, 2003).

The second common approach is to utilize certain tools to be embedded into teaching and learning practices (Nilson, 2013). These tools could be knowledge survey, quizzes at the end of each lesson or writing a note at the end of a semester to the next cohort who want to perform well in that unit of study. Many of these tools were aiming at a certain part of the self-regulated learning process. However, a tool that helps students review and reflect on the whole process of learning is learning journal. Learning journal has been widely recognised as a tool that can improve SRL (Ewijk, Fabriz & Buttner, 2015; Schmitz & Wiese, 2006). The main benefit of this approach, as compared to the stand-alone course approach above is that it can be more cost effective. In addition, it can be adapted and incorporated into various unit of study. However, although theoretically sound, the outcomes of the above empirical research were mixed due to the differences in the format or the learning prompts used in writing the learning journals. This put into question whether writing learning journal alone is sufficient to enhance self-regulated learning. The feedback from lecturers is also vital and this cannot be ignored (Ewijk, Fabriz & Buttner, 2015).

Learning Journals and Self-regulated Learning

Fulwiler (1987, cited in Lukinsky, 1990, p.217; Park, 2003) suggested that learning journals can be of great use in educational settings. It can stimulate the use of metacognitive activities, such as inner questioning and self-awareness promotion. In

addition, learning journals can aid to capture the learning episodes and form a basis for reflection (Deakin, Côté & Harvey, 2006). It can be perceived as a tool for connecting thought, feeling and action – a synthesising tool that works from the inside out and from the outside in. Reflection and action will be brought together. A journal will become an objectification of the inner search, an anchor from which to make further explorations (Lukinsky, 1990; Park, 2003).

Based on the above syntheses, it can be suggested that learning journals can be a convenient, economical and effective way to enhance self-regulated learning. Students can use journal writing as a source of reflection and adjust their learning strategies accordingly. The use of journal can also be a cost-effective way to train the students to be self-regulate on their study. In addition, reflection through journal writing can be embedded into the curriculum as an assessment tool (Williams, et al, 2000). Moreover, the use of learning journals can promote transfer of self-regulated learning skills across different units of study. It is ecological to use learning journals irrespective of discipline of study. *Blackboard* has such function as part of the course tools.

In the current technology era, learning journals need to be in electronic form in order to be engaging and attractive to the students. It must be easy to use and with convenient access, e.g. through handphones. Using such electronic mode of journals can also facilitate the lecturers to provide feedback to their students with ease. This can be done through Asynchronous Discussion Board on *Blackboard*. It acts as a platform for further conversations between lecturer and the students and among students themselves. Students learn better through the feedback from the lecturer as well as social learning. Hence writing learning journals should not be seen as an isolated task to improve SRL.

1.3 Problem Statement

From primary to secondary education, students learned in a teacher-centered learning environment and they have brought such learning approach to higher education (Ming & Alias, 2007). They depend on the teachers to sustain their motivational beliefs to learn. However, the shift from teacher-centered to student-centered learning environment in higher education has posed difficulties for students to adapt. Students were not able to manage their own learning and they were not ready to face such a drastic change (Ming & Alias, 2007). Their motivational beliefs were impaired due to lack of proper training of learning skills. Students need to be intentionally trained in order to be self-regulated learners and to sustain their motivational beliefs (Hofer & Yu, 2003; Ng, 2010; Pintrich, 1999). However, even if they have the knowledge about self-regulation on learning, they may not have the motivational beliefs to use them effectively (Karabenick, 2006). This phenomenon will lead to unsatisfactory academic performance and drop-outs. Such undesired outcome may ultimately shape workforce that is less adaptive to changes and less productive. These repercussions put our higher education and economy at a disadvantage in today's competitive global environment. Roselina (2009) reported that selected employers were not satisfied with our university freshmen due to lack of skills to adapt and to learn.

With the emergence of global economy, the lack of self-regulated learning strategies and the knowledge to sustain their motivational beliefs among our graduates will put our workers in disadvantage position. Interventions to improve students' SRL and motivational beliefs are essential to overcome such problems. However, stand-alone *Learning to Learn* courses were less effective as the students were unable to transfer the SRL skills to other subjects. In addition, motivation beliefs are not context

neutral. Any intervention to improve motivational beliefs need to be embedded into the course of study. Moreover, *Learning to Learn* courses are more costly to operate. Other interventions in the forms of tools may be used in higher education but when used in isolation, they may not produce significant improvements. This is because SRL and motivational beliefs are multi-facet and interventions need to cover these various aspects (Hashemyolia, et al, 2014). In addition, empirical evidence showed that tools used in isolation were less effective to improve students' motivation to use them. There was no feedback from the lecturers and the interaction among students in using the tools was lacking.

