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وَتَشْرِيفَتِي إِسْلَامٌ أَنْبَارًا بِنَجْمِيَا مُلْمَعِيَا

RELATIONSHIP BETWEEN CRITICAL THINKING
DISPOSITIONS, TEACHING APPROACHES,
LEARNING APPROACHES AND CRITICAL
THINKING SKILLS: TESTING A CONCEPTUAL
MODEL

BY

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the degree of Doctor of Philosophy

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ABSTRACT

Preparing students to be able to think critically is a goal of many professionals in higher education. Therefore, critical thinking skill is considered an important variable in the process of students' learning. This study attempted to examine the predictive relationships of students' critical thinking dispositions, their perceptions towards teaching approaches and their learning approaches towards critical thinking skills. An instrument to measure critical thinking skills was constructed. Apart from that, three other instruments were used in gathering data, namely the adapted California Critical Thinking Dispositions Inventory (CCTDI), the students' perceptions of teachers' Approaches to Teaching and the Revised Study Process Questionnaire (R-SPQ-2F). Participants comprised of university students from International Islamic University Malaysia (IIUM), Universiti Kebangsaan Malaysia (UKM) and University of Malaya (UM). The data were analysed using statistical methods such as (alpha Cronbach), confirmatory factor analysis and structural equation modeling. Structural equation modeling was employed to test the interrelationship among all the variables simultaneously in one structural model. Nine hypotheses were tested using four structural models. Results showed that: (a) critical thinking dispositions were significantly related with critical thinking skills, (b) teaching approaches were not significantly related with critical thinking dispositions and skills, (c) surface learning approach was not significantly related with critical thinking skills, (d) critical thinking dispositions were not significantly related with learning approaches, (e) teaching approaches were significantly related with learning approaches, (f) surface approach did not significantly mediate the relationship between critical thinking dispositions and critical thinking skills, (g) surface approach did not significantly mediate the relationship between teaching approaches and critical thinking skills, (h) deep approach significantly mediated the relationship between critical thinking dispositions and critical thinking skills, (i) deep approach partially mediated the relationship between teaching approaches and critical thinking skills. Results showed that the full structural model of critical thinking skills has acceptable goodness-of-fit indices but did not explain well the contribution of predictors on critical thinking skills. Therefore, this model needed to be respecified. The respecified model was tested and results showed that this model has better goodness-of-fit. The results of the respecified model also reaffirmed the findings obtained in the hypotheses.

(confirmatory factor analysis)

(alpha Cronbach)

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APPROVAL PAGE

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Wan Shahrazad Wan Sulaiman

Signature.....

Date.....

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This study is dedicated in honour of my father, who provide wisdom and instill patience in me. I dedicate this study also in loving gratitude to my mother, who provide a persistent inspiration and motivation for my journey in life. Last but not least, this study is dedicated to my daughters, whom I am forever grateful for their unconditional love, patience and understanding.

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TABLE OF CONTENTS

Abstract	ii
Arabic Abstract	iii
Approval Page.....	iv
Declaration	v
Copyright Page.....	vi
Acknowledgements	vii
Contents	viii
List of Tables	ix
List of Figures	x
CHAPTER ONE: INTRODUCTION	1
Background of Study	1
Statement of the Problem	3
Research Objectives	7
Research Questions.....	8
Theoretical Justifications	10
Significance of Research	16
Conceptual and Operational Definitions	18
Chapter Summary	22
CHAPTER TWO: LITERATURE REVIEW	24
Introduction	24
The Concept of Critical Thinking Skills.....	24
Conceptualisation and Definition	24
Islamic Perspective of Critical Thinking	30
Research on Critical Thinking Skills.....	32
The Concept of Critical Thinking Dispositions.....	40
Conceptualisation and Definition	40
Research on Critical Thinking Dispositions	42
Predictors of Critical Thinking	49
Teacher Characteristics: Perceptions of Teaching Approaches.....	49
Learning Approaches.....	59
Relationship between Variables	65
Chapter Summary	68
CHAPTER THREE: THEORETICAL FRAMEWORK	70
Introduction	70
Model of Student Learning.....	71
Conceptual Framework.....	75
Presage Factors	79
Student Presage Factors	80
Teaching Context Presage Factors	83
Process Variable	86
Product Variable	94

