

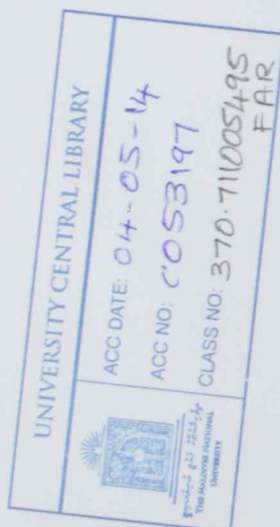
PRE-SERVICE TEACHERS' SELF-EFFICACY
TOWARDS TEACHING THINKING SKILLS AND
THEIR CRITICAL THINKING DISPOSITION:
A CASE STUDY IN THE MALDIVIAN NATIONAL
UNIVERSITY, MALDIVES

BY

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A dissertation submitted in fulfilment of the requirement
for the degree of Master of Education

Institute of Education
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ABSTRACT

This study examined pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition. This is a quantitative study conducted in Maldivian National University involving seventy four pre-service teachers. The respondent comprised of 56 female and 18 male pre-service teachers. The self-efficacy towards teaching thinking skills were measured using a questionnaire which was devised by Tebbs (2000) and their critical thinking disposition were measured using a questionnaire which was devised by Irani, Rudd, Gallo, Ricketts, Friedel, & Rhoades (2007). In addition, associated demographic data were obtained included gender, age, GPA and the type of teacher education program of the pre-service teachers of Maldivian National University. The questionnaire which measured self-efficacy towards teaching thinking skills consisted of four subscales; Creating a Classroom Fit to Think, Teaching Higher Order Thinking Skills, Teaching for Transfer and Recognise How Students Think. The questionnaire which measured critical thinking disposition consisted of three subscales; Engagement, Maturity and Innovativeness. The findings of this study revealed that the pre-service teachers had an average level of self-efficacy towards teaching thinking skills and a high level of critical thinking disposition. The pre-service teachers had the lowest self-efficacy in Recognizing How Students Think and most confident in Creating a Classroom Fit to Think. In all of the domains in critical thinking disposition the pre-service teachers at MNU had a high level of critical thinking disposition. Furthermore, study also showed that there was no difference in gender, age or GPA in the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition. While there was no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and the program the pre-service teachers were enrolled in, there was a significant difference in the pre-service teachers' critical thinking disposition and the type program the pre-service teachers were enrolled in. There was no significant relationship between the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with any of the demographic variables. A positive correlation between the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition was found.



خلاصة البحث

تقوم هذه الدراسة بفحص كفاءة المعلمين قبل الالتحاق بالجامعة، حول مهارات التفكير التعليمي، وسلوك التفكير النقدي. عينات هذه الدراسة تتكون من ٥٦ معلمة و ١٨ معلماً بجامعة مالديف الوطنية، ويتم قياس كفاءة المعلمين قبل الالتحاق بالجامعة حول مهارات التفكير التعليمي باستخدام الاستبانة التي وضعها العالم ويب (٢٠٠٠م)، وقد تم قياس سلوك التفكير النقدي لديهم عبر استبانة التي وُضعت من قبل العلماء: إيراني، وورود، وجالو، وريكيتس، وفريدل، وروداس (٢٠٠٧م). وفضلاً عن هذا فقد تم الحصول على المعلومات الديموغرافية التي تتضمن الجنس والعمر ومعدل المتوسط الدراسي، ونوعية برنامج التعليم للمعلم الذي لم يلتحق بالتعليم في جامعة مالديف الوطنية. تنقسم هذه الاستبانة إلى أربعة محاور فرعية وهي: إيجاد الفصل الدراسي المؤهل لتعليم التفكير، ومهارات تعليم التفكير العالي، والتعليم من أجل التحاق الطالب بالجامعة، وكيفية تفكير الدارسين، وتتكون الاستبانة الثانية من ثلاثة محاور فرعية، وهي: العمل والنضج والابتكار. من أهم نتائج الدراسة أنها تكشف أن المعلمين غير الملتحقين بالجامعة يملكون مستوى متوسط من الكفاءة الذاتية حول مهارات التفكير التعليمي، ومستوى عال من سلوك التفكير النقدي؛ وأن هناك من المعلمين الذين لم يلتحقوا بالجامعة من هم في مستوى متدنٍ في الكفاءة الذاتية، وفي التحقق من كيفية تفكير الدارسين وفي ثقتهم بإيجاد فصل دراسي يؤهلهم بالتفكير. أما في إطار سلوك التفكير النقدي فلدى المعلمين في جامعة مالديف الوطنية مستوى عال من القيام بالتفكير النقدي. وفضلاً عن ذلك وجدت الدراسة أنه ليس ثمة اختلاف في الجنس والعمر لدى المعلمين وكفاءتهم الذاتية، حول القيام بالتفكير النقدي ومهارات التفكير التعليمي، وبين البرنامج الذي انخرطوا فيه، ووجدت أيضاً أنه ليس هناك علاقة ذات أهمية بين الكفاءة الذاتية للمعلمين حول مهارات التفكير التعليمي، وسلوك التفكير النقدي في أي من التنوعات الديموغرافية، وأخيراً وجدت الدراسة أن هناك ارتباط إيجابي بين الكفاءة الذاتية للمعلمين حول مهارات التفكير التعليمي، وبين القيام بالتفكير النقدي لديهم.

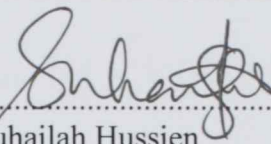
APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Education in Curriculum and Instruction.



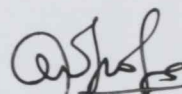
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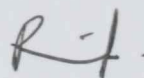
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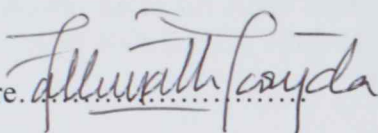
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DECLARATION

I hereby declare that this dissertation is the results of my own investigation, except where otherwise stated. I also declare that this dissertation has not been previously or concurrently submitted as a whole for any other degree at IIUM or at any other institution.

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Signature.



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This dissertation is dedicated to:

My mother, Hafeeza & my husband, Ziyad, this work could never have been completed without your inspiration, support and encouragement.

My amazing son, Khairullah who have patiently waited while mommy worked.

Love you all.

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All praise and thanks are to Allah *Sub'hanahu wa Ta'ala* for bestowing me His abundant blessings, mercy, help and guidance in completing this work. May His blessings, peace and favours descend in perpetuity on our beloved Prophet Muhammad *al-Mustafa, Sallallahu 'alaihi wa Sallam* who is the best ever critical thinker and the role model for the mankind.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The Republic of Maldives (see Figure 1.1), is a very small country whose native language, Dhivehi, is spoken only by its small population of about 324,992 (Statistical year book, 2010). Maldives gained its independence on 26th July 1965. A quarter of this population resides in Male', the capital of Maldives. Linguistic, historical and archaeological evidence suggests that Maldives have been inhabited at least for 2500 years (Ministry of Tourism, 2009). It is an island nation made up of approximately 1,190 low-lying coral islands situated in the Indian Ocean towards the north south off India's Lakshadweep islands, between Minicoy Island and Chagos Archipelago. The islands are low-lying and small, with an average size of 1 square kilometre, and none exceeding an elevation of 1 metre above sea level. These coral islands are stretched over an area of 820 kilometres north to south and 120 kilometres east to west (Maldives Monetary Authority, 2011). Though these islands of Maldives encompass an area of roughly 90,000 square kilometres it only has a total land area of 298 square kilometres. The capital of Maldives, Male' only has a land area of 2.5 square kilometres. These dispersed islands are naturally grouped into 26 atolls that are protected by surrounding coral reefs. However, for administrative purposes these atolls have been divided into 7 provinces. The Maldivians are uniquely homogenous, sharing the same language (Dhivehi, of Indo-Aryan descent, is unique to the Maldives), religion (Islam) and culture (Ministry of Tourism, 2009).

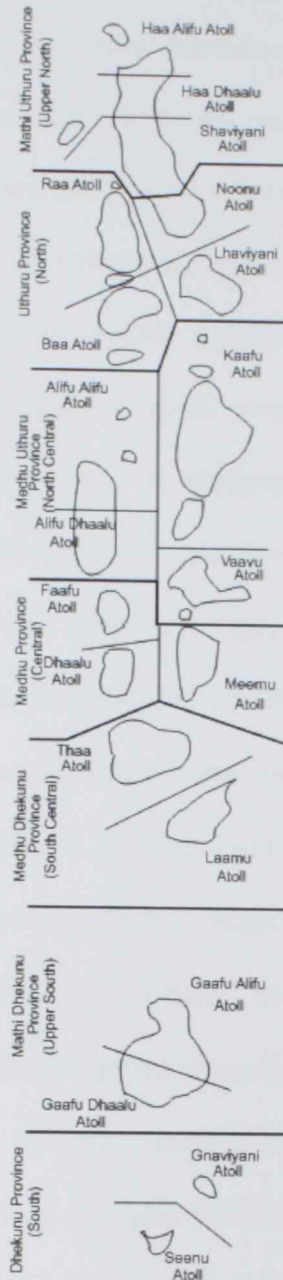


Figure 1.1: Republic of Maldives

The education system in Maldives has undergone many changes during the past decades. In 2007, the overall literacy rate is 98.8% (Education for all, 2008) is indicative of the fact that Maldivians attach great importance to education. Today, nearly one-third of the country's population is in school, with over 90,000 students

studying at different levels of schooling (Statistical year book, 2010). As such Maldivians throughout history have provided education to its people in varying degrees, and at different levels. Modern formal English medium schools system which follows the British system of education is established throughout Maldives operated both by the government, community and private sectors. An alternative to the national English medium education is offered by Arabic medium education. Madhrasathul Arabiyyathul Islaamiyya offers preparatory level classes and the Kulliyathul Dhiraasaathil Islaamiyya offers secondary as well as higher secondary level classes in Arabic language. The system of education in Maldives provides four levels of schooling namely pre-primary, primary, secondary, upper secondary education and special classes for children with special needs (Education for all. 2008).

The Maldives College of Higher Education, established in 1998, which became the Maldivian National University (MNU) in April 2011, is the only public tertiary institution in the country. The University offers a range of degrees, diplomas, and certificates, with particular emphasis on engineering, health science, management, tourism, and education. A Large numbers of primary teachers are trained locally and it was only in 2003 that local teacher education courses aimed at training secondary teachers were initiated (Maldives College of Higher Education, 2001).

The National Curriculum which was introduced in 1984 covers the primary curriculum in all subject areas. The secondary and upper secondary curriculum content is designed around the O-level and A-level examinations for the subjects except for Fisheries science, Dhivehi and Islamic studies. The curricula for these three secondary subjects are designed locally (Abdul Muhsin & Maryam Azra, 1998).

At present Maldives is in the process of reforming the curriculum from pre-school to grade 12. The draft of this National Curriculum which is displayed for the

general public to comment specifies eight key competencies which are essential for individuals to live, learn and contribute as active members of our nation and the world. These essential key competencies are: practising Islam, understanding and managing self, thinking critically and creatively, relating to people, making meaning, living a healthy life, learning for sustainable development and using technology and media (National Curriculum reform, 2011). Though it was never emphasised on critical thinking prior to this reform process in the education of Maldives, having the Cambridge curriculum for the secondary students would have somehow incorporated the teaching of thinking skills. That is in order for the students to answer the challenging questions in Cambridge paper require one to be a skilful thinker. Thus it can be assumed that the teaching of thinking must have been infused in the day to day teaching even though it has not been explicitly stated in the previous curriculum of the Maldives. Therefore it can be said that the Critical thinking ability plays a vital role in academic instruction, as well as in occupations (Daly, 1998) that require careful analytical thinking to perform essential job functions.

Being a Muslim country, the necessity of having Islamic principles is also identified in the National Curriculum framework. Though it is there it must be kept in mind that just including Islam as a principle in the National Curriculum framework would not be sufficient alone. It must be implemented in such a way that Islam is not compartmentalised to a specific subject area alone without any contemplation. This is because from an Islamic perspective, purpose of education is to cultivate a good man (*insane al-salih*) (Rosnani & Suhailah, 2003) not just a human being trained in a specific subject area. A good man is not necessarily a complete person who knows everything because there is no end to the vast knowledge. A good man is one who “enjoins what is right and forbids what is wrong and believe in Allah” (Qur’an, *Al-*

Imraan: 110). In order for the human being to be able to do this he must be one who loves peace, harmony and be just in his/her day to day tasks. For a person to understand, realise and practice these one must be endowed with enough knowledge, skills and dispositions towards them. Thus, the education must cultivate people with wisdom. Hence cultivation of a thinking human being is of vast necessity since it is this thinking that distinguishes a human being from other creatures (Rosnani & Suhailah, 2003)

For one, to be educationally and professionally successful the development of one's critical thinking skills and nurturing one's consistent internal motivation to use those skills is important. (Facione, Facione, & Giancarlo, 1997). This means the students need to be disposed towards critical thinking. One powerful tool for nurturing the disposition toward critical thinking in students is by modelling it. Thus the teachers who teach the students themselves need to have the critical thinking skills and to practice these skills they must have high self-efficacy towards teaching thinking and be disposed towards it. Perhaps it is assumed that, by the nature of professional training, pre-service teachers would implicitly have critical thinking skills and dispositions and that they naturally would employ critical thinking skills and dispositions in teaching and evaluating students. But so far no research has been carried out on pre-service teachers in this field in Maldives.

1.2 STATEMENT OF PROBLEM

Many of us agree that teaching and learning should enable students to effectively handle practical content and intellectual challenges in and outside classroom. We need high intellectual standards in our students, which includes all the components of education aligned to those standards.

Improving the quality of student thinking is an explicit priority of current educational reform efforts in Maldives. In the present days, educationalists are faced with rapid growth of complex information and knowledge, and the amount of information needed by students to function in today's society is overwhelming. The fast growth of this "*knowledge explosion*" could put some individuals at risk of losing their jobs or not getting one unless they continually learn and update themselves. Thus, the students should be equipped with ability to process increasing amount of these complex information and knowledge in a purposive and efficient way. Which means it would be wise to invest in the education of the future work force rather than suffer the financial loses and endure the financial and social burdens associated with economic weakness, public health problems, crime, and avoidable poverty. We need to teach students to make good decisions and this would equip them to improve their own futures and contribute to the society rather than be burdens on the society. Thus, the students need to be adaptable to change and be equipped with critical thinking and creative abilities to face the challenges that come by. Such abilities include wide range of cognitive skills and intellectual dispositions towards thinking skills.