Although there was empirical research in Malaysia reporting interventions on self-regulated learning and motivational beliefs in primary and secondary education (e.g. Ng, 2010), research on interventions in higher education was not found. Internationally, experimental research was found on, broadly, two types of approaches to intervention. The first was stand-alone courses that aim to foster self-regulated learning and motivational beliefs. The other approach was integrated approach through the use of learning journals. The main setback of stand-alone course approach was its lack of transferability of its content in addition to its high operating costs. In contrast, the integrated approach through learning journals has the advantage of skills application and it is more economical to implement. However, surprisingly, these empirical research has shown that the use of learning journals can only improve certain components of self-regulated learning and motivational beliefs (Arsal, 2010; Guvenc, 2010; Ewijk, et al, 2015; Perels, et al, 2009; Schmitz & Perels, 2011; Schmitz & Wiese, 2006). There seem to be not consistent across these empirical researches. However, one thing that was common was the lack of feedback to the students who wrote the journals. When there was no timely feedback to the students concerning their SRL

usage, they will not be motivated to keep exercising their SRL skills (Ewijk, Fabriz & Buttner, 2015). Students, then, would not be able to reflect on their learning and outcome more effectively. Pintrich (1999) reviewed empirical research and concluded that students' use of SRL strategies were depending on their motivational beliefs. Regular and timely feedback from the lecturers will improve their motivational beliefs which, in turn, foster the use of SRL strategies (Yusuf, 2011).

In addition, it will be more engaging if the feedbacks are given through electronic form, such as asynchronous discussion board in the Learning Management System (LMS). Asynchronous discussion board has great potential to serve as a platform to promote active learning while sustaining motivational beliefs (Hashemyolia, et al, 2013). It is an avenue where students can interact with the lecturers based on the feedback from the learning journals. Butler and Winne (1995) reviewed different models of feedback and synthesized that feedback can improve knowledge construction and motivational beliefs. Nicol and Macfarlane-Dick (2006) conceptualised that feedback to the students can help students to improve their SRL.

The learning journal, as a tool in LMS, can also be used as a feedback to the lecturers on their teaching quality. Lecturers can understand and assess students' understanding in a course through journal writing (Tang, 2002). There are able to help lecturers for effective teaching planning and management. The interaction and feedback of students-lecturers through the use of e-learning journal on an electronic platform may create the dynamics necessary to improve students' self-regulated learning.

Interventions need to integrate with information technology in order to make it more inviting to the students (Ewick, *et al*, 2015). This is essential as we are in the technology edge and all the students in higher education are the Netizen generation.

At the moment, the integration of tools on the Learning Management Systems (LMS) for such purpose was not found, indicating under-utilization of such systems. The integration of e-Learning Journal together with asynchronous discussion board will provide the benefits of both tools (Hashemyolia, et al, 2013).

SRL involves the execution of multiple cognitive, metacognitive functions as well as motivations beliefs. Many interventional studies only deployed pre-test and post-test measures but the process of change was not measured. The lack of such insight hinders academics from deploying effective interventions to foster students' SRL.

This research aims to fill in the literature gaps by promoting and sustaining students' motivational beliefs and SRL at higher education through the utilization of Integrated Journal Discussion IJD (e-Learning Journal integrated with Asynchronous discussion board e-learning journal) in LMS.

1.4 Research Objective

In this study, there were four research objectives:

1. To test the effectiveness of Integrated Journal Discussion Board (IJDB) in improving university students':
 - (a) Motivational belief and its sub-dimensions;
 - (b) Self-regulated learning and its sub-dimensions.
2. To measure the changes in the level of motivational beliefs and SRL over the intervention period; and
3. To understand the users' (both students and lecturer) views on IJDB.

1.5 Research Questions

The research questions for this study were:

1. What are the effects of Integrated Journal Discussions Board on students' motivational beliefs and its sub-dimensions?
2. What are the effects of Integrated Journal Discussion Board on students' self-regulated learning and its sub-dimensions?
3. What are the changes in the level of motivational beliefs over the interventional period?
4. What are the changes in the level of SRL over the interventional period?
5. How do the students view the functions of Integrated Journal Discussion Board in their motivational beliefs and self-regulated learning?
6. How does the lecturer view the functions of Integrated Journal Discussion Board?