Research Hypotheses	98
Chapter Summary	102
CHAPTER FOUR: METHOD	104
Introduction	104
Research Method	104
Participants	104
Instruments	106
Test Scoring	114
Procedures	116
Reliability and Validity of Instruments	118
Data Analysis.....	119
Structural Equation Modeling	119
Modeling Strategy	124
Chapter Summary	125
CHAPTER FIVE: RESULTS	127
Introduction	127
Descriptive Statistics	130
Demographic Variables	130
Confirmatory Factor Analysis (CFA).....	131
Normality Tests for CFA	131
Results of Confirmatory Factor Analyses (CFA).....	134
Testing of Hypotheses	144
Normality Tests for Structural Models.....	145
Model Specification for Hypothesized Structural Model 1.....	148
Results of Structural Model 1	149
Model Specification for Hypothesized Structural Model 2.....	153
Results of Structural Model 2	154
Model Specification for Hypothesized Structural Model 3.....	159
Results of Structural Model 3	160
Model Specification for Hypothesized Structural Model 4.....	165
Results of Structural Model 4.....	166
Summary of Hypotheses Tests	171
Full Structural Model of Critical Thinking.....	172
Respecified Model of Critical Thinking.....	180
Summary of Findings of the Study.....	189
Chapter Summary	191
CHAPTER SIX: DISCUSSION.....	193
Introduction	193
Hypotheses Testing.....	193
Results of Full Structural Model of Critical Thinking	219
Chapter Summary	234
CHAPTER SEVEN: CONCLUSION	236
Introduction	236
Overview of the Present Study	236
Implications	240

Limitations	243
Recommendations	245
BIBLIOGRAPHY	247
APPENDICES	266
Appendix A: The adapted California Critical Thinking Dispositions Inventory	
Appendix B: The adapted Approaches to Teaching Inventory	
Appendix C: The Revised Study Process Questionnaire	
Appendix D: The Malaysian Critical Thinking Test	

LIST OF TABLES

<u>Table</u>		
<u>Page</u>		
4.1	Percentage of Participants according to gender, year of study and university	105
4.2	Tests of critical thinking and its subscales	111
4.3	Items according to subscales	115
5.1	Percentage of participants according to gender, year of study and university	130
5.2	Assessment of normality for CCTDI	132
5.3	Assessment of normality for ATI	132
5.4	Assessment of normality for R-SPQ-2F	133
5.5	Assessment of normality for MCTT	134
5.6	Goodness-of-fit indices of the CCTDI measurement model	136
5.7	Goodness-of-fit indices of the ATI measurement model	138
5.8	Goodness-of-fit indices of the R-SPQ-2F measurement model	140
5.9	Goodness-of-fit indices of the MCTT measurement model	142
5.10	Goodness-of-fit indices of all measurement models	144
5.11	Assessment of normality for structural model 1	145
5.12	Assessment of normality for structural model 2	146
5.13	Assessment of normality for structural model 3	147
5.14	Assessment of normality for structural model 4	147
5.15	Goodness-of-fit indices of structural model 1 and standardized regression weights	152
5.16	Goodness-of-fit indices of structural model 1 and standardized regression weights	158

5.17	Goodness-of-fit indices of structural model 1 and standardized regression weights	163
5.18	Indirect effects of critical thinking dispositions, ITTF, CCSF, surface approach and critical thinking skills	164
5.19	Goodness-of-fit indices of structural model 1 and standardized regression weights	169
5.20	Indirect effects of critical thinking dispositions, ITTF, CCSF, deep approach and critical thinking skills	170
5.21	Goodness-of-fit indices of all structural models	172
5.22	Assessment of normality for structural model of critical thinking	174
5.23	Goodness-of-fit indices of full structural model and standardized regression weights	178
5.24	Indirect effects of critical thinking dispositions, ITTF, CCSF, surface and deep approaches and critical thinking skills	179
5.25	Goodness-of-fit indices of respecified model and standardized regression weights	184
5.26	Indirect effects of critical thinking dispositions, ITTF, CCSF, surface and deep approaches and critical thinking skills	185
5.27	Summary of results by hypotheses	189