The idea that teacher education should develop teachers' abilities to teach competently isn't debatable. It is also generally agreed that in order to do this, a teacher's education should include the development of the teacher's knowledge of teaching and of subject content, and work to sharpen their teaching skills. The knowledge is expanding at a very fast space, there is easy access to vast amount of information and the different aspects of knowledge would mean that teachers need to be in a position to analyse the information critically so that there would be no misinterpretations which could be passed over to their students. As such the teacher education should address these not only to include the critical thinking skills but also

to make these teachers improve their self-efficacy towards teaching thinking skills and disposed towards practicing those skills. If the teachers have low self-efficacy towards teaching thinking and are not disposed towards critical thinking would mean it is unlikely that they would practice critical thinking in classroom settings. Thus, the students would be at a disadvantage to learn or acquire not only the critical thinking skills but develop the disposition towards critical thinking.

Since, it is the teachers who are the mediators of knowledge as well as skills in the present day education and in the social settings, the importance of studying their self-efficacy towards teaching thinking skills and critical thinking dispositions would be of help in two ways. Firstly to modify or improve the teacher education programs to address such issues and secondly in the improvement of the school curriculum because these very pre-service teachers would have studied in one of the Maldivian school previously.

Last but not least the most important fact is that critical thinking is an essential activity required for recognizing Allah (SWA) through His creations and reflect upon the teaching of Qur'an and Sunnah. Today our society in Maldives is in a 'deep hole', that is to say that the generation of today has departed in some ways from not only following the Islamic principles but also moral values. This could be due to the fact the students are not accustomed to think critically of the consequences of their action. This means it is of vast importance to develop critical thinking dispositions in our students so that they would use it for their life time.

While the goal of educational reform in Maldives is to increase the number of skilled and knowledgeable professionals in the field of education capable of thinking and reasoning critically in stressful situations, not enough data to support the success of those changes have been collected. Though there are not enough researches carried

out in Maldives in this area of education several incidents that have occurred and is occurring in Maldives shows the minimal use of critical thinking skills. Thus this research tried to find the pre-service teachers self-efficacy towards teaching thinking skills and their critical thinking dispositions since this very teachers would be future teachers of Maldives.

1.3 THE PURPOSE OF THE STUDY

The underlying principle for this study is that in order for pre-service teachers to be ready for the great responsibility of teaching thinking skills in a classroom, they need adequate preparation. They should be trained in thinking skills before expected to teach the same. One indication of such preparedness should be that the pre-service teachers show high self-efficacy towards teaching thinking skills and are disposed towards such thinking skills. Thus the purpose of this current quantitative, correlational research study is to measure the self-efficacy towards teaching thinking and critical thinking disposition of final year pre-service teachers at MNU.

1.4 RESEARCH QUESTIONS

The research questions of this study revolve round the self-efficacy, critical thinking disposition and the demographic issues of final year undergraduate pre-service teachers at MNU. Based on the statement of the problem and the purpose of this study, this study aims to answer the following research questions.

1. What are the MNU pre-service teachers' level of self-efficacy with respect to the teaching of thinking skills?
2. What are the MNU pre-service teachers' profiles of critical thinking disposition?

3. Is there any significant difference in the self-efficacy towards teaching thinking skills among pre-service teachers in terms of their GPA, age, gender and the teacher education program?
4. Is there a significant relationship between the self-efficacy towards teaching thinking skills of pre-service teachers and the GPA, age, gender and the teacher education program?
5. Is there any significant difference in the critical thinking disposition among pre-service teachers in terms of their GPA, age, gender and the teacher education program?
6. Is there a significant relationship between the critical thinking dispositions of pre-service teachers and the GPA, age, gender and the teacher education program?
7. Is there any relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among pre-service teachers?

1.5 RESEARCH HYPOTHESES

This study will examine the following hypotheses:

- H₀1: There are no significant differences in levels of self-efficacy towards teaching thinking skills among pre-service teachers in terms of their GPA, age, gender and the teacher education program.
- H₀2: There are no significant relationships between the self-efficacy towards teaching thinking skills of pre-service teachers and the GPA, age, gender and the teacher education program?

- H₀₃: There are no significant differences in the critical thinking disposition among pre-service teachers in terms of their GPA, age, gender and the teacher education program.
- H₀₄: There are no significant relationships between the critical thinking disposition of pre-service teachers and the GPA, age, gender and the teacher education program?
- H₀₅: There is no relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among pre-service teachers.

1.6 SIGNIFICANCE OF THE STUDY

At a time of educational reform in Maldives it would be of vast importance to the curriculum development of Maldives to have studies in the fields of education in Maldives. The deficiencies and strengths in the education system may be highlighted by well designed research. Ideally the result of a research can lead to changes in method(s) or practice(s) to improve the present status. Thus this research is conducted in order to contribute to the need in the field of education.

The empirical evidence generated by this study will be significant for three main purposes. Firstly, findings of this study will persuade Maldivian government and the policy makers to review their stands in developing thinking skills among students and formulate policies to strengthen the training of in-service and pre-service teachers. The results of this study may assist the MNU in evaluating whether or not they are promoting, fostering, or nurturing students' development of critical thinking disposition throughout the teacher education programs. According to Facione, Facione, and Giancarlo (2000) critical thinking disposition is an attitudinal base for the internal

motivation towards thinking critically it could be said that it is a pre-requisite for any course. As such critical thinking disposition is important in any level of education or any profession which would need critical thinking. As such studying the dispositions of pre-service teachers is necessary to modify or improve the teacher education program to address such issues. By investigating the self-efficacy towards teaching thinking skills and critical thinking disposition in relation to various teacher education programs offered in the MNU, may enable them to identify the most need area to be modified thus would give a clearer picture of what is going on. Thus the study focuses on assessing what exists.

Secondly, these results and data could be used by the pre-service teachers themselves to improve their self-efficacy and critical thinking dispositions. It would be important to the pre-service teachers since they would be teaching at a school after graduating from the course. Thus, their self-efficacy and the disposition towards critical thinking could have a profound impact on the students' education since as asserted by Brookfield (1995) ones' critical thinking can facilitate reasoning and understanding of past, present, and future events. Teaching and developing critical thinking in education becomes an important aspect of teacher education.

Thirdly, as employers the school management could use the findings of this study to further monitor and maintain or improve the present and future teachers' self-efficacy levels and their critical thinking dispositions by conducting further studies and teacher development programs.

1.7 LIMITATIONS AND DELIMITATION OF THIS STUDY

Limitations are potential weaknesses or problems in a study (Creswell, 2005) outside the control of the researcher. Delimitations are weaknesses or problems within the

control of the researcher that might limit the external validity or generalizability of study results (Godzyk, 2008). There are several limitations and delimitations of this study.

One limitation of this study is, that the critical thinking dispositions of pre-service teachers may be affected by variables other than those identified for this study. A second limitation is the accuracy of the self-reported characteristics of pre-service teachers. Instructions are clearly written, yet some pre-service teachers may make errors in the reporting of their characteristics. A third limitation of the current study included the innate fallibility of survey instruments. Any instrument has limitations, subject to an intimidating array of biases and distortions. Respondents may answer at random, or may misunderstand items, or deliberately lie, or agree indiscriminately to any assertion presented to them. Which means with any self-reporting attitudinal or perception instrument, it can be difficult to know whether students actually feel, believe or do the things they report. Therefore, researchers using self-report instruments can only report on what students say, rather than on what the actual situation is.

One delimitation of this study is that the focus is on the self-efficacy towards teaching thinking skills and dispositions or inclinations of critical thinking demonstrated by pre-service teachers. Critical thinking skills per se are not evaluated in this study. A second delimitation is that the sample is drawn from a population of pre-service teachers in a variety of teacher education programs at MNU only. The results of this study will be exploratory and descriptive of pre-service teachers at this single institution. As such, it is not known if the results can be generalizable to other populations of pre-service teachers at other institutions.



1.8 DEFINITIONS OF KEY TERMS

This study employs the following definitions

Critical Thinking: Critical thinking is a well-developed, powerful way of thinking skill, which is central to learning because learning is a process where an individual modifies or strengthens worldviews, beliefs, opinion, attitudes, behaviours, skills, understanding and knowledge. Thus critical thinking in this study refers to abilities in the areas of interpretation, analysis, evaluation, inference, explanation, and metacognition (American Philosophical Association, 1990).

Critical thinking disposition: Since the tool used to measure the critical thinking disposition in this study is taken from Ricketts (2003), the Critical thinking disposition is defined in this study as "*the pre-disposed attitude one innately possess regarding critical thinking*" (Ricketts, 2003, p. 9). It measures three dimensions namely Engagement, Maturity and Innovativeness. The Engagement disposition measures students' predisposition to look for opportunities to use reasoning; anticipate situations that require reasoning; and confidence in reasoning ability. The Cognitive Maturity (Maturity) disposition measures students' predisposition to being aware of the complexity of real problems; being open to other points of view; and being aware of their own and others biases and predispositions. The Innovativeness disposition measures students' predisposition to be intellectually curious and wanting to know the truth (Ricketts, 2003).

Pre-service teachers: The final year final semester first degree level students in various teacher education programs at MNU seeking training in the field of teaching in order to prepare for work as teachers.

Self-efficacy towards teaching thinking skills: Bandura defines self-efficacy as “the belief in one’s capabilities to organise, and execute the courses of action required to manage prospective situations.” (Bandura, 1995, p. 2). Similar to Bandura, Pajares (2002) defines self-efficacy as an individuals' judgments on his/her abilities to achieve the designed performance levels. While Jain and Dowson (2009) define it as a level of an individual's self confidence in performing the task. Similar to Bandura and Pajares, Tierney and Farmer (2002) believes that self-efficacy is an individual's belief in his/her ability to create some innovative consequences. Thus in short it is belief in one’s capability to carry out a certain task. In light of these statements self-efficacy towards teaching thinking skills is defined in this study as one’s belief in his/her capabilities to teach thinking skills.

Teacher education programs: The first degree courses offered in the faculty of education of MNU in Maldives for the purpose of training pre-service teachers.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a review of relevant literature related to the research topic for this study. The aim of this chapter is to shed some light on the importance of critical thinking, teaching of thinking skills, Islamic perspective on thinking, critical thinking and critical thinking disposition, self-efficacy and present a focused review of relevant research as it relates to critical thinking disposition, self-efficacy and the variables of interest in this study.

2.2 IMPORTANCE OF TEACHING THINKING SKILLS

Many of us would agree that the main purpose of educating our children is to make them a good person. If so the aims of education has to be balanced in all aspects, that is physically, morally, intellectually and spiritually (Rosnani, 1996). From an Islamic perspective the goal of education must be to inculcate thinking skills in our students so that s/he can be a vicegerent of Allah who governs and utilises everything in this world for his/her well-being and live a harmonious life according to the Allah's commandment (Rosnani & Suhailah, 2003). This also in line with the view of the philosophy of Education as presented in the 1977 First World Muslims' conference on Education:

“Education should aim at the balanced growth of the total personality of Man through the training of Man's spirit, intellect, rational self, feelings and bodily senses. The training imparted to a Muslim must be such that faith is infused into the whole of his personality and creates in him an emotional attachment to Islam and enables him to follow the Qur'an and the Sunnah and be governed by the Islamic system of values willingly

and joyfully so that he may proceed to the realization of his status as *Khalifatullah* (vicegerent) to whom Allah has promised the authority of the universe” (Al-Attas, 1979, p. 158-159).

In this era, our society faces many challenges like education and health care for all the citizens, development and conservation of energy resources, expansion of job opportunities and long-term national security. Even to cope with any one issue it requires substantial level of critical thinking let alone to cope with all the challenges at once since critical thinking helps one to step back, examine ones thought processes and make them more effective by asking the right questions, challenging assumptions and seeing others' viewpoints with clarity. Rosnani & Suhailah (2003) and Syaidatun (2004) also believes social problems may also decrease when our youth become proficient in good thinking skills. Thus critical thinking would be an important tool in solving community problems.

If one of the aim of schooling is to prepare children to be lifelong learners, then it is important to help students become aware of themselves as learners and to take control of their own activities. According to Lipman (2003) a classroom is a type of community of inquiry, which leads one to question, reason, connect, deliberately challenge and develop problem solving techniques. The more children learn about general strategies for learning in specific contexts, the better they become at using them across domains. As John Bransford and colleagues observe, “The broader the range of strategies that children know and can appreciate where they apply, the more precisely they can shape their approaches to the demands of a particular circumstance” (Bransford, Brown, & Cocking, 2000, p. 100).

In today's knowledge economy, the rate at which the information is expanding makes it impossible for the students to acquire and 'store' all of the knowledge in their memories for future use. Thus students need to be equipped with transferable skills

such as critical thinking skills to allow them to address different problems in different contexts at different times throughout their lives. Critical thinking is a fundamental aspect of good teaching because we want students to be lifelong learners. That is the students need to know the complexities of different subjects, the ways by which knowledge is produced and validated, alternative ways of knowing, and the connections among different disciplines. Critical thinking is necessary if we want to foster democratic practices for everybody's children. In order to inculcate these important skills in our students, the teachers who teach them need to be critical thinkers themselves and must be disposed towards them.

Critical thinking skills are important because it will enable one to be more open-minded in the sense that he or she can tolerate the ideas of others (Ten Dam & Volman, 2004). According to Miedema and Wardekker (1999) critical thinking is a primary force in enhancing respect for the opinions of others as well as a centrepiece to a democratic society. This is because critical thinking can help us decide what to believe and what not to (Lipman, 2003). A society where critical thinking is seen as a central value will have citizens who are better aware of what their particular positions are, on issues and thus better able to participate in the development of that society in a more competent manner. However, although dispositions and skills are related they are not interchangeable (Facione, Giancarlo, Facione, & Gainen, 1995). That is, critical thinking skills relate to the cognitive ability to reason and engage in active inquiry, while critical thinking disposition refers to a person's tendency to exercise the skills and enjoy doing so. Thus from the previous statements it can be said that the teachers can have the skills of critical thinking but may not be disposed to carry out for various reasons. One of them could be the self-efficacy towards teaching thinking skills since according to Bandura (1997) self-efficacy is a person's belief in his or her

ability to succeed in a particular situation. Thus, it can be assumed that the possibility of a teacher being more disposed towards critical thinking could be high if his/her self-efficacy towards teaching thinking skills is high.