1.6 Hypotheses

Based on the above research questions, the following hypotheses were formulated. The significance level was set where $p \leq 0.05$.

Research Question No. 1:

H₀₁ There is no significant difference in motivational beliefs after the use of IJDB.

In order to examine the sub-dimensions of motivational beliefs, the following hypotheses were developed:

H_{01a} There is no significant difference in self-efficacy after the use of IJDB

Ho1b There is no significant difference in task value after the use of IJDB

Ho1c There is no significant difference in the control of learning belief after the use of IJDB

Ho1d There is no significant difference in intrinsic goal orientation after the use of IJDB

Ho1e There is no significant difference in extrinsic goal orientation after the use of IJDB

Research Question No. 2:

Ho2 There is no significant difference in self-regulated learning (SRL) after the use of IJDB

The following hypotheses were developed to examine the sub-dimensions of SRL:

Ho2a: There is no significant difference in metacognitive strategies after the use of IJDB.

Ho2b: There is no significant difference in critical thinking skills after the use of IJDB.

Ho2c: There is no significant difference in elaboration strategies after the use of IJDB

Ho2d: There is no significant difference in organisation strategies after the use of IJDB

Ho2e: There is no significant difference in rehearsal strategies after the use of IJDB.

Research Question No. 3:

H03: There is no significant difference in the mean of weekly self-efficacy scores over the intervention period

H04: There is no significant difference in the mean of weekly self-motivation scores over the intervention period

H05: There is no significant difference in the mean of weekly study plan scores over the intervention period

H06: There is no significant difference in the mean of 'perceived sufficient study time' scores over the intervention period

H07: There is no significant difference in the mean of 'perceived sufficient study effort' scores over the intervention period

H08: There is no significant difference in the mean of 'understanding of topics to-date' scores over the intervention period

H09: There is no significant difference in the mean of 'perceived usefulness of e-Learning Journal' scores over the intervention period

1.7 Significance of Research

This research would be beneficial to the stakeholders in the higher education at large. It would provide a tool for lecturers to be used in their instructional design. They can deploy IJDB to improve students' motivational beliefs and engage students in practicing self-regulated learning skills. It is a tool that can provide regular and iterative feedback to the lecturers on effectiveness of students' learning progress. This would be beneficial to enhance and sustain high quality of higher education. This is in

line with the teaching and learning practices in higher education. In addition, such tool could be used in many subjects and assessments can be build-in. This might ensure sustainability of the tools, especially when it is been used across many subjects in higher education. This would be a cost effective way of improving students' SRL and motivational beliefs.

This research would also be beneficial to the students in higher education, at large. They would be motivated to engage in using a tool that they could use to improve their SRL and their motivational beliefs. This would also create a new learning experience for the students in higher education. In addition, it has been empirically proven that students who mastered SRL can achieve better academic performance than those weak in SRL. Hence using this tool could also ensure graduates who possess SRL would enter the workplace. These graduates would be the competitive workforce when they are equipped with better SRL.

This research would be insightful for education psychology researchers as well. It integrated tools that are theoretically grounded. This would enable researchers to explore and develop more tools that are theoretically grounded to help students to improve their SRL and motivational beliefs. It would add to the empirical findings in the field of educational psychology, in general, and self-regulated learning and motivational beliefs research in Malaysia, in specific.

This research gave some insight on the design and use of a tool that was both an intervention as well as an assessment of SRL and motivational beliefs. This does not merely meet the contemporary research needs of SRL but invoke more research on creative use of various tools for these desired purposes (Panadero, Klug & Järvelä, 2015)

1.8 Definition of terms

The terms used in this research have its specific meaning. The key terms used and the definitions are listed here.

1.8.1 Self-Regulated Learning (SRL) Strategies

Self-regulated learning (SRL) refers to the multi-dimensional processes where the learners actively engaged in learning through the use of strategies in cognition and regulation of cognition (Pintrich, 1999; Zimmerman, 1989). The latter is also known as metacognition. Students engaged in SRL iteratively self-monitor and self-evaluate their learning through the use of these strategies.

In this research, SRL strategies refer to cognitive and metacognitive strategies that students deployed in their learning.

1.8.1(a) Cognitive strategies

Cognitive strategies refer to students' ability and skills to perform certain academic tasks. These tasks include recall, re-arrange or summarise the information. It includes re-organising and highlighting the main points in the notes taken during lecture.