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
3.1	Model for the Study of Classroom Teaching	73
3.2	The 3P Model for Teaching and Learning	74
3.3	A conceptual framework for examining the relationship of student and teacher variables of students' critical thinking skills	76
3.4	The hypothesized model of structural relations among critical thinking dispositions, teaching approaches, learning approaches and critical thinking skills	99
5.1	Measurement model of CCTDI	136
5.2	Measurement model of ATI	138
5.3	Measurement model of R-SPQ-2F	140
5.4	Measurement model of MCTT	142
5.5	Hypothesized structural model 1 on direct effects of dispositions, ITTF, CCSF, surface and deep on thinking	148
5.6	Results of structural model 1	151
5.7	Hypothesized structural model 2 on direct relationship of dispositions, ITTF, CCSF on surface and deep approaches	154
5.8	Results of structural model 2	157
5.9	Hypothesized structural model 3 on direct and indirect relationship of dispositions, ITTF, CCSF and surface approach on thinking	160
5.10	Results of structural model 3	162
5.11	Hypothesized structural model 4 on direct and indirect relationship of dispositions, ITTF, CCSF and deep approach on thinking	165
5.12	Results of structural model 4	167
5.13	Hypothesized structural model of critical thinking on direct and indirect relationship of dispositions, ITTF, CCSF, surface and deep approach on thinking skills	175

5.14	Results of full structural model of critical thinking	177
5.15	Results of the respecified model of critical thinking	182

CHAPTER ONE

INTRODUCTION

BACKGROUND OF THE STUDY

Human beings are sometimes presented with too much information that we can deal with. Thus we must find ways to select the information so that the cognitive process is not overburdened. Yet at times, we do not have all the information we need to make the right decisions and solve problems we are facing. The cognitive process in thinking helps human beings deal with situations when there is too much or too little information at hand.

The process of thinking involves a goal that has to be obtained, such as a completed word puzzle, a satisfactory house-budget or a well-planned trip. Effortful thinking is necessary when this goal is not immediately attainable and its solution is not obvious and only becomes effortless when we know what to do to attain the goal (Robertson, 1999). In other words, the ability to think well is closely related to how much knowledge individuals have. The more knowledge they have, the better they can think with that knowledge in solving problems and making decisions. Unfortunately, most of us try to avoid expending effort in thinking and prefer doing things without thinking, hence the inaccurate decisions, biases in judgment and errors in solving problems. The basic practical things we do in our lives will only become efficient and effective if good thinking precedes those activities.

Recent investigations in Western Europe and the United States of America show that the level of critical thinking skills among students in higher education is low (Guest, 2000; van Gelder, 2005). In the Malaysian context, the same scenario can be

seen. Rosnani and Suhailah (2003) state that after 11 years of schooling, students were unable to apply the content knowledge acquired in school to real-world problems. Reports from the business sector also indicate the low quality of graduates they receive from the universities who sometimes could not even comprehend the manual of an equipment, what more the way it works (Rosnani & Suhailah, 2003). Employers feel that schools have failed to produce students who are knowledgeable and well-equipped with thinking skills, which are very much demanded in most working sectors.

Many studies have begun to reveal symptoms of decline in students' ability to think well, especially in the system where schools focus on the mastery of subject content rather than the learning process of general domains. Gough (1991) agreed when she said that many educators believe specific knowledge will not be as important to tomorrow's workers and citizens as the ability to learn and make sense of new information. In a summary of an international research, Pithers and Soden (2000) found that college graduates are expected to learn not only the content and methods of a discipline but also to develop 'generic abilities'. These generic abilities include a heavy emphasis on critical thinking skills. Thus, teaching students to become effective thinkers has been recognised as an immediate goal of education.