2.3 TEACHING OF THINKING SKILLS

A major challenge for teacher education programs would be to produce professional teachers who are critical thinkers, who can solve problems and who are committed to learn over a lifetime. According to Facione, et al. (2000) critical thinking is central to reflective thinking, and it is a principled process employing the cognitive skills of interpretation, analysis, inference, explanation, evaluation and self-regulation of thinking recursively. As such the ability to think critically would be important among pre-service teachers since the content of education at this level would require higher order thinking such as the ability to apply critical evaluation, give evidence for their own opinions and be able to argue the validity of facts they receive from their lecturers. Because a skilled teacher will endeavour to highlight the philosophical elements of the children's statements or questions and help them expand their thinking into that area (Lipman, 2003). But just having critical thinking skills is not enough since there are several factors that increase the likelihood that pre-service teachers will develop into critical thinkers.

Critical thinking researchers believe that critical thinking skills can be taught. Several studies, have indicated that improving students' thinking requires teaching of thinking skills and thus in order for the teachers to teach them they need to be trained in teaching thinking skills (Tebbs, 2000; Rosnani & Suhailah, 2003, Abrami, Bernard, Borokhovski, Wade, Surkes, Tamim, & Zhang, 2008; Cosgrove, 2010). Many researches show that individuals are more likely to think critically about areas in

which they have more in-depth knowledge (Kincheloe & Weil, 2004). The explicit identification and instruction of skills associated with critical thinking could also make the individuals develop into critical thinkers. Apart from this, the role of the attitudes and dispositions involved in critical thinking also enable individuals to become critical thinkers (Kincheloe & Weil, 2004). Therefore the teachers who teach these skills to the students themselves need to be highly disposed and in turn be self-efficacious towards teaching thinking skills.

There are two main approaches to teach thinking skills. One is stand-alone approach and the other one is infusion approach (Rosnani & Suhailah, 2003; Hatcher, 2006). In stand-alone approach the thinking skills are taught directly or explicitly through separate courses or instructional units in courses, where the thinking skills are practiced specifically and principles of good thinking are made explicit enough to train students in these skills. In infusion approach the thinking skills are incorporated into all the subjects, which allows students to use the thinking skills in a meaningful context and helps them learn the subject matter deeply.

Some of the experts who support the stand-alone approach are Edward De Bono, Reuven Feuerstein, Nigel Blagg and Matthew Lipman. These experts have also developed thinking skill programs namely Lateral Thinking, Instrumental Enrichment program, Somerset Thinking Skills program and Philosophy for Children program respectively (Rosnani & Suhailah, 2003). In these stand-alone programs explicit instruction in critical thinking skills are taught as a separate course, where critical thinking skills and abilities are emphasized outside the context of specific subject matter.

Some of the proponents of the infusion approaches are Bailin, Case, Coombs, Daniels, Silva, Pithers, Soden, Willingham (Lai, 2011), McPeck and Chambers

(Rosnani & Suhailah, 2003). Some of these researchers like McPeck and Chambers argue that the curriculum is already crowded let alone to include an extra program (Rosnani & Suhailah, 2003). While the others believe that it is easier to learn to think critically within a certain context or domain than explicitly. The programs like Cognitive Acceleration in Science Education (CASE) developed by Philip Adey, Michael Shayer and Carolyn Yates, Cognitive Acceleration in Maths Education (CAME) developed by Michael Shayer and Mundher Adhami, Cognitive Acceleration in Technology Education (CATE) developed by Tony Hamaker and John Backwell, The Thinking/Learning (T/L) System developed by Peter Edwards and Ervin Sparapani, Strategic Reasoning developed by John Glade, Tactics for Thinking developed by Robert Marzano and Mind mapping developed by Tony Buzan can be used in the infusion approach to teach thinking skills (Costa, 1985).

2.4 ISLAMIC PERSPECTIVE ON THINKING

From a religious perspective, whenever one is asked about the element of 'thinking' in a religion, often than not we will come across the answer that religion is more about submission to one's creator, "God", the "Higher Power" or the "Superior Entity". 'Submission' and 'Obedience' plays the most important role in all of the religions but however in Islam blind 'Submission' and 'Obedience' is not supported. In Islam people are asked by Allah (SWT) to think constantly. This may contrast with for example, in Christianity, where the concept of the Trinity could not be easily comprehended by many through rational thinking or proven satisfactorily and scientifically but yet are required to 'Submit' and show 'Obedience'. Therefore element of just having "belief" or "have faith" overrides the importance of "thinking critically" of one's question. However thinking about the essence of a religion had

been the essential element from the very beginning of mankind, as early as from the father of all mankind, Prophet Adam (AW). Prophet Adam (AW) and his wife Hawa (RA) were asked not to eat the fruit as Allah (SWT) says:

“O Adam! Dwell thou and thy wife in the Garden and enjoy (its good things) as ye wish: but approach not this tree, or ye run into harm and transgression.”(Qur’an, *Al A’raaf*: 19).

In the above verse the stating of the reasoning not to eat from the tree from Allah is indicative of the fact that Allah places the importance of thinking. Else he could have just commanded not to eat from the tree without giving any reasons but He did not.

Islam is not only a religion, it is a complete way of life which encompasses all aspects of living. Islamic religion emphasises on the seeking of knowledge. The fact that the first order of Allah to mankind was "iqra'" or read is indicative of the fact the Islam gives importance to the seeking of knowledge. However the fact Allah says *"Proclaim! (or read!) in the name of thy Lord and Cherisher, Who created - Created man, out of a (mere) clot of congealed blood: Proclaim! And thy Lord is Most Bountiful, - He Who taught (the use of) the pen, - Taught man that which he knew not"* (Qur’an, *Al-Alaq*: 1-5) shows that in Islam knowledge for the sake of knowledge is not sufficient. That is knowledge is valuable and virtuous only if it brings recognition of Allah as the Lord and Cherisher of mankind and all other creation.

Unlike in the Western societies where critical thinking is used entirely to succeed in this life, in Islam to engage in critical thinking is a moral commitment because Allah (SWT) wants us to act morally (Kazmi, 2000). This is because we Muslims view this world as a temporary place, it is the transit to the hereafter. Since it is what we do in this world that counts to what will happen in the hereafter.

The true belief in God, angels, the Day of judgement, and the hereafter is essential to Islamic faith. The true belief implying that not just blindly following without actually believing in them. Therefore knowledge is important for a Muslim's intellectual and spiritual growth and development but this can only be achieved if we contemplate and use our critical thinking skills as Allah says:

“Do they not reflect in their own minds? Not but for just ends and for a term appointed, did Allah create the heavens and the earth, and all between them: yet are there truly many among men who deny the meeting with their Lord (at the Resurrection)!” (Qur'an, *Ar-Rum*: 8).

And He also says:

“verily in that are Signs for those who reflect” (Qur'an, *Ar-Rum*: 21).

The most distinctive characteristic of Islam is that Allah (SWT) not only asks the believers to think of His words by repeatedly saying the phrase of “*Don't they see?*” for more than 64 times in the Holy Qur'an, but Allah (SWT) also challenges the non-believers to think and to submit proof had they want to deny the Mercy and the Grace of Allah (SWT). In Qur'an, *Al-Rahman*, the repetition of the verse “*Then which of the favours of your Lord will ye deny?*” after stating of human being's sustenance is a clear challenge and pointers to the thinkers who have a mind to be challenged. Allah (SWT) also says:

“Say: “Do ye see what it is ye invoke besides Allah? Show me what it is they have created on earth, or have they a share in the heavens bring me a book (revealed) before this, or any remnant of knowledge (ye may have), if ye are telling the truth!”” (Qur'an, *Al-Ahqaf*: 4).

Critical thinking process is a process that is carried out confidently by Allah (SWT) by constantly asks mankind to ponder, to wonder, to compare, to decide with facts, information, resources and through one's biggest asset, one's given mind as it is beautifully crafted in Qur'an:



“(Here is) a Book which We have sent down unto thee, full of blessings, that they may meditate on its Signs, and that men of understanding may receive admonition.” (Qur’an, *Sad*: 29).

“Behold! in the creation of the heavens and the earth; in the alternation of the night and the day; in the sailing of the ships through the ocean for the profit of mankind; in the rain which Allah Sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they Trail like their slaves between the sky and the earth;- (Here) indeed are Signs for a people that are wise.” (Qur’an, *Al-Baqarah*: 164).

The constant contemplation of these verses in Qur’an is not only important and encouraged; nonetheless it is vital pointers in leading human being to find of one’s true God and realise the mercy and love of Allah.

Total submission to one’s God and sincere declaration that *lailaaha illahllaaah* (there is no God except Allah) although is the basic declaration of one’s faith. Nonetheless, we as a Muslim, revert or simply a human being is fortunate because our path of finding or acknowledging the One True God is not restrained through the pronouncement of Shahada alone. Allah (SWT) wants us to understand and to think of His creation through observation of His blessings from as simple as the air we breathe, how birds or the wilds are surviving in the wild and through how the sun and the moon run on their fixed courses. Allah (SWT) says:

“Behold! in the creation of the heavens and the earth, and the alternation of night and day,- there are indeed Signs for men of understanding,- Men who celebrate the praises of Allah, standing, sitting, and lying down on their sides, and contemplate the (wonders of) creation in the heavens and the earth, (With the thought): “Our Lord! not for naught Hast Thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire.” (Qur’an, *Al-i-‘Imran*: 190,191).

Further, Allah even warns mankind of what will happen if we do not think deeply:

“(Allah) will say: "Like this, Our Ayat (proofs, evidences, verses, lessons, signs, revelations, etc.) came unto you, but you disregarded them (i.e. you left them, did not think deeply in them, and you turned away from them), and so this Day, you will be neglected (in the Hell-fire, away from Allah's Mercy)." (Qur'an, *Ta ha: 126*).

Thinking is not only vital in Islam, it is also an element to differentiate between a person who merely “follows”, from a true follower who is a result of understanding of the words of Allah (SWT) and being mentally convicted to follow the rules laid down by the Creator. Thinking critically, is a form of worship in Islam because we are not being receptive to the blessings, rather we are appreciating the blessings through thinking. In abiding and applying the thinking skills required in Islam, we will not only move towards creating a new generation of thinkers (ulol-albab), but also we will achieve success in this life and in the hereafter. Critical thinking, having such an important role, had been embedded in Islam as one of the vital element in winning over the hearts of billions. The fact of the statement “Islam is one of the fastest growing religions in the United States” (Stammer, 1996) proves that when a person uses his/her critical thinking in its true sense s/he will find guidance.

The more a person reflects upon the signs and creation of Allah the more s/he will realise the mercy and love of Allah (Syaidatun, 2004) and in his/her love for Allah would develop. This is because the more you reflect the more a person comes to realise the greatness of the Creator and His immense power over all the creation. Thus in return the person gets closer to Allah and would become hesitant to do anything that would displease Him because a true believer loves Allah greatly and, at every moment, s/he would strive to gain His love and good pleasure (Yahya, n.d). This may be vice versa. That is for a person who is already a practicing Muslim, who is already

closer to Allah may reflect more upon the signs of Allah and his love and belief can increase.

2.5 A CONSENSUS DEFINITION OF CRITICAL THINKING

Many of us agree that critical thinking is essential at all levels and in all disciplines of education, but one universally accepted definition of critical thinking does not exist (Dike, Kochan, Reed, & Ross, 2006). There are various definitions of critical thinking.

“Critical thinking is the art of analyzing and evaluating thinking with a view to improving it” (Paul & Elder, 2006. p. 4).

“Critical thinking is, in short, self-directed, self-disciplined, self-monitored, and self-corrective thinking.” (Paul & Elder, 2006. P. 4)

"Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe and do." (Norris & Ennis, 1989, p. 18).

“Critical thinking is the use of analytical reasoning to draw useful conclusions from limited information and verify the truth of a claim or assertion.” (Kindler, 2002. p. vi).

“Critical Thinking is the process of using reasoning to discern what is true, and what is false, in the phrases and "sound bytes" we hear everyday.” (Wood, 2002. p. 1).

“Critical thinking is the art of raising what is subconscious in our reasoning to the level of conscious recognition. It is the art of taking control of our thinking processes so as to understand the pathway and inputs that our thinking employs.” (Egan, 2005. p. 2).

John Dewey calls critical thinking as ‘reflective thinking’. He defines it as: “active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of grounds, which support it and the further conclusions to which it tends” (Dewey, 1933, p. 118).

The author of most widely used test of critical thinking (*Watson-Glaser critical*

Thinking Appraisal) Edward Glaser states:

“the ability to think critically, involves three things: (1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one’s experience, (2) knowledge of the methods of logical inquiry and reasoning and (3) some skill in

applying those methods. He further goes on to say that “critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends” (Glaser, 1941, p. 5-6).

Swartz and Perkins (1990) viewed critical thinking as the “critical examination and evaluation, of actual and potential beliefs and courses of action” (p.37).

From all of the above definitions it is clear that thinking is a skill which is a purposeful act directed towards achieving a goal. If this is so then when we think critically, we use our knowledge and intelligence effectively to arrive at the most reasonable and justifiable position possible by thinking clearly, accurately, knowledgeably and fairly (Carroll, 2004). At the same time it can be said that the critical thinking is a cognitive skill which involves reflection and purposeful act. Critical thinking is a well-developed, powerful way of thinking skill, which is central to learning because learning is a process where an individual modifies or strengthens worldviews, beliefs, opinion, attitudes, behaviours, skills, understanding and knowledge.

Thus, critical thinking is a cognitive and reflective process that encompasses a number of skills and abilities. Many common themes are found within the definitions, including the ability to identify biases and flawed thinking, question assumptions, draw inferences, and be deliberate, systematic, reflective, disciplined, purposeful, fair, and open minded. The experts generally recognize critical thinking as a set of skills (see Figure 2.1) and behaviours that can define an approach to processing information (American Philosophical Association, 1990).