In this research, the components of cognitive strategies were divided into Rehearsal, Elaboration and Organisation. Rehearsal refers to the strategies to recall the learning materials. This include repeat what has been taught aloud. Elaboration refers to the strategies to break down the learning materials into manageable chunks. This includes preparing mind maps on a topic. Organisation refers to the strategies to re-arrange the learning materials in a more meaningful way. This may include making notes on a topic to aid understanding.

1.8.1(b) Metacognitive strategies.

Metacognition refers to the awareness, monitoring and evaluating of cognitive strategies. It requires constant self-examination of the assumptions and premises of the information obtained.

In this research, metacognitive strategies include critical thinking strategies and metacognitive self-regulation. Critical thinking strategies are strategies that evaluate a subject matter with scepticism (Moon, 2008). This may include assessing the validity of assumptions and making inferences. These are essential tools in problem solving. Metacognitive self-regulation are the strategies that monitor the use of cognitive strategies to ensure the accomplishment of a task. These strategies may include evaluating and adjusting learning approach and self-reflection.

1.8.2 Motivational Beliefs

Motivational beliefs are extrinsic and intrinsic drives to learn (Bandura, 1986; Duncan & McKeachie, 2005; Pintrich, 1999). In this research, motivational beliefs include intrinsic goal orientation, extrinsic goal orientation, task value, control of learning belief and self-efficacy for learning and performance.

1.8.2(a) Intrinsic Goal Orientation

Goal is a representation of target that students may aim for. It may influence students' learning behaviour and preferences. Intrinsic goal orientation refers to students' motivational belief that is self-regenerated. It stems from students' own expectation on academic achievement.

In this research, intrinsic goal orientation refers to students' preference and self-generated motivation for engaging in an academic task.

1.8.2(b) Extrinsic Goal Orientation

Extrinsic goal orientation refers to students' aim of engaging in learning that comes from external environment. It affects the choice of task and the degree of engagement students involved.

In this research, extrinsic goal orientation refers to students' susceptibility to extrinsic motivation for engaging in an academic task.

1.8.2(c) Task Value

Task value refers to the belief of the usefulness and importance of a task to the student. It depends on the students' characteristics and interest in the task.

In this research, task value refers to students' perception on the contributions they may obtain from academic tasks. The perception includes its interest, importance and utility to the students (Pintrich, et al, 1991).

1.8.2(d) Control of Learning Beliefs

Control of learning beliefs refer to the belief that a student can achieve the learning outcome given the effort used in the learning. Such belief is affected by student's personal factors as well as contextual factors, such as the difficulty of the topic and the support that students are receiving from the lecturer.

In this research, control of learning beliefs measures the belief about possible expected outcomes from students' learning efforts.

1.8.2(e) Self-Efficacy for Learning and Performance

Self-efficacy for learning and performance refers to the belief of own capabilities in completing a task. Such belief is affected by one's past experience in

performing such task, personal factors well as situational factors such as feedback from expert.

In this research, self-efficacy for learning and performance are students' expectancy of success and self-efficacy in their academic performance. Students with high self-efficacy often have better academic performance.

1.8.3 Integrated Journal Discussion Board (IJDB)

Integrated Journal Discussion Board (IJDB) is a tool design based on Zimmerman's self-regulated learning theory and extensive review of literatures on technology-enhanced learning environment. The purpose of IJDB is to help students in improving their SRL and motivational beliefs in learning. Its uniqueness is that it can be used in any unit of study without much alteration and costs. Assessments can be build-in when using this tool. IJDB is situated in a technology-enhanced learning environment such as *Blackboard Learn* or *Moodle* hence making it engaging to students.

It consists of 4 stages in its operation and there are 2 major components. The first component is an e-Learning Journal. Students would need to answer 11 to 12 open-ended and multiple choice questions on a weekly basis. Their answers in the e-learning journals would be used by the lecturer to reflect on the teaching practices and identify the topics that students need help. The lecturer would formulate suitable questions for discussions based on these reflections. These questions would be placed on an asynchronous discussion board, which is the second component, where students and lecturer can interact and discuss. From these discussions, both the students could improve their understanding while the lecturer might have more insight about students'

learning. Students would be able to learn from each other as well through interactions with each other.