The ability of students to think critically has become a major concern among educators and psychologists as they try to study the factors influencing the acquisition of thinking skills. Concurrently, over the last twenty years there has been an avalanche of literature on the nature of higher order thinking and how we learn it. This research therefore focuses on the role of interplay of factors, from the students' characteristics of the dispositions towards critical thinking, students' perceptions towards teachers in

terms of teaching approaches, to the learning approaches students employ in the process of learning.

STATEMENT OF THE PROBLEM

The ability to think critically is important among students in higher education as the content of education at this level requires higher order thinking such as the ability to apply critical evaluation, give evidence for their opinions, and argue the validity of facts they receive from teachers. However, Norris (1985) said that critical thinking ability is not prevalent among students. Most students do not obtain good scores in tests that measure the ability to identify assumptions, evaluate arguments and make inferences. Paul (1990) also agreed and said that resistance to using critical thinking is prevalent among many higher-education faculty.

One perspective of analysing the weakness of students' thinking ability is by looking at the students' learning process. In this research, students' learning process will be studied by using Biggs' (1993) theory of student learning. This theory states that students' learning outcomes are influenced by three factors: first, the student factors, that is the experiences students have prior to entering the educational process; second, the teacher factors, which refer to teacher characteristics such as teacher formative experiences, training experiences and teacher properties; and third, the process variables, referring to the actual activities taking place in the classroom. These theories will be discussed at length in Chapter 3.

Based on Biggs' (1993) theory of student learning, this research tries to investigate the product variable of critical thinking skills and what are the predictor variables that influence critical thinking skills. The justification of choosing the various predictor variables is based on Biggs' theory that outlines and describes what variables are suitable as presage variables and process variables. At the same time,

various studies related to critical thinking skills are analysed to see the trend of research documenting the relationship of these predictor variables on critical thinking skills. Based on these considerations, the relationships of predictor variables of critical thinking dispositions, teaching approaches and learning approaches on critical thinking skills are examined.

The education process that students are experiencing in Malaysia currently occurs in three levels, the primary, secondary and tertiary levels. However, the focus of education at the secondary level is centred on the acquisition of content rather than improving students' thinking (Rosnani & Suhailah, 2003). This is supported by a study done by Asmah (1994) on the analysis of students' performance in a standard national examination, the Higher School Certificate (STPM) in 1992. Students were unable to analyze, synthesize, evaluate and extrapolate ideas and they were also weak in giving ideas and making correct, logical and systematic explanations. This was partly due to the fact that most of the candidates practised on forecast questions and memorised answers for them (Asmah, 1994).

Although most people agree that developing thinking ability among students should be an important goal of the education system, theoreticians, researchers and practitioners were unable to arrive at an agreed upon definition of thinking, which makes the task of teaching it difficult. Various terms have been given to describe the different types of thinking involved such as reflective thinking, critical thinking, creative thinking, logical thinking, deductive thinking, inductive thinking, lateral thinking, analytical thinking, caring thinking and analogical thinking.

The discrepancies in defining what critical thinking skills are led to the differences in assessing the construct. Obviously, an assessment of students' critical thinking skills is necessary to monitor its development. Unfortunately, assessment and

evaluation of critical thinking has been sorely neglected worldwide (Kennedy, Fisher & Ennis, 1991). For this purpose, instruments have been available in the West such as the Watson-Glaser Critical Thinking Appraisal (W-GCTA; Watson & Glaser, 1994) and the California Critical Thinking Skills Test (CCTST; Facione, Facione, Blohm, Howard & Giancarlo, 1998). However, the differences in the conceptualisation of critical thinking may lead to different interpretations of critical thinking abilities, what one considers as low level of critical thinking skills may not be agreed upon by another person. The instruments developed also originated from the West, requiring modification and adaptation when applied to countries where English is not the primary language and whose cultures, including values and lifestyles are different from that of the West.

At this point of time, it is useful to ask what are the characteristics that students should have to encourage the acquisition of critical thinking skills. A good thinker possesses certain abilities: cognitive abilities, as well as thinking strategies and skills. Yet what sets good thinkers apart is not simply superior cognitive ability or particular skills; rather it is their tendencies to explore, to inquire, to seek clarity, to take intellectual risks, to think critically and imaginatively. These tendencies can be called “thinking dispositions” (Tishman, Jay & Perkins, 1992).