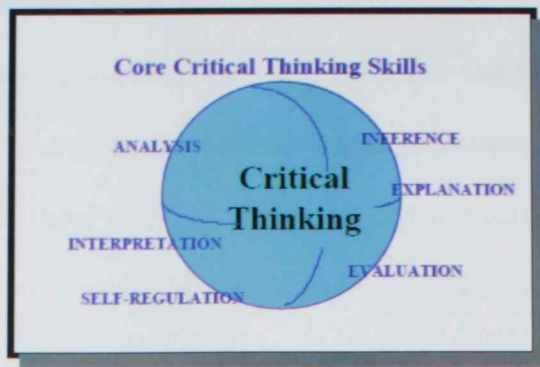


Figure 2.1: Core critical thinking skills by Facione, et al. (2000)

Critical thinking is a matter of having the skills required and at the same time be disposed to use them (Fisher, 2001). Research has found that the more often a student is exposed to critical thinking, the greater the probability that the student will transfer critical thinking to other areas of his or her life (The Critical Thinking Co.TM, 2005). This means the skills are necessary but this does not simply guarantee they will use them in their life unless they are inclined to do so. Therefore, it is important to expose students to critical thinking in education wherever possible and make them align to do so. Thus in order to achieve this objective in our students the teachers themselves must be disposed to carry out critical thinking during the teaching and learning endeavours.

Number of studies conducted among college/university students on critical thinking yields a positive and a significant correlation between critical thinking skills and dispositions (Giancarlo & Facione, 1994; Facione, et al., 1995; Colucciello, 1997; Profetto-McGrath, 2003; Ricketts, 2003; Duphorne & Gunawardena, 2005; Shin, Jung, Shin, & Kim, 2006; Wan Shahrazad, 2009).

The study carried out on 193 high school students by Giancarlo and Facione (1994) found a significant correlation between critical thinking dispositions and

critical thinking skills. Facione, et al. (1995) conducted the research using California Critical Thinking Dispositions Inventory (CCTDI) and California Critical Thinking Skills Test (CCTST) to explore the interrelationship between the disposition toward critical thinking and critical thinking abilities found a positive correlation between critical thinking skills and critical thinking dispositions. Similarly the study carried out by Colucciello (1997) found a positive correlation between critical thinking dispositions and critical thinking skills among 328 nursing undergraduates students. Similarly the study carried out by Profetto-McGrath (2003) on 228 students from all 4 years of baccalaureate nursing program shows that there was a significant relationship between students' overall critical thinking skills and critical thinking disposition scores. The study conducted on 212 youth leaders by Ricketts (2003) using Engagement, Maturity and Innovativeness (EMI) tool and using the researcher developed critical thinking test showed also a positive correlation between critical thinking dispositions and critical thinking skills. The study carried out by Duphorne & Gunawardena (2005) on university nursing students critical thinking dispositions and critical thinking skills of the conference participants were positively correlated ($r = .26$, $p < .05$). The study conducted on senior nursing students enrolled in associate ($n = 137$), baccalaureate ($n = 102$), and RN-to-BSN ($n = 66$) programs by Shin, et al. (2006) using CCTDI and CCTST showed also a positive correlation between critical thinking disposition and critical thinking skills. The study conducted by Wan Shahrazad (2009) to examine the predictive relationships of students' critical thinking dispositions, their perception towards teaching approaches and their learning approaches towards critical thinking skills among university students of Malaysia showed critical thinking dispositions were significantly related to critical thinking skills.

These studies provide evidence that critical thinking dispositions influence critical thinking skills among university students meaning that if one has high critical thinking disposition scores s/he would be likely to have high scores in critical thinking skills as well but not necessarily vice versa. Due to the time constrain the researcher decided to focuses on pre-service teachers' critical thinking disposition than on critical thinking skills along with their self-efficacy towards teaching thinking skills.

2.6 CRITICAL THINKING DISPOSITION

A number of critical thinking definitions include references to disposition or willingness to exercise the skills and behaviours that constitute critical thinking.

“Critical thinking is a general term that is used to refer to two related and yet very different concepts, that is ability and disposition. The former refers to one’s ability to think critically, whereas the latter refers to one’s propensity for thinking critically” (Zhang, 2003. p. 5)

Dispositions are certain propensity to behave in a particular way. John Dewey sees the dispositional aspects of thinking as “*personal attributes*” (Dewey, 1933). Zhang (2003) sees critical thinking disposition as one’s propensity to think critically. Thinking dispositions are tendencies toward particular patterns of intellectual behaviour such as attitudes, values, and habits of mind concerning thinking (Tishman & Andrade, 1996). Ennis (1994) defines a thinking disposition as a tendency to do something given certain conditions. For Facione, et al. (2000) word dispositions refer to characterological attributes of individuals. That is “*human disposition is a person’s consistent internal motivation to act towards, or to respond to, persons, events, or circumstances in habitual, and yet potentially malleable, ways*” (Facione, et al., 2000, p.6).

Many of the philosophers and psychologists have helped in further making clear the differences between the critical thinking skills and the attitude towards practicing critical thinking skills (Fisher, 2002).

Thinking dispositions are tendencies toward particular patterns of intellectual behaviour such as attitudes, values, and habits of mind concerning thinking (Tishman & Andrade, 1996). Similarly some other philosophers of education Stephen Norris and Robert Ennis define a thinking disposition as a tendency to think in a certain way under certain circumstances (Norris, 1994; Ennis, 1994).

Similar to the above mentioned philosophers, psychologist Gavriel Salomon sees thinking dispositions as a cluster of preferences, attitudes and intentions along with a set of capabilities that allow them to be practiced (Salomon, 1994). The authors of CCTDI, Peter and Facione define a thinking disposition as a constellation of attitudes, intellectual virtues, and habits of mind (Facione, et al., 1995). Critical thinking disposition is also seen as a person's willingness or inclination to exercise critical thinking skills and behaviours (Barak, Ben-Chaim, & Zoller, 2007). It has also been described as "*dimensions of one's personality that relate to how likely a person is to approach problem identification and problem solving by using reasoning*" (Giancarlo, Blohm, & Urdan, 2004, p. 348).

Though dispositions and skills are related they are not interchangeable (Facione, et al., 1995). That is, critical thinking skills relate to the cognitive ability to reason and engage in an activity, while critical thinking disposition refers to a person's inclination to exercise those skills and enjoy doing so (Godzyk, 2008). Thus from the previous statements it can be said that one can have the skills of critical thinking but may not necessarily use them.

The three elements which logically must be present in order to spark dispositional behaviour are *sensitivity*, *inclination* and *ability* (Perkins, Jay & Tishman, 1993). One must have the attitude or perception of the appropriateness of a particular behaviour while at the same time liking toward the behaviour and the basic capacity to follow through with the behaviour. Norris (1994) claimed, that one must have the disposition to think productively and critically about issues, otherwise whatever amount of skill the one has is not going to help them to become good critical thinkers.

A good thinker possess specific cognitive abilities, thinking strategies and skills. what sets good thinkers apart from a poor thinker is not only the superiority in cognitive abilities, thinking strategies or skills but rather their “thinking dispositions” such as tendencies to explore, to inquire, to seek clarity, to take intellectual risks, to think critically and imaginatively (Tishman, Perkins & Jay, 1995). Thus to be a good thinker means having the skills and correct thinking dispositions. The correct thinking dispositions here imply that they would lead to make ethically correct decisions.

The Delphi Project which was conducted by Facione (1990) by assembling 42 experts in critical thinking identified list of dispositions that are needed to be a good critical thinker. Facione and his colleagues developed the CCTDI to measure a person’s disposition toward thinking critically. The CCTDI consists of 75 Likert-type response statements that reflect seven scales (Facione, et al., 1995). The scales, or factors, reflect seven categories namely truth-seeking, open-mindedness, systematicity, inquisitiveness, analyticity, cognitive maturity and self-confidence as attributes of a good critical thinker. Truth-seeking measures the intellectual honesty which gives one the courageous desire for best knowledge in any situation, the inclination to ask challenging questions and to follow the reasons and evidence wherever they lead. Open-mindedness measures tolerance for new ideas and divergent views.

Systematicity measures the inclination to be organized, including to be focused, diligent, and persevering in inquiry. Inquisitiveness measures intellectual curiosity and the intention to learn things even if their immediate application is not apparent. Analyticity measures alertness to problem situations and potential difficulties which means being alert to the need to intervene by the use of reason and evidence to solve problems. Cognitive maturity measures judiciousness which inclines one to see the complexity in problems and to desire prudent decision making. Self-confidence measures the trust one places in one's own reasoning and one's ability to guide others to rational decisions (Facione, et al., 1995). Facione (1990) refers to these dispositions as approaches to life that characterises critical thinking.

Another similar tool that is also based on the Delphi report was developed by Ricketts (2003) and his colleagues which consist of three subscales Engagement, Maturity and Innovativeness. The Engagement disposition measures students' predisposition to look for opportunities to use reasoning; anticipate situations that require reasoning; and confidence in reasoning ability. The Cognitive Maturity (Maturity) disposition measures students' predisposition to being aware of the complexity of real problems; being open to other points of view; and being aware of their own and others biases and predispositions. The Innovativeness disposition measures students' predisposition to be intellectually curious and wanting to know the truth (Ricketts, 2003). This tool known as EMI assessing critical thinking disposition is used in this research.

Facione, Facione and Gainacarlo (1996) claimed, "The overall disposition toward critical thinking is the consistent internal motivation to employ one's critical thinking abilities in judging what to believe or to do in any situation" (p. 4). The fact that a person uses a skill is evidence that the person is disposed to use that skill, (Ennis,

1994; Perkins, et al., 1993). Critical thinking disposition is the will to exercise critical thinking skills. Without critical thinking dispositions, an individual will not necessarily use his or her critical thinking skill unless he or she is disposed to do so (Facione, 2007). Therefore if a person is capable of thinking critically but chooses not to would not be considered to be a critical thinker.

There are several factors that increase the likelihood that people will develop into critical thinkers. Research shows that individuals are more likely to think critically about areas in which they have more in-depth knowledge (Kincheloe & Weil, 2004). The explicit identification and instruction of skills associated with critical thinking could also make the individuals develop into critical thinkers. Apart from this, the role of the attitudes (how a person feels towards something) and dispositions involved in critical thinking also enable students to become critical thinkers (Kincheloe & Weil, 2004). If so then the self-efficacy towards teaching thinking skills could be one of the factors that can have a profound impact on whether the educators would be disposed towards using critical thinking in their teaching endeavours. Thus this research focuses on investigating the critical thinking disposition and self-efficacy levels towards teaching thinking skills of pre-service teachers.

2.7 RESEARCH ON CRITICAL THINKING DISPOSITION

Literature revealed that there have been several studies conducted on critical thinking disposition in number of different disciplines.

Zhang (2003) conducted a study on Chinese university students on their critical thinking disposition and their thinking styles and found a positive correlation between critical thinking disposition and thinking styles. Barile (2003) conducted a study on eleven elementary school principals to find how the problem solving and decision

making is affected by one's critical thinking disposition and the study found a positive relationship between critical thinking disposition and effective problem-solving strategies.

Number of studies has been conducted in health related disciplines on critical thinking disposition. Evancho (2000) examined whether educational level had a relationship to critical thinking abilities and dispositions, as measured by the CCTST and CCTDI, with a sample of 24 nursing students and found no significant difference. Tiwari, Avery and Lai (2003) conducted a study among Hong Kong Chinese and Australian nursing students to compare their critical thinking dispositions which revealed significant differences in their critical thinking dispositions between the two groups of students ($p < 0.05$), with the Hong Kong Chinese students failing to show a positive disposition toward critical thinking on the CCTDI total mean score, while the Australian students showed a positive disposition. Shin et al. (2006) conducted a study in South Korea to examine the critical thinking skills and dispositions in nursing students enrolled in different academic programs. A total of 305 students were sampled from Associate, Baccalaureate, and RN-to-BSN programs. A statistically significant difference between students in the different programs was reported. Park and Kim (2009) conducted a study on critical thinking disposition and clinical competence among nurses in general hospitals and found a positive correlation between critical thinking disposition and clinical competence. Wangenstein, Johansson, Björkström and Nordström (2010) conducted a study on critical thinking disposition of newly graduated nurses in Norway and the study showed 80% of the responded positive towards critical thinking disposition.

Another study was conducted on critical thinking disposition but in another field was carried out by Giancarlo and Facione (2001) to examine critical thinking

dispositions using CCTDI at a four year, private, liberal arts university. Dispositions were assessed in 1992 and again in 1996 prior to graduation. There were a total of 1117 students who participated in the study, with a total of 147 students participating in both years. By examining mean scores using CCTDI when students were freshman and then again when they were seniors, Giancarlo and Facione (2001) found that the increases in mean scores were statistically significant for the overall disposition score. They also found a positive correlation between critical disposition and academic achievement. However, when Emir (2009) conducted a study on 279 students studying at Istanbul University, Turkey in Education faculty using CCTDI to determine whether education faculty students' critical thinking disposition differ according to academic achievement or not, it was found just a weak correlation between the critical thinking disposition and academic achievement and showed no meaningful significance.

Apart from these, literature outlining critical thinking dispositions and their relationship to demographic and some other variables were reviewed.

2.7.1 Critical thinking disposition and academic programs

Not many studies were located that was done on different programs of study and critical thinking disposition. Lampert (2005) conducted a study to compare the difference between arts and non-art students' critical thinking disposition using CCTDI. This study was carried out on 141 undergraduate students from two disciplines in a public university in U.S and the study showed no significant difference on overall mean CCTDI scores between arts and non-arts students however the arts students were found to have significantly higher mean scores on several of the

subscales within the research instrument: truth-seeking, maturity, and open-mindedness and it showed significant difference between the juniors and seniors.

2.7.2 Critical thinking disposition and age

Some studies conducted by number of researchers show age as having no significant difference or relationship to critical thinking (Cillizza, 1970; Rudd, Baker & Hoover, 2000; Thompson 2001; Racchini, 2007; Cohen, 2010).

Cillizza (1970) conducted a study on 300 seventh and eighth grade students to construct and validate a test of critical thinking ability and this study showed as age having no significant relation with critical thinking ability. Similarly the study conducted by Rudd, et al. (2000) on 174 students from College of Agriculture at the University of Florida showed age as having no significant relationship with critical thinking disposition measured using CCTDI. Likewise Racchini (2007) study which was carried out on 258 Certified Athletic trainers using CCTDI to measure their critical thinking dispositions revealed as age having no relationship to critical thinking dispositions. Both Cohen (2010) and Thompson (2001) studies showed age neither the gender to have an important relationship with critical thinking. Thompson conducted the study on 105 students from Mid-America Baptist Theology seminary Cohen (2010) conducted the study on 137 first and second year post professional graduate athletic training students.