1.8.3(a) E-Learning Journal

E-Learning Journal is a written form of record, in electronic form, where the students reflect and write down their learning episodes. Some researchers used the term reflective diaries while others used learning diaries (Arsal, 2010; Guvenc, 2010; Ewijk, et al, 2015; Perels, Dignath & Schmitz, 2009; Schmitz & Perels, 2011; Schmitz & Wiese, 2006). Apart from the names and its format, there is no significant difference in its operational uses.

In this research, the e-Learning Journal is utilizing the *Survey* tool in *Blackboard*. It has questions scaffolding the students to reflect and write more effectively than the Learning Journal function on *Blackboard*.

1.8.3.(b) Asynchronous Discussion Board

Asynchronous Discussion Board (ADB) is an online discussion board where the lecturer posts questions or statements for every student to participate in the discussions. The students can read and answer or post their comments at their convenient times as long as the discussion thread is still available on *Blackboard Learn*. Therefore, the term ‘Asynchronous’ refers to such flexibility to participate in the discussions. They can also read the comments posted by other students and provide feedback to them as well.

1.9 Limitations of Study

This research was carried out over a single semester. Although the outcome, especially the qualitative data, revealed students’ tendency to use IJDB in their future

study and its usefulness, it did not further examine the sustainability of their motivational beliefs and SRL strategy use. Rotgans and Schmitz (2009) found that SRL strategy use was context neutral while motivational beliefs were not. Hence the sustainability of the effect from IJDB may depend on the contextual circumstances of the students' future units of study.

This research did not examine the effect on motivational beliefs and SRL strategy use from e-LJ and ADB separately. The effect was a composite one. It might not be useful if lecturer wants to determine the best combination of components on LMS for future research.

The number of participant in a research is a vital variable in order to generalise the outcome. However, the number of participants in this research was small hence the results did not poses statistical power for generalisation.

Lastly, as this research was not a true experimental research, no randomisation of its sample used. This might also limit its statistical power for generalisation.

1.10 Summary

This chapter discussed the background in higher education, including technology-enhanced learning environment, as well as the need for effective tools to improve students' self-regulated learning in higher education.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews and highlights the various research findings pertaining to technology-enhanced learning environment, self-regulated learning in general and in higher education context as well as the relevant interventions. It highlights the needs to provide feedback to the students on their learning journals and to sustain their motivation to write. The need to obtain feedback from teaching is also highlighted in order to foster students' self-regulated learning.

2.2 Related Theories

The concept of self-regulated learning was developed in the 1980s but it was not until the 1990s where Zimmerman (1989, 1990) made extensive research in its application in education. Zimmerman's model on SRL was grounded in Social Cognitive Theory (Bandura, 1986). However, this is one of the few theories on SRL. The other theories that are relevant to this research are Information Processing Theory and Sociocultural Theory. In addition, feedback is essential in learning and there are other SRL models integrating feedback as one of the SRL components. With the rapid development of educational technology, models have incorporated mapping of web-based pedagogical tools with the SRL processes.

2.2.1 Social Cognitive Theory

Social Cognitive Theory (SCT) was made popular by Bandura (1986). The tenets of SCT are triadic reciprocity of human behavior, human cognition and other personal factors with the environment (Bandura, 1986 and 1989). Bandura posited that these three are reciprocally interacting and influencing each other but with unequal

strength. Such reciprocity forms self-regulation in an educational context. The students will become the products and the producers of their environment and their social systems (Pajares, 2008). Using SCT, Zimmerman (1989) developed a three cyclical-phases model of self-regulated learning and motivational beliefs. The forethought phase is the initiation phase where students set themselves on their learning journey. They analyse and select suitable learning strategies. Motivational beliefs are of essence in this phase. The level of motivational beliefs will influence the selection of strategies and goals as well as the amount of effort they will put in in the later phase. The performance control phase is where the learning occurs. Regular self-monitoring is needed for students to be able to adjust their learning strategies. At the same time, students may regulate their motivation to keep on persevering even in the face of learning difficulties. Self-reflection phase is the post-learning phase where students reflect on their learning. Students need to re-examine their learning strategies and make necessary adjustments in order to accelerate learning achievement. Bandura (1986) posited that self-reflection helps to boost students' self-efficacy when they believe in their capability to perform better. These self-reflection processes will feed-forward to the forethought phase. In self-regulated learning, students need to obtain feedback from both their peers as well as their lecturer in order to reflect effectively and to improve further in their learning. These self-regulatory processes create a feedback loop of self-regulation. Bandura (1986) highlighted that informative feedback is vital as part of the self-regulatory mechanism. It will enable effective self-reflection.