Baron (1987), Ennis (1987) and Tishman et. al. (1992) stressed the importance of dispositions and made the strong claim that being a good thinker means having the right thinking dispositions.

A great deal of research currently being reported indicates that the direct teaching of critical skills can produce better, more critical thinkers. Nearly all of the thinking skills programmes and practices investigated were found to make a positive difference in the achievement levels of participating students. Thinking skills

instruction accelerated the learning gains of participants (Ristow, 1988; Robinson, 1987). It is possible that many factors will determine the success of the teaching of thinking in the classroom, but undeniably, the teacher factor seems to be the most responsible. One characteristic of the teachers' role is the method of teaching used. The conventional method of transmitting knowledge involves the rigid version of students sitting quietly and receiving information they need. In such an environment, an inclination to be passive with respect to knowledge tends to develop. Students do not become disposed to seek and evaluate information on their own; rather they learn to count on the environment to automatically feed them information (Tishman et. al., 1992). A favourable teacher behaviour therefore should be able to cultivate good thinking dispositions and skills. Rather than requiring them to passively take in information, teacher interacting with students will encourage them to ask questions, probe assumptions, and seek justifications.

The qualitatively different approaches to teaching have been found to relate to students' qualitatively different approaches to learning (Trigwell, Prosser & Waterhouse, 1999) and in many studies these learning approaches have been found to relate to the quality of the outcome of student learning. Therefore, another student characteristic related with critical thinking skills in learning situations is learning approach. Two levels of processing have been identified; surface approach, where the focus of the learning is on the text itself (the sign) and deep approach where the student concentrates on the internal content of the learning material (what is signified). Surface approach refers to the students' intention to complete task requirement, rote learning, memorising information needed for assessments and accepting teachers' opinion without thinking while deep approach learners adopt

active questioning in learning, make effort to understand new material, relate ideas to previous knowledge and relate concepts to everyday experience.

This research is therefore aimed at investigating the interplay of the roles of student characteristics, students' perceptions towards teachers and the learning approaches students employ that contribute to students' critical thinking skills. Structural equation modeling will be used to test the model hypothesizing the influence of critical thinking dispositions, teaching approaches on students' learning approaches and critical thinking skills. Predictor variables are critical thinking dispositions, teachers' teaching approaches and learning approaches while critical thinking skills are the criterion variable.

The research hypotheses will be tested using structural equation modeling (SEM). SEM is a technique used to test hypothesized relationships among variables by estimating a series of separate, yet interdependent multiple regressions simultaneously using a maximum likelihood fitting function to develop structural equations by using both observed and latent variables (Hair, Black, Babin, Anderson & Tatham, 2006). The model in this study is developed from relationships established in previous theoretical and empirical research and it incorporates previously validated measurement scales.

RESEARCH OBJECTIVES

This research aims at:

1. Examining the relationship between students' critical thinking dispositions and critical thinking skills.
2. Examining the relationship between students' perceptions of teachers' teaching approaches and critical thinking skills.

3. Examining the relationship between students' learning approaches and critical thinking skills.
4. Examining the relationship between critical thinking dispositions and learning approaches.
5. Examining the relationship between students' perceptions of teachers' teaching approaches and learning approaches.
6. Exploring the role of learning approaches as mediating variables in the relationship between critical thinking dispositions and critical thinking skills.
7. Exploring the role of learning approaches as mediating variables in the relationship between teachers' teaching approaches and critical thinking skills.
8. Exploring the relationships of all variables simultaneously in one full structural model.
9. Validating the instruments measuring critical thinking dispositions, teachers' teaching approaches, learning approaches and critical thinking skills.

RESEARCH QUESTIONS

Research in critical thinking shows that there are many factors that can influence students' acquisition of critical thinking skills. Among the factors are the learning and teaching variables which include students' critical thinking dispositions, students' perceptions of teachers' teaching approaches and their approaches to learning. This study will look at various questions arising due to the interplay of these factors so that