2.7.3 Critical thinking disposition and gender

While some studies on gender show no significant differences and no positive relationship with critical thinking (Thompson, 2001; Ricketts, 2003; Cohen, 2010) there are few other studies that shows there is a significant difference on critical

thinking (Facione, et al., 1995; Walsh, 1997; Walsh & Hardy, 1999; Rudd, et al., 2000; Yenice, 2011).

Ricketts (2003) conducted the study on 212 youth leaders from 50 different states using EMI tool and the researcher developed critical thinking test to identify and predict the critical thinking skills of selected youth leaders in the National FFA Organization. The results did not show a positive correlation between critical thinking dispositions and gender. However the study conducted by Facione, et al. (1995) to explore the interrelationship between the disposition toward critical thinking and critical thinking abilities found a positive correlation between critical thinking and gender. Similarly the study conducted by Walsh (1997) among 499 male and female undergraduate students disposition toward critical thinking across gender and major showed that gender was a variable predicting variance in critical thinking disposition. Likewise when Walsh and Hardy (1999) examined dispositional differences among 334 baccalaureate undergraduates using CCTDI gender was found to have a significant difference on critical thinking dispositions. Also the study conducted by Yenice (2011) to examine pre-service science teachers' critical thinking dispositions and problem solving skills using CCTDI and "problem solving inventory" showed that the pre-service science teachers' critical thinking disposition scores differ significantly based on gender in favour of female students in open mindedness subscale but not in analyticity, curiosity, self-confidence, search for truth and systematicity subscales. This study was conducted on 124 students from Adnan Menderes University, Education Faculty, Primary Education Section Science Education Department in 2008 to 2009.

2.7.4 Critical thinking disposition and academic achievement

Similar to gender some studies on GPA shows no significant differences in critical thinking (Stewart & Dempsey, 2005; Emir, 2009; Cohen, 2010) while few other studies shows there is a significant difference on critical thinking (Walsh & Hardy, 1999; Ip, Lee, Lee, Chau, Wootton & Chang, 2000; Giancarlo & Facione, 2001).

The study conducted by Stewart and Dempsey (2005) to examine the critical thinking disposition of nursing students using CCTDI, they found there was no significance difference between their critical thinking dispositions and their test scores. Similarly when Emir (2009) conducted a study on 279 students studying at Istanbul University, Turkey in Education faculty using CCTDI it was found GPA and critical thinking dispositions have no relationship. However the study conducted by Ip, et al. (2000) to explore whether 122 undergraduate nursing students at a selected university in Hong Kong display dispositions towards critical thinking, they found the students showed negative dispositions towards critical thinking and showed a significant positive relationship between their critical thinking dispositions as measured by CCTDI and GPA.

Though there have been several studies conducted on critical thinking disposition in different disciplines of study but only very few studies (Emir, 2009; Yenice, 2011) have been conducted on students in education faculty. In addition the studies conducted previously shows age having no relationship with critical thinking due to the assumption made in this study it would be assessed to see whether there is any relationship with critical thinking disposition in this study. The gender and GPA are entered in this study as variables that could have a significant difference on critical thinking disposition based on the aforementioned inconclusive findings and further find the pre-service teachers critical thinking dispositions.

2.8 SELF-EFFICACY TOWARDS TEACHING THINKING SKILLS

It is undebatable that qualified teachers must be knowledgeable and be able to apply effective teaching techniques to enhance students thinking skills. Whether these will yield critical thinking among students depend on the teacher, since it is the teacher's skills, beliefs, attitudes, perceptions, opinions, personality, knowledge, among many other factors, that affect the choices s/he makes about what, when, and how to teach thinking skills that matters. Consequently, if teachers have low self-efficacy towards teaching thinking skills it is unlikely that knowledge, skills and ability will do much good. This is because as Bandura (1997) states self-efficacy is "*beliefs in one's capabilities to organize and execute the course of action required to produce given attainments*" (p. 3). This implies self-efficacy is self-perception(s) held by an individual regarding their abilities to perform in a given situation. If this is so then self-efficacy can influence a person's choices, actions, the amount of effort they give, how long they persevere when faced with obstacles, their resilience, their thought patterns and emotional reactions, and the level of achievement they ultimately attain (Bandura,1986). This is also in line with the findings of Pajares (1996), he says:

"knowledge, skills and prior attainments are themselves influenced by the beliefs that people come to hold. Knowledge, skills and prior attainments are poor predictors of subsequent performance when they are not in concert with an individual's beliefs" (as cited in Tebbs, 2000).

Therefore, in short self-efficacy beliefs will determine to what extent people will try to cope with the situation(s). Self-efficacy plays an important role in one's life because it helps the person on how to act, feel and think (Pintrich & Schunk, 1996). If this is so, then teachers' actions and behaviours would be related to their beliefs, perceptions, assumptions and motivational levels (Chacón, 2005). Thus pre-service teachers' self-efficacy towards teaching thinking skills can be defined as their belief in

their capabilities to teach thinking skills effectively. And according to Bandura (1977) self-efficacy is a powerful force in ones learning and motivation to carry out a certain task thus this could mean it can also be a powerful force to make pre-service teachers disposed towards teaching thinking skills. The research carried out by Davies (2004) found out that the teachers with greater sense of self-efficacy placed a greater emphasis on higher order instructional objectives and outcomes, than the teachers with a lower sense of self-efficacy. Therefore, if pre-service teachers are expected to be effective in teaching thinking skills, it is essential that they have positive attitudes and high self-efficacy towards teaching them because if they are not confident and not self-efficacious towards teaching thinking skills it is likely they will try to avoid doing so.

Teachers' self-efficacy in general is defined as teacher's belief in his/her abilities to influence students' performance (Ashton & Webb, 1986; Bandura, 1997). Research findings from previous studies show when teachers have high self-efficacy they promote development of a secure, accepting classroom atmosphere (Ashton & Webb, 1986; Gibson & Dembo, 1984; Tuckman & Sexton, 1990) and thus the students motivation and achievement is affected positively (Ashton & Webb, 1986).

Therefore it is of vast importance that teacher education programs should improve pre-service teachers' belief in themselves and these programs should instil and improve pre-service teachers' self-efficacy towards teaching thinking skills in order to achieve the specified curriculum goals. According to the research carried out by Rosnani and Suhailah (2003) teachers who had obtained training in teaching thinking skills through formal, short in-service courses scored higher in their self-efficacy than those who had not obtained any training. Therefore it is of vast importance that the education programs must teach thinking skills to these pre-service

teachers so that they would be able to think critically before teaching them in their classrooms. The pre-service teachers should also be taught how to integrate the thinking skills in their curriculum and how to be model thinkers for their students (Walsh & Paul, 1988). In order to make sure these are achieved first and foremost the teacher educators need to be aware of the pre-service teachers' level of self-efficacy towards teaching thinking skills. Thus, measuring pre-service teachers' self-efficacy beliefs in this area will allow a better understanding of their behaviours and enable the teacher educators take necessary steps to improve or modify the teacher education programs to benefit the students.

Self-efficacy is domain specific (Pajares, 1996). If so a person can have low self-efficacy in one domain while at the same time s/he may have high self-efficacy in another. For example a pre-service teacher may have high teaching self-efficacy but may not necessarily have high self-efficacy in teaching thinking skills to be specific. Therefore self-efficacy being a psychological construct can be investigated in different disciplines such as nursing, sports, education and so forth. Since it is domain specific it can be also evaluated in specific domains like in the area of teaching thinking skills.

2.9 RESEARCH ON SELF-EFFICACY

A number of researches (Gibson & Dembo, 1984; Ashton & Webb, 1986; Woolfolk & Hoy, 1990) have been carried out to examine the role of self-efficacy in various effective teaching outcomes.

The study conducted by Gibson & Dembo (1984) on 208 elementary school teachers showed low-efficacy teachers were confused if there was any interruption of their routine while they were engaged with small groups, whereas the high-efficacy teachers seemed to utilize this format with more ease and flexibility. Similarly the

study conducted by Ashton & Webb (1986) on teachers showed that teaching self-efficacy plays a significant role in teacher attitude and behavior, and that teaching self-efficacy is consistently related to students' academic achievement. According to a study carried out by Pintrich and Schunk (2002) the self-efficacy beliefs impact motivation and performance.

Another domain that was researched was on teachers' sense of efficacy and beliefs about controlling the students. The study conducted by Woolfolk & Hoy (1990) on 182 prospective teachers in a state university in U.S. showed TE (Teaching Efficacy) and PE (Personal efficacy) were significantly negatively correlated with bureaucratic orientation. Neither TE nor PE was related to motivational style and only TE was related to pupil control ideology.

The role of self-efficacy in content areas such as mathematics and science has been researched to determine how teachers' view their own effectiveness and abilities. Some studies have found positive correlations between teacher efficacy and student achievement (Ashton & Webb, 1986; Goddard, Hoy & Woolfolk 2000). The study conducted by Goddard, Hoy & Woolfolk (2000) on 70 teachers from 70 different schools from U.S. to test the psychometric properties of the collective Teacher Efficacy showed that the collective teacher efficacy was positively associated with differences between schools in student-level achievement in both reading and mathematics. Similarly the study conducted by Jerald (2007) on teacher self-efficacy, identified that teachers with higher levels of self-efficacy were open to new ideas and were more actively engaged in the planning process of student activities than those who had lower self-efficacy. Likewise Pajares and Miller (1994) found that self-efficacy was a strong predictor of mathematics performance among undergraduate students enrolled in the college of education.

Phelps (2009) conducted a study on 61 pre-service teachers to investigate the mathematics self-efficacy and learning goals of pre-service elementary teachers and to study pre-service teachers' perceptions of how those mathematics self-efficacy beliefs and learning goals developed over time. The study showed that the participants ($n = 22$) believe past performance, vicarious experiences, verbal persuasions, career goals, and the nature of mathematics in their classes influenced the development of their mathematics self-efficacy and learning goals. Smolleck & Mongan (2011) is another study conducted on pre-service teachers' self-efficacy beliefs. This study was conducted on 38 pre-service elementary teachers from a central Pennsylvania university, U.S. to investigate the self-efficacy beliefs of pre-service elementary teachers as well as the extent to which self-efficacy may change over time from the year 2006 to 2011. The study showed a positive change for self-efficacy and outcome expectancy throughout the data collection period.

Yılmaz & Çavaş (2008) conducted a study on 185 pre-service elementary teachers from two different universities in Izmir, Turkey to investigate the effect of the teaching practice on pre-service elementary teachers' science teaching efficacy and classroom management beliefs. The study indicated that almost all pre-service elementary teachers had high self-efficacy beliefs regarding science teaching. While, pre-service elementary teachers' classroom management beliefs tended to change with the teaching practice, the pre-service elementary teachers' science teaching efficacy beliefs were not affected by the teaching experience.

In addition to assessing the teachers' self-efficacy number of studies have been conducted to assess pre-service teachers' self-efficacy in different areas such as their self-efficacy towards teaching in general (Ritchie, 2006; Yılmaz & Çavaş, 2008; Courtad, 2009) and teaching subject specific areas (Bursal, 2009; Phelps, 2009;

Smolleck & Mongan, 2011) by number of researchers. Pajares and Miller (1994) found that self-efficacy was a strong predictor of mathematics performance among undergraduate students enrolled in the college of education. Ritchie (2006) conducted a study on 115 pre-service teachers from the colleges of education at two large metropolitan universities in Texas to determine if any statistically significant difference exists between the self-efficacy scores of student teachers who began their college experience at the community college level and student teachers who began their education at the university level. The results of this study indicated that pre-service teachers, regardless of their initial college experiences, felt similarly confident in their teaching abilities.

Apart from the aforementioned studies the studies that relates to self-efficacy and teaching thinking skills are studies conducted by Kaya (2008), Tebbs (2000), Rosnani & Suhailah (2003) and Baysal, Arkan, & Yildirim (2010). In Kaya (2008)'s study to evaluate self-efficacy levels of social studies pre-service teachers in the teaching of thinking skills it was found that there was a weak relationship between the self-efficacy levels and the teaching thinking skills of the pre-service teachers (as cited in Baysal, et al., 2010). Tebbs (2000) conducted a study on 432 professional K-12 teachers in New England schools to investigate their self-efficacy level towards teaching thinking skills. The study found that the teachers had a lower self-efficacy level in the factor Teaching for Transfer than in the factor Creating a Classroom Fit to Think. Overall these teachers were found to have an average level ($M = 3.57$, $SD = .63$) of self-efficacy towards teaching thinking. These teachers were not satisfied concerning the training provided with respect to teaching thinking skills. The study conducted by Rosnani & Suhailah (2003) on 337 professional secondary school teachers in the state of Selangor, Malaysia to investigate teachers' perceptions and

practices of teaching thinking showed that the teachers were not very confident ($M = 3.07$) in teaching thinking skills. The study also revealed a statistically significant moderate, positive correlation ($r = 0.46$) between the belief sub-scales (Efficacy and Value combined) and the practice sub-scale (Lower Order Thinking Skills (LOTS), Higher Order Thinking Skills (HOTS), Teaching strategies (TSTRAT) and Teaching behavior (TBEHAV) combined) at $\alpha = 0.05$. Baysal, et al. (2010) conducted a study on 263 third and fourth year pre-service teachers from the Elementary Teacher Education Department of Marmara University, Istanbul during 2009-2010 to investigate their self-efficacy level towards teaching thinking skills. The study found that the teachers had a lowest self-efficacy level in the factor recognising How Students Think. The self-efficacy level of third year-students ($X = 86.19$) was lower than that of fourth-year students ($X = 87.05$). However, no meaningful difference was found between the two years of study ($p > .05$). Thus the study found that the pre-service teachers self-efficacy in teaching thinking skills quite sufficient, and that their self-efficacy did not vary by year of study.