Pintrich (1999) proposed a framework to relate students' motivation and SRL following his various studies in middle-school and higher education. He found that students' self-efficacy is positively correlated with their SRL strategies usage. Students

with high self-efficacy tend to exercise more SRL strategies in their study. In addition, Pintrich also discovered that task value is positively correlated with SRL strategies usage. Goal orientation is an important part of SRL and Pintrich found that mastery goals were strongly positively correlated to SRL strategies usage. So clearly these three types of motivation are essential to promote and sustain SRL throughout the three phases of SRL. However, Pintrich synthesized that promoting the use of SRL strategies need to be intentional as it will not be developed automatically. Students must monitor and sustain their motivation in order to use the various SRL strategies effectively. This synthesis highlighted the needs to have tools for students to monitor their learning and motivational beliefs in order to exercise their SRL strategies effectively.

2.2.2 Information Processing Theory

Winne and Hadwin (1998) presented a summary of the Information Processing (IP) view of SRL. Such view is modeling the main components of a computer, i.e. input, process, storage and output. The central of IP view is the concept of Control. The various components of IP models are to guide the processing of information toward the achievement of a pre-determined goal. One of the noted concepts of IP view is that the process of rehearsing is essential in connecting the new information acquired with the information stored in the long-term memory. The process of rehearsal can foster deeper understanding of knowledge in the performance control phase. Situated in today's information technology environment, the IP view is useful to relate the various components of SRL to the application of web-based tools available.

With the rapid development of technological tools for education, such as Learning Management Systems (LMS), lecturers can utilize these various tools to facilitate students' learning and interaction. These could occur in the performance control phase of SRL. Moreover, it can be utilized to gain feedback from students on

their learning and to provide timely feedback to them as well. Learning Management Systems (LMS) such as *Blackboard* offers various tools for these purposes. However, these tools are often being used in isolation (Nilson, 2013). They can be integrated in their usage based on valid theoretical framework in order to optimize its benefits both to the students and to the lecturer as well to enhance better SRL strategies usage as well as improving students' motivational beliefs.

The use of electronic journal, or e-Journal, can create a welcoming feeling for students to be more engaged in journal writing. It also creates novelty for students to learn. It would be more attractive than the traditional paper-based journal. In order to scaffold students' reflection and monitoring of their learning, the e-Journal should have a pre-determined format. The format must focus on the three phases of self-regulated learning model. The e-Journal will provide useful information and feedback of learning for the lecturer to formulate suitable questions on the online discussion board. This will ensure students' engagement on the online discussions as the questions will be addressing their learning needs. These interactions are coherent to the various theories on SRL.

Dabbagh and Kitsantas (2004) formulated a table, mapping the processes of self-regulation with the examples of web-based pedagogical tools (Table 2.2.). They assured that the tools on LMS can help to improve students' SRL and motivational beliefs if they are been used collaboratively.

Table 2.1

Mapping Web-Based Pedagogical Tools to Self-Regulatory Processes (adapted from Dabbagh & Kitsantas, 2004)

Processes of self-regulation	Examples of Instructor's role in supporting self-regulation	Associated web-based pedagogical tools category	Examples of students' use of a pedagogical tool
Goal setting	Help students to identify and set learning goals	Collaborative and communication tools	Students use e-mail to communicate goals to instructor and receive feedback
Use of task strategies	Help students to select appropriate learning strategies	Content creation and delivery tools	Students use concept mapping software to organize course content
	Help students to interact meaningfully with content materials	Web-based multimedia tools	Students use graphics, audio and video to view and process learning content.
Self-monitoring	Help students to monitor their progress	Collaborative and communication tools	Students use archived discussion forums to reflect on their learning and monitor their progress.
Self-evaluating	Help students to evaluate their work	Content creation and delivery tools	Students use rubrics, evaluation criteria, and peer feedback, posted online to evaluate their assignments.
Time planning and management	Help students to develop effective time planning and management skills	Collaborative and communication tools	Students follow posted protocols on how to participate in moderated online discussions to budget their time.
		Content creation and communication tools	Students use the online course calendar or timeline to plan semester activities
Help-seeking	Help students to identify social and non-social sources	Collaborative and communication tools Web-based hypermedia tools	Students use an electronic list serve to post a question. Students use a search engine to obtain information.

This opens the opportunity for lecturers to utilize the relevant tools collaboratively in order to help students achieve better self-regulation.