The studies that relate closely to self-efficacy and critical thinking disposition that was located were carried out by Yüksel and Alcı (2012) and Dyer and Roberts (2005). Yüksel and Alcı (2012) conducted a study on 104 teacher candidates enrolled in English Language Teaching Certificate program run by Yildiz Technical University, Lifelong Learning Center, Turkey to investigate to what degree the teacher candidates' sense of self-efficacy and critical thinking dispositions predict their success in school practicum course. The instruments used were *Turkish Teachers' Sense of Self-Efficacy Scale* developed by Çapa, Çakiroglu & Sarikaya (2005) and *California Critical Thinking Dispositions Inventory* (CCTDI) developed by Facione, Sanchez and Facione (1994) (cited in Yüksel and Alcı, 2012). The study found a significant

correlation between pre-service teachers', self-efficacy and critical thinking dispositions and school practicum points and critical thinking dispositions. However, no significant correlation was found between TSE and school practicum points. The study also revealed that the females' critical thinking dispositions were higher than males, but lower in teachers' self-efficacy than males. Dyer and Roberts (2005) conducted a study on 322 students enrolled in the online sections of a University of Florida course, to investigate the relationship of motivation, self-efficacy, and critical thinking disposition to student achievement and attitudes in the presence of demographic variables. The instruments used were Motivation Strategies for Learning Questionnaire (MSLQ) developed by Pintrich, Smith, Garcia and McKeachie (1991), self-efficacy instrument developed by Riddle (1994) and Engagement, Maturity, and Innovativeness (EMI) Critical Thinking Disposition assessment by Ricketts (2003) (cited in Dyer and Roberts, 2005). The study found the average participant was highly motivated, exhibited high levels of self-efficacy, and had high critical thinking dispositions.

2.9.1 Self-efficacy and academic programs

Courtad (2009) conducted a study to compare the teaching efficacy of 90 pre-service teachers in two different programs: general education program and special education program from a Midwestern university, US. The study showed, there was no statistically significant difference in the TSES sum scores between the pre-service teachers preparing to be general educators and those preparing to be special educators on any of the three measurement scales.

In another study on to compare self-efficacy level in different academic programs, Bursal (2009) conducted a research on Turkish pre-service elementary

teachers in their personal mathematics teaching efficacy (PMTE) and personal science teaching efficacy (PSTE) at the end of their teacher education program. The study showed their PSTE scores were lower than their PMTE scores but there was a significant correlation between the two scores.

2.9.2 Self-efficacy and age

The studies conducted by some of researchers show age as having no significant difference or relationship to self-efficacy (Kaya, 2008 (cited in Baysal, et al., 2010); Tebbs, 2000). There are few other studies on self-efficacy in domains other than teaching thinking skills that show there is a significant difference on self-efficacy (Ritchie, 2006; Scoles 2011; Templin, 2011). In Ritchie (2006) it shows as age having a positive correlation with self-efficacy.

2.9.3 Self-efficacy and gender

While some studies on gender shows no significant differences and no positive relationship with self-efficacy (Tebbs, 2000; Alshalaan, 2006; Ritchie, 2006; Yılmaz, & Çavaş, 2008; Bursal, 2009) there are few other studies that shows there is a significant difference between gender and self-efficacy (Hepler, 2008; Topkaya, 2010; Dehghani, Sani, Pakmehr, & Malekzadeh, 2011; Eberle, 2011).

2.9.4 Self-efficacy and academic achievement

In the study conducted by Courtad (2009) to investigate teaching self-efficacy of general and special education pre-service teachers he found no relationship of GPA with self-efficacy of the pre-service teachers. While in the study conducted by Peggy, Sullivan & Guerra (2007) they found there was a relationship.

Though there have been several studies conducted on self-efficacy of teachers and pre-service teachers but only very few studies (Tebbs, 2000; Rosnani & Suhailah, 2003; Baysal, et al., 2010) have been conducted on self-efficacy towards teaching thinking skills. And there is only one research (Yüksel and Alcı, 2012) done specifically on critical thinking disposition and self-efficacy of pre-service teachers. Another similar study was done to find the relationship of self-efficacy and critical thinking disposition to achievement and attitudes of student in an online learning environment but not for pre-service teachers or for teachers (Dyer & Roberts, 2005). This study found that a correlation was there between self-efficacy and critical thinking disposition and also there was a correlation between self-efficacy and motivation and with achievement.

Only one study has been found that has been done in Maldives to find the teachers practices of teaching thinking skills. This study by Nazira (2011) was conducted on 354 students to investigate their teachers' practices of teaching thinking skills and the students' decision making styles in Maldives. The findings of this study reveal 25.5% of students stated that the teachers always use higher order thinking skills. This study also showed that 52% of students stated that the teaching strategy teachers always use to enhance students' thinking is based on Blooms Taxonomy. Findings of this study also revealed that only 17.8% of the students said that their teachers always used story telling while 11% of students said the teacher never used story telling. Findings also reveal that there is no significant difference in teachers' practices of teaching thinking with regard to grade level and type of school.

Therefore this research will also contribute to the findings regarding teaching thinking skills in Maldives.

2.10 CONCLUSION

In summary, there are wide ranges of research conducted on different parts of the world regarding self-efficacy and critical thinking disposition but no articles or empirical studies specifically addressing pre-service teachers' self-efficacy towards teaching thinking and critical thinking disposition were located. The literature review indicates that the level of self-efficacy of teachers towards teaching thinking skills and their critical thinking disposition may have a profound impact on the students' achievement and their thinking skills. The literature review shows the importance of teaching thinking skills and thus the teachers need to be competent in teaching their students. For them to be competent they need to be highly self-efficacious and disposed towards teaching thinking skills. As justified previously it would be useful to find out the pre-service teachers self-efficacy towards teaching thinking and their critical thinking disposition. No concrete evidence is available to determine whether the pre-service teachers at MNU are confident or self-efficacious in teaching thinking skills and inclined towards critical thinking skills. This need to be found out since the new curriculum to be implemented emphasizes strongly on developing critical thinking skills in the students. In order for this to be carried out competently by the teachers, the teacher needs to be themselves self-efficacious and disposed toward teaching thinking skills. Thus the future teachers' level of self-efficacy and critical thinking disposition need to be investigated. Apart from this Maldives do not have any research conducted on any of the pre-service teachers in this area.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

The purpose of this cross-sectional descriptive study is to measure pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking dispositions. This chapter addresses the research design that was employed, the population and sample, the sampling procedure, instrumentation, data collection, data preparation and how the data was analysed.

This study is to find out the pre-service teachers' self-efficacy towards teaching thinking skills and their disposition towards critical thinking in MNU. Demographic variables was used to distinguish between self-efficacy towards teaching thinking skills and critical thinking disposition with respect to gender, GPA and the teacher education program within the first degree level teacher education programs conducted in MNU. The study also investigated overall self-efficacy towards teaching thinking skills and critical thinking disposition of the pre-service teachers in each of the first degree level teacher education programs. Further, the study also examined whether there exists a relationship between self-efficacy towards teaching thinking skills and their critical thinking disposition among the pre-service teachers.

3.2 RESEARCH DESIGN

This study used a quantitative research design using the survey approach in collecting the data. Graziano and Raulin (2000) believes that, surveys can be used in social science for studying what people are thinking or feeling about specific issues or events

since it is widely used to learn about different type of people's ideas, knowledge, attitudes, feelings, beliefs, and behaviour. The choice of quantitative method employed in this research is based upon the premise that it will allow the researcher to use one set of data to infer the characteristics of other, similar populations. And the research problem and questions posed in chapter one would be best addressed through quantitative inquiry and survey methods are relatively inexpensive and less time consuming compared to other methods of data collection. Thus the quantitative design allowed the researcher to identify and compare the prevalence self-efficacy levels towards teaching thinking and their critical thinking dispositions among final year pre-service teachers in the Faculty of education of MNU.

A survey data collection technique was chosen so the researcher can be positioned objectively while providing a snapshot in time about pre-service teachers' self-efficacy towards teaching thinking skills and their disposition towards critical thinking. This is also a correlational study, to find if there is any relationship between the self-efficacy towards teaching thinking skills and critical thinking dispositions.

3.3 POPULATION AND RESPONDENT OF THE STUDY

A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. All individuals or objects within a certain population usually have a common, binding characteristic or trait (Castillo, 2009). According to Vogt (2005) population is a group of individuals that one wants to describe and according to Salkind (2003) it is a group of people who possess distinguishing characteristics. A target population is a subset of a larger population that can be more easily identified and studied than the general population.

Thus the population for the current study are all pre-service teachers in the final year undergraduate teacher education programs in MNU in the year 2012. Though there are other pre-service teachers in other levels of teacher education programs conducted at MNU only the undergraduate pre-service teachers are chosen in order to maintain the commonality among the group and only the final year final semester pre-service teachers in these undergraduate programs are chosen because it is assumed that by then all of the pre-service teachers would have completed at least 2 teaching practicum. The importance of having completed the teaching practicum is significant in order to answer the questions in self-efficacy towards teaching thinking skills tool.

This institution has a total enrolment of approximately 4890 students out of which the undergraduate teacher education programs conducted at MNU has a total enrolment of approximately 387 students (Maldives National University Annual Report, 2011). The MNU conducts 4 different undergraduate teacher education programs namely Bachelor of Teaching (Secondary), Bachelor of Education (primary), Bachelor of Arts in Teaching English as a Foreign Language and Bachelor of Teaching Islam (Hon). However at the time of research collection there are 3 different teacher education programs which happens to have final year undergraduate students in the year 2012. This is due to the fact, prior to 2010 Bachelor of Education (primary) program was a 3-year program and it was changed to a 4-year program afterwards. Thus there are 77 pre-service teachers in the final year final semester of the undergraduate teacher education programs in 2012. The Table 3.1 shows the number of pre-service teachers enrolled in the final semester of the final year in the three chosen undergraduate teacher education programs conducted at MNU.

Table 3.1

Total number of final semester of the final year undergraduate pre-service teachers at MNU

Undergraduate teacher education programs	Population size		
	Male	Female	Total
Bachelor of Arts in Teaching English as a Foreign Language	4	19	23
Bachelor of Teaching Islam (Hon)	5	5	10
Bachelor of Teaching (Secondary)	9	35	44
Total	18	59	77

Due to the small number of the population, the researcher decided to include all members of the population in this research as the subjects of this study. The researcher distributed questionnaires to all 77 pre-service teachers except from 3 pre-service teachers returned the questionnaires back. Hence the researcher was able to get data from 74 pre-service teachers out of 77 pre-service teachers studying in the final semester of the final year of the 3 undergraduate teacher education programs. Table 3.2 gives the number of pre-service teachers surveyed from each of the teacher education programs.

Table 3.2
Number of participants in the study

Undergraduate teacher education programs	Total	Participants
Bachelor of Arts in Teaching English as a Foreign Language	23	23
Bachelor of Teaching Islam (Hon)	10	10
Bachelor of Teaching (Secondary)	44	41
Total	77	74

3.4 INSTRUMENTATION

This study used two survey instruments to identify the participants' self-efficacy towards teaching thinking skills and critical thinking disposition and other demographic variables.

In order to find self-efficacy of pre-service teachers towards teaching thinking skills a part of a well-established survey questionnaire The New Millennium Mind Survey developed by Tebbs (2000) was used and was named Self-efficacy Towards teaching thinking Skills.

The researcher examined three survey instruments that specifically target a person's disposition to think critically as opposed to a person's ability to exercise critical thinking skills. They are the California Critical Thinking Disposition Inventory (CCTDI), Engagement, Maturity and Innovativeness (EMI) Critical thinking disposition Assessment and California Measure of Mental Motivation (CM3). Few other instruments focus exclusively on critical thinking skills. Several published instruments, such as The California Critical Thinking Skills Test, The Cornell Critical Thinking Tests, Critical Reasoning Test Battery, James Madison Test of Critical Thinking, Watson-Glaser Critical Thinking Appraisal, and the Ennis-Weir Critical Thinking Essay Test focus primarily on critical thinking skills and only tangentially address the critical thinking disposition. The CM3 was not selected because it targets primarily elementary and secondary school students (Giancarlo et al., 2004). Though CCTDI can be used to measure critical thinking disposition for the target group it was not selected because it has more than 70 items compared to EMI which has 26 items. Another reason for selecting this instrument is because of its high Cronbach's alpha value that is the reliability measure.

Thus pre-service teachers' critical thinking disposition would be measured using Engagement, Maturity and Innovativeness (EMI) Critical thinking disposition Assessment which was developed by Irani, Rudd, Gallo, Ricketts, Friedel, & Rhoades (2007).

After including the demographic variables and the two survey instruments mentioned, one questionnaire was made consisting of three sections (see Appendix I).

Section A – Demographic variables

Section A of the questionnaire (see Appendix I) consisted of demographic information about the Pre-service teachers. This section was developed by the researcher. The questions involved were gender, age, GPA and teacher education program of the participant.

Section B – Self-efficacy towards teaching thinking skills

Section B of the questionnaire (see Appendix I) consisted of 26 items that examined the level of self-efficacy of pre-service teachers' with respect to their ability to teach thinking skills. These items were adopted from The New Millennium Mind Survey developed by Tebbs (2000).

The items were categorised into four dimensions namely: Creating a Classroom Fit to Think, Teaching Higher Order Thinking Skills, Teaching for Transfer and Recognise How Students Think (see Table 3.3). The pre-service teachers were required to respond to each item by circling a number on the questionnaire that employed a five-point Likert scale of confidence, that is 1 for "no confidence"– NC, 2 for "little bit confidence"– LC, 3 for "moderately confident"– MC, 4 for "very confident"– VC or 5 for "fully confident"– FC. The number they chose indicated their perceived level of self-efficacy towards the specific operation defined by the item and

was indicative of the score for that item. To calculate a total score for each participant the scores of each item was added. The scores for 26 items were summed to give a total perceived level of self-efficacy towards teaching thinking skills for each participant, with 130 representing the maximum score and 26 representing the minimum score. The scores were also calculated for each dimension or subscale. High scores indicate high perceived level of self-efficacy towards teaching thinking skills and low scores indicate low perceived level of self-efficacy towards teaching thinking skills. A total score below 61 means low level of self-efficacy, a score between 61 and 96 means average level of self-efficacy and a score above 96 means high level of self-efficacy towards teaching thinking skills (see Table 3.4). Similarly the mean score were also calculated for each dimension or subscale. High mean scores indicate high perceived level of self-efficacy towards teaching thinking skills. A mean score between 1 and 2.33 means a low level of self-efficacy, a mean score between 2.34 and 3.66 means an average level of self-efficacy and a mean score between 3.67 and 5.00 means a high level of self-efficacy (see Table 3.4).

Table 3.3
Items Associated with each dimensions on the self-efficacy Survey

Dimensions	Item Number
Creating a Classroom Fit to Think	1, 2, 3, 4, 6, 7, 8, 9, 22
Teaching Higher Order Thinking Skills	10, 11, 17, 18, 19, 20, 21, 25
Teaching for Transfer	15, 16, 23, 24, 26
Recognise How Students Think	5, 12, 13, 14

Table 3.4

Level of self-efficacy towards teaching thinking based on total score and mean score

Total score	Mean score	Level
< 61	1 – 2.33	Low
61 – 96	2.34 – 3.66	Average
> 96	3.67 – 5.00	High

Section C – EMI: Critical thinking disposition Assessment

Section C of the questionnaire consists of 26 items that examined the level of critical thinking disposition of pre-service teachers. These items were adopted from EMI developed by Irani, et al. (2007).

Table 3.5

Items Associated with each dimensions on the EMI Survey

Dimensions	Item number
Engagement	2, 3, 5, 7, 8, 9, 14, 17, 18, 19, 22
Maturity	1, 11, 13, 16, 20, 24, 25, 26
Innovativeness	4, 6, 10, 12, 15, 21, 23

The items were categorised into three dimensions namely: Engagement, Maturity and Innovativeness (see Table 3.5). The pre-service teachers were required to respond to each item by circling a number on the questionnaire that employed a five-point Likert scale of agreement, that is 1 for “strongly disagree” – SD, 2 for “disagree” – D, 3 for “uncertain” – U, 4 for “agree” – A or 5 for “strongly agree” – SA. To calculate a total score for each participant, the scores of each item was added. The scores for 26 items were summed to give a total critical thinking disposition for each participant, with 130 representing the maximum score and 26 representing the

minimum score. The scores were also calculated for each dimension or subscale. High scores indicate high critical thinking disposition and low scores indicate low critical thinking disposition. A score below 61 means low level of critical thinking dispositions, a score between 61 and 96 means average level of critical thinking dispositions and a score above 96 means high level of critical thinking dispositions (see Table 3.6). A mean score between 1 and 2.33 means a low level of critical thinking dispositions, a mean score between 2.34 and 3.66 means a average level of critical thinking dispositions and a mean score between 3.67 and 5.00 means a high level of critical thinking dispositions (see Table 3.6).

Table 3.6
Level of critical thinking disposition based on total score and mean score

Total score	Mean score	Level
< 61	1 – 2.33	Low
61 – 96	2.34 – 3.66	Average
> 96	3.67 – 5.00	High

3.5 VALIDITY AND THE RELIABILITY OF THE INSTRUMENTS

The items for section B (Self-efficacy towards teaching thinking skills) of the instrument was taken from The New Millennium in Mind Survey which was developed by Tebb (2000). This section of the tool consists of 26 items measuring four dimensions namely Creating a Classroom Fit to Think, Teaching Higher Order Thinking Skills, Teaching for Transfer and Recognise How Students Think. To check the reliability and the internal consistency of The New Millennium in Mind Survey a pilot study was conducted on 198 participants by Tebb (2000) and it revealed Cronbach’s coefficient alpha reliability ranging from 0.83 to 0.93. The reliability of

the instrument was further confirmed in this study by finding Cronbach's alpha coefficient of internal consistency reliability for overall scale and subscales (see Table 3.7).

Table 3.7
Reliability of the items for subscales and overall scale of section B of the instrument

Dimensions	N	No. of items	Alpha Coeff.
Creating a Classroom Fit to Think	74	9	0.874
Teaching Higher Order Thinking Skills	74	8	0.867
Teaching for Transfer	74	5	0.809
Recognise How Students Think	74	4	0.752
Self-efficacy towards teaching thinking skills (Overall)	74	26	0.951

The items for section C (Critical thinking disposition Assessment) of the instrument was taken from EMI developed by Irani, et al. (2007). This section of the tool consists of 26 items measuring three dimensions namely Engagement, Maturity and Innovativeness. The EMI revealed an overall Cronbach's coefficient alpha reliability of 0.937 (Irani, et al., 2007). Similarly to section B the reliability of the instrument was further confirmed in this study by finding Cronbach's alpha coefficient of internal consistency reliability for overall scale and subscales (see Table 3.8).

Table 3.8
Reliability of the items for subscales and overall scale of section C of the instrument

Dimensions	N	No. of items	Alpha Coeff.
Engagement	74	11	0.917
Maturity	74	8	0.817
Innovativeness	74	7	0.843
Critical thinking disposition Assessment (Overall)	74	26	0.953

The Table 3.7 and Table 3.8 show the number of respondents, number of items and Cronbach's alpha coefficients for the subscales and overall scale. The Cronbach's alpha ranged from 0.752 to 0.953. Since the Cronbach's alpha coefficients in this study produced values greater than 0.7 the reliability of each scale was considered sound.

3.6 DATA COLLECTION

After appropriate communication with vice chancellor (see Appendix II) and the deans of the associated teacher education programs of MNU, all the potential participants were given the questionnaire along with all the important terminologies and a cover letter introducing the researcher and explaining with respect to the purpose of the survey (see Appendix I). As the study used the data from the whole population, all the pre-service teachers in their final semester of the teacher education programs it was distributed via the assigned supervisors. Altogether 77 questionnaires were distributed to the 3 teacher education programs and the return rate of the questionnaire was 96.1% with only 3 questionnaires not returned.

3.7 METHOD OF ANALYSIS

Data for this study were analyzed by using the Statistical Package for the Social Sciences (SPSS) version 17.0. The analysis included descriptive statistics, t-test, ANOVA, correlation and multiple regression analysis. The null hypotheses were tested at the alpha level of 0.05.

In order to answer the first two research questions which were to find the level of self-efficacy with respect to the teaching of thinking skills and the critical thinking disposition profiles of the pre-service teachers, frequency, percentage, mean and

standard deviation were computed. Each item in each of the subscale of the survey was analysed to determine the percentage of the participants who selected each of the possible response was computed. The participants' responses for each of subscale and overall scale in self-efficacy towards teaching thinking skills was recorded and a mean score was also computed for each subscale and for the overall scale along with the mean and standard deviation of the responses. Similarly the participants' responses for each of subscale and overall scale in critical thinking disposition was recorded and a mean score was also computed for each subscale and for the overall scale along with the mean and standard deviation of the responses. The level of self-efficacy of pre-service teachers towards teaching thinking skills as low, average or high was identified. Similarly the profile of critical thinking disposition of an average pre-service teacher was found which showed the level of critical thinking disposition among the pre-service teachers.

In order to answer the third and fifth research questions which were to find out if there were any significant difference between means of pre-service teachers' self-efficacy score and their critical thinking disposition and demographic variables of the pre-service teachers, the independent two tailed t-test and one way ANOVA was used respectively. For the demographic variable gender and age of the pre-service teachers, t-test was used while for GPA and the teacher education program of the pre-service teachers, ANOVA was used. A number of analysis was conducted to justify the assumptions made to use ANOVA and t-test that is to check for the normality and homogeneity of variance of the data.

In order to answer the fourth and sixth research questions which were to find out if there were any significant relationship between subscales of pre-service teachers'



self-efficacy score and their critical thinking disposition and demographic variables of the pre-service teachers, a multiple regression analysis was conducted.

Finally to answer the seventh research question that is to find out if there is any relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among the pre-service teachers, a Pearson correlation coefficient was calculated. The correlation was calculated between subscales and overall scales of self-efficacy and critical thinking disposition.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter presents the results of the data collected from 74 pre-service teachers of Maldivian National University (MNU). The chapter presents the demography of the respondents, followed by the statistical analyses required to answer the research questions and address the null hypothesis mentioned in Chapter One of this study.

The chapter consists of six sections which discuss the results for the seven research questions in the following order.

- Section 1: the background information about the participants of the study which includes gender, age, GPA and the teacher education program.
- Section 2: the level of pre-service teachers' self-efficacy towards teaching thinking skills (RQ1).
- Section 3: the profile of critical thinking dispositions of the pre-service teachers (RQ2).
- Section 4: the existence of relationship between the pre-service teachers' self-efficacy towards teaching thinking skills and their demographical variables (RQ3 & 4).
- Section 5: hypotheses testing significant differences and relationship that exists between the pre-service teachers' critical thinking disposition and their demographical variables (RQ5 & 6).

Section 6: the relationship between self-efficacy towards teaching thinking skills and critical thinking disposition (RQ7).

4.2 SECTION 1: PRE-SERVICE TEACHERS' DEMOGRAPHIC BACKGROUND

This section presents the respondents' demographic background information which includes pre-service teachers' gender, age, GPA and the teacher education program.

Table 4.1
Demographic Characteristics of pre-service teachers

		N	%
Gender	Female	56	75.7
	Male	18	24.3
Age	< 25 years	46	62.2
	≥ 25 years	28	37.8
GPA	< 2.0	4	5.4
	2.0 – 3.0	53	71.6
	> 3.0	17	23.0
Teacher Education Program	BATEFL	23	31.1
	BTI	10	13.5
	BTS	41	55.4

A total number of 74 pre-service teachers participated in this study of which 24.3% (N = 18) were males and 75.7% (N = 56) were females ranging in age from 20 to 43 (see Table 4.1). The frequency distribution of age shows 62.2% (N = 46) of pre-service teachers were below 25 years and 37.8% (N = 28) of the pre-service teachers were 25 years or above (see Table 4.1). The frequency distribution of GPA shows 5.4% (N = 4) of the respondents had a GPA score below 2.0, 71.6% (N = 53) of the respondents had a GPA score between 2.0– 3.0 and 23% (N = 17) of the respondents

had a score above 3.0. Out of the 74 pre-service teachers 31.1% (N = 23) were enrolled in Bachelor of Arts in Teaching English as a Foreign Language (BATEFL) programme, 13.5% (N = 10) were enrolled in Bachelor of Teaching Islam (BTI) programme and 53.4% (N = 41) were enrolled in Bachelor of Teaching Secondary (BTS) programme (see Table 4.1).

4.3 SECTION 2: PRE-SERVICE TEACHERS' SELF-EFFICACY TOWARDS TEACHING THINKING SKILLS

This section addresses the first research question that is the pre-service teachers' self-efficacy towards teaching thinking skills. A five-point Likert scale of confidence was used to find the self-efficacy towards teaching thinking skills in four different domains. Each response was assigned a numeric value from 1 to 5 respectively with 1 associated with "no confidence", 2 for "little bit confidence", 3 for "moderately confident", 4 for "very confident" and 5 for been "fully confident". This section is divided into five different sections with the headings: Pre-service teachers' self-efficacy in (1) Creating a Classroom Fit to Think, (2) Teaching Higher Order Thinking Skills, (3) Teaching for Transfer, (4) Recognising How Students Think and (5) teaching thinking skills.

4.3.1 Pre-service teachers' self-efficacy in Creating a Classroom Fit to Think

The self-efficacy in Creating a Classroom Fit to Think was addressed by nine different items (see Table 4.2).

Table 4.2
Pre-service teachers' self-efficacy in Creating a Classroom Fit to Think

Item no.	Self-efficacy in Creating a Classroom Fit to Think	NC ($\frac{\%}{n}$)	LC ($\frac{\%}{n}$)	MC ($\frac{\%}{n}$)	VC ($\frac{\%}{n}$)	FC ($\frac{\%}{n}$)	Mean score (\bar{x})
1	How confident are you with respect to your ability to allow students time to develop creative ideas as solutions to problems relating to life?	0 0	12.2 9	51.4 38	27.0 20	9.5 7	3.34
2	How confident are you with respect to your ability to plan lessons or projects that give students time to think?	0 0	4.1 3	35.1 26	43.2 32	17.6 13	3.74
3	How confident are you with respect to your ability to incorporate thinking skills into a variety of subject areas (e.g.math, social science, reading,etc..)?	1.4 1	13.5 10	33.8 25	40.5 30	10.8 8	3.46
4	How confident are you with respect to your ability to apply methods that teach thinking in the classroom?	1.4 1	5.4 4	35.1 26	43.2 32	14.9 11	3.65
5	How confident are you with respect to your ability to prompt the development of analogies between lessons learned in the classroom and reality?	0 0	14.9 11	24.3 18	48.6 36	12.2 9	3.58
6	How confident are you with respect to your ability to demonstrate or convey to students the importance of thinking skills in real-life situations?	0 0	10.8 8	25.7 19	50.0 37	13.5 10	3.66
7	How confident are you with respect to your ability to help students to apply their thinking skills outside the context of academic domains?	0 0	16.2 12	28.4 21	39.2 29	16.2 12	3.55
8	How confident are you with respect to your ability to teach Thinking skills using material devised by yourself?	0 0	12.2 9	45.9 34	35.1 26	6.8 5	3.36
9	How confident are you with respect to your ability to provide opportunities for students to use thinking skills to develop solutions to problems relating to life?	1.4 1	9.5 7	32.4 24	43.2 32	13.5 10	3.58
Mean (\bar{X})		0.5	11.0	34.7	41.1	12.8	3.55

Key	NC	-	no confidence	(score 1)
	LC	-	little bit of confidence	(score 2)
	MC	-	moderately confident	(score 3)
	VC	-	very confident	(score 4)
	FC	-	fully confident	(score 5)

Table 4.2 shows that only 1.4% ($n=1$) of pre-service teachers did not have confidence at all in incorporating thinking skills into a variety of subject areas as stated in item number 3, applying methods that teach thinking in the classroom as stated in item number 4 and providing opportunities for students to use thinking skills to develop solutions to problems relating to life as stated in item number 9. On average the pre-service teachers had most high confidence level ($\bar{x} = 3.74$) in planning lessons or projects that give students time to think as stated in item number 2 and least confidence level ($\bar{x} = 3.34$) in allowing students time to develop creative ideas as solutions to problems relating to life as stated in item number 1.

4.3.2 Pre-service teachers' self-efficacy in Teaching Higher Order Thinking Skills

The self-efficacy in Teaching Higher Order Thinking Skills was addressed by eight different questions (see Table 4.3). There were few pre-service teachers who were not confident at all in defining for students what higher order thinking actually is as stated in item number 3, defining for students various components of higher order thinking as stated in item number 4, providing strategies for students that enable them to use higher order thinking as stated in item number 5 and providing examples of great minds as stated in item number 8. On average the pre-service teachers had most high confidence level ($\bar{x} = 3.70$) in providing classroom activities that demand higher order thinking from students as stated in item number 7 and least confidence level ($\bar{x} = 3.28$) in providing examples of great minds as stated in item number 8.

Table 4.3
Pre-service teachers' self-efficacy in Teaching Higher Order Thinking Skills

Item no.	Self-efficacy in Teaching Higher Order Thinking Skills	NC ($\frac{\%}{n}$)	LC ($\frac{\%}{n}$)	MC ($\frac{\%}{n}$)	VC ($\frac{\%}{n}$)	FC ($\frac{\%}{n}$)	Mean score (\bar{x})
1	How confident are you with respect to your ability to provide thinking skill instruction in the classroom?	0 0	12.2 9	39.2 29	40.5 30	8.1 6	3.45
2	How confident are you with respect to your ability to provide time for students to practice higher order thinking strategies in the classroom?	0 0	10.8 8	40.5 30	36.5 27	12.2 9	3.50
3	How confident are you with respect to your ability to define for students what higher order thinking actually is?	1.4 1	16.2 12	32.4 24	40.5 30	9.5 7	3.41
4	How confident are you with respect to your ability to define for students various components of higher order thinking?	2.7 2	12.2 9	39.2 29	37.8 28	8.1 6	3.36
5	How confident are you with respect to your ability to provide strategies for students that enable them to use higher order thinking?	1.4 1	12.2 9	44.6 33	32.4 24	9.5 7	3.36
6	How confident are you with respect to your ability to provide feedback to students that enables them to evaluate their own and other's use of higher order thinking?	0 0	8.1 6	35.1 26	39.2 29	17.6 13	3.66
7	How confident are you with respect to your ability to provide classroom activities that demand higher order thinking from students?	0 0	5.4 4	36.5 27	40.5 30	17.6 13	3.70
8	How confident are you with respect to your ability to provide examples of great minds (e.g. biographical material of scientists, artists, musicians etc...)?	4.1 3	13.5 10	41.9 31	31.1 23	9.5 7	3.28
Mean (\bar{X})		1.2	11.3	38.7	37.3	11.5	3.47

4.3.3 Pre-service teachers' self-efficacy in Teaching for Transfer

The self-efficacy in Teaching for Transfer was addressed by five different questions (see Table 4.4). There were few pre-service teachers who were not confident at all in providing higher order thinking lessons/projects that cause students to connect regular

content areas as stated in item number 3, providing higher order thinking lessons/projects that cause students to connect regular content areas with social issues as stated in item number 4 and providing opportunities for students to rehearse thinking skills in simulated action relating to life as stated in item number 5. On average the pre-service teachers had most high confidence level ($\bar{x} = 3.65$) in creating opportunities for students to apply thinking skills socially as stated in item number 1 and least confidence level ($\bar{x} = 3.27$) in providing opportunities for students to rehearse thinking skills in simulated action relating to life as stated in item number 5.

Table 4.4
Pre-service teachers' self-efficacy in Teaching for Transfer

Item no.	Self-efficacy in Teaching for Transfer	NC ($\frac{\%}{n}$)	LC ($\frac{\%}{n}$)	MC ($\frac{\%}{n}$)	VC ($\frac{\%}{n}$)	FC ($\frac{\%}{n}$)	Mean score (\bar{x})
1	How confident are you with respect to your ability to create opportunities for students to apply thinking skills socially (e.g., school/ community interaction)?	0 0	5.4 4	39.2 29	40.5 30	14.9 11	3.65
2	How confident are you with respect to your ability to provide examples to show students how thinking skills are relevant in the context of life-skills?	0 0	6.8 5	44.6 33	35.1 26	13.5 10	3.55
3	How confident are you with respect to your ability to provide higher order thinking lessons/projects that cause students to connect regular content areas (e.g. math/research with substance abuse)?	1.4 1	6.8 5	45.9 34	37.8 28	8.1 6	3.45
4	How confident are you with respect to your ability to provide higher order thinking lessons/projects that cause students to connect regular content areas (e.g. social science) with social issues e.g. ethnicity?	1.4 1	14.9 11	39.2 29	37.8 28	6.8 5	3.34
5	How confident are you with respect to your ability to provide opportunities for students to rehearse thinking skills in simulated action relating to life?	1.4 1	18.9 14	41.9 31	27.0 20	10.8 8	3.27
	Mean (\bar{X})	0.8	10.6	42.2	35.6	10.8	3.45

4.3.4 Pre-service teachers' self-efficacy in Recognizing How Students Think

The self-efficacy in recognizing how students think was addressed by five different questions (see Table 4.5). There were 1.4% ($n = 1$) pre-service teacher who were not confident at all in determining cognitive skills prerequisite for mastery of a subject matter as stated in item number 1. On average the pre-service teachers had most high confidence level ($\bar{x} = 3.69$) in recognizing different learning styles in students as stated in item number 4 and least confidence level ($\bar{x} = 3.24$) in recognizing what constitutes cognitive deficiency in students as stated in item number 3. There was no student who was fully confident in recognizing what constitutes cognitive thinking abilities in students as stated in item number 2.

Table 4.5
Pre-service teachers' self-efficacy in Recognizing How Students Think

Item no.	Self-efficacy in recognizing how students think	NC ($\frac{\%}{n}$)	LC ($\frac{\%}{n}$)	MC ($\frac{\%}{n}$)	VC ($\frac{\%}{n}$)	FC ($\frac{\%}{n}$)	Mean Score (\bar{X})
1	How confident are you with respect to your ability to determine cognitive skills prerequisite for mastery of a subject matter?	1.4 1	10.8 8	43.2 32	36.5 27	8.1 6	3.39
2	How confident are you with respect to your ability to recognize what constitutes cognitive thinking abilities in students?	0 0	8.1 6	44.6 33	47.3 35	0 0	3.39
3	How confident are you with respect to your ability to recognize what constitutes cognitive deficiency in students?	0 0	13.5 10	51.4 38	32.4 24	2.7 2	3.24
4	How confident are you with respect to your ability to recognize different learning styles in students?	0 0	6.8 5	29.7 22	51.4 38	12.2 9	3.69
Mean (\bar{X})		0.4	9.8	42.2	41.9	5.8	3.43

4.3.5 Pre-service teachers' level of self-efficacy towards teaching thinking skills

The self-efficacy towards teaching thinking skills' questionnaire consisted of four dimensions or subscales. Therefore self-efficacy towards teaching thinking skill scale consisted of twenty six questions which sought different ways a teacher would implement thinking skills in their students and recognize how their students think. Table 4.6 shows the criteria used to categorize the level of self-efficacy among the pre-service teachers in the subscales and in the overall scale. Table 4.7 shows mean and standard deviation of each subscale in self-efficacy towards teaching thinking skills scale and overall self-efficacy towards teaching thinking skills scale. Among the subscales the highest ($\bar{X} = 3.55$) level of self-efficacy were found in Creating a Classroom Fit to Think subscale and lowest ($\bar{X} = 3.43$) level of self-efficacy were found in Recognising How Students Think subscale.

Table 4.6
Level of self-efficacy towards teaching thinking skills

Mean	Level
1.00 – 2.33	Low
2.34 – 3.66	Average
3.67 – 5.00	High

The results show that the pre-service teachers have an average level of self-efficacy towards teaching thinking skills in all the subscales and thus the pre-service teachers have an average level of self-efficacy towards teaching thinking skills (see Table 4.7).

Table 4.7

Mean and standard deviation of subscale and overall self-efficacy level towards teaching thinking skills of pre-service teachers

Self-efficacy	N. of items	Composite score	Mean (\bar{X})	SD	Level of self-efficacy
Creating a Classroom Fit to Think	9	31.93	3.55	0.14	Average
Teaching Higher Order Thinking Skills	8	27.73	3.47	0.15	Average
Teaching for Transfer	5	17.26	3.45	0.15	Average
Recognise How Students Think	4	13.72	3.43	0.19	Average
Self-efficacy towards teaching thinking skills (Overall)	26	90.64	3.49	0.15	Average

4.4 SECTION 3: PRE-SERVICE TEACHERS' CRITICAL THINKING

DISPOSITION

This section addresses the second research question which inquires into the pre-service teachers' critical thinking disposition. A five-point Likert scale of agreement for each item was used to find the critical thinking disposition in three different domains. This section is divided into four different sections with the headings: (1) Pre-service teachers' critical thinking disposition – engagement, (2) Pre-service teachers' critical thinking disposition – maturity, (3) Pre-service teachers' critical thinking disposition – innovativeness and (4) Pre-service teachers' level of critical thinking disposition.

4.4.1 Pre-Service Teachers' critical thinking disposition – Engagement

The items checking for the inclination towards engagement disposition was addressed via eleven different statements (see Table 4.8). On average the pre-service teachers most highly agreed ($\bar{x} = 4.14$) to the statement to keep on working on things until s/he gets them right as stated in item number 11 and least agreed ($\bar{x} = 3.62$) to the

statements being a good problem solver as stated in item number 5 and presenting issues in a clear and precise manner as stated in item number 10.

Table 4.8
Pre-service teachers' critical thinking disposition - Engagement

Item no.	Engagement	SD ($\frac{\%}{n}$)	D ($\frac{\%}{n}$)	U ($\frac{\%}{n}$)	A ($\frac{\%}{n}$)	SA ($\frac{\%}{n}$)	Mean Score (\bar{X})
1	I look for opportunities to solve problems.	1.4 1	10.8 8	13.5 10	37.8 28	36.5 27	3.97
2	I am interested in many issues.	0 0	8.1 6	20.8 15	44.6 33	27.0 20	3.91
3	I am able to relate to a wide variety of issues.	0 0	6.8 5	25.7 19	47.3 35	20.3 15	3.81
4	I enjoy finding answers to challenging questions.	0 0	2.7 2	18.9 14	47.3 35	31.1 23	4.07
5	I am a good problem solver.	0 0	8.1 6	33.8 25	45.9 34	12.2 9	3.62
6	I am confident that I can reach a reasonable conclusion.	0 0	8.1 6	17.6 13	52.7 39	21.6 16	3.88
7	I am able to apply my knowledge to a wide variety of issues.	1.4 1	5.4 4	21.6 16	52.7 39	18.9 14	3.82
8	I am able to explain things clearly.	1.4 1	6.8 5	10.8 8	60.8 45	20.3 15	3.92
9	I ask good questions when trying to clarify a solution.	0 0	5.4 4	21.6 16	51.4 38	21.6 16	3.89
10	I present issues in a clear and precise manner.	1.4 1	6.8 5	31.1 23	50.0 37	10.8 8	3.62
11	I keep on working on things until I get them right.	0 0	6.8 5	10.8 8	44.6 33	37.8 28	4.14
Mean (\bar{X})		0.5	6.9	20.6	48.6	23.5	3.88

The Table 4.8 shows that on average 48.6% of the pre-service teachers agreed to all the statements in the engagement domain of critical thinking disposition and on average 23.5% of the pre-service teachers strongly agreed to all the statements in the engagement domain of critical thinking disposition. This means 72.1% of the pre-service teachers have fairly positive inclination towards engagement disposition while

27.9% of the pre-service teachers do not have fairly positive inclination towards engagement disposition.

4.4.2 Pre-Service Teachers' critical thinking disposition – Maturity

The items checking for the inclination towards maturity disposition was addressed via eight different statements (see Table 4.9). On average the pre-service teachers most highly agreed ($\bar{x} = 4.20$) to the statements listening carefully to the opinions of others even when there is disagreement as stated in item number 1 and to believe that most problems have more than one solution as stated in item number 8 and least agreed ($\bar{x} = 3.80$) to the statement trying to consider the facts without letting ones biases affect his/her decisions as stated in item number 3.

Table 4.9
Pre-service teachers' critical thinking disposition – Maturity

Item no.	Maturity	SD ($\frac{\%}{n}$)	D ($\frac{\%}{n}$)	U ($\frac{\%}{n}$)	A ($\frac{\%}{n}$)	SA ($\frac{\%}{n}$)	Mean Score (\bar{X})
1	I listen carefully to the opinions of others even when they disagree with me.	0 0	2.7 2	14.9 11	41.9 31	40.5 30	4.20
2	I am likely to change my opinion when I am given new information that conflicts with my current opinion.	2.7 2	2.7 2	24.3 18	47.3 35	23.0 17	3.85
3	I try to consider the facts without letting my biases affect my decisions.	0 0	5.4 4	24.3 18	55.4 41	14.9 11	3.80
4	I can get along with people who do not share my opinions.	1.4 1	8.1 6	13.5 10	44.6 33	32.4 24	3.99
5	I consider how my own biases affect my opinions.	0 0	5.4 4	23.0 17	55.4 41	16.2 12	3.82
6	I try to find multiple solutions to problems.	0 0	8.1 6	23.0 17	43.2 32	25.7 19	3.86
7	I ask many questions when making a decision.	0 0	8.1 6	13.5 10	45.9 34	32.4 24	4.03
8	I believe that most problems have more than one solution.	0 0	5.4 4	9.5 7	44.6 33	40.5 30	4.20
	Mean (\bar{X})	0.5	5.7	18.3	47.3	28.2	3.97

The Table 4.9 shows that on average 47.3% of the pre-service teachers agreed to all the statements in the maturity domain of critical thinking disposition and on average 28.2% of the pre-service teachers strongly agreed to all the statements in the maturity domain of critical thinking disposition. This means 75.5% of the pre-service teachers have fairly positive inclination towards maturity disposition while 24.5% of the pre-service teachers do not have fairly positive inclination towards maturity disposition.

4.4.3 Pre-Service Teachers' critical thinking disposition – Innovativeness

The items checking for the inclination towards innovativeness disposition was addressed via seven different statements (see Table 4.10). On average the pre-service teachers most highly agreed ($\bar{x} = 4.18$) to the statements enjoying learning about many topics as stated in item number 1 and least agreed ($\bar{x} = 3.84$) to the statement striving to be well informed as stated in item number 3.

The Table 4.10 shows that on average 41.9% of the pre-service teachers agreed to all the statements in the innovativeness domain of critical thinking disposition and on average 33.0% of the pre-service teachers strongly agreed to all the statements in the innovativeness domain of critical thinking disposition. This means 74.9% of the pre-service teachers have fairly positive inclination towards innovativeness disposition while 25.1% of the pre-service teachers do not have fairly positive inclination towards innovativeness disposition.

Table 4.10
Pre-service teachers' critical thinking disposition - Innovativeness

Item no.	Innovativeness	SD ($\frac{\%}{n}$)	D ($\frac{\%}{n}$)	U ($\frac{\%}{n}$)	A ($\frac{\%}{n}$)	SA ($\frac{\%}{n}$)	Mean Score (\bar{x})
1	I enjoy learning about many topics	0 0	1.4 1	21.6 16	35.1 26	41.9 31	4.18
2	I ask lots of questions in a learning environment.	0 0	8.1 6	21.6 16	44.6 33	25.7 19	3.88
3	I strive to be well informed.	0 0	8.1 6	21.6 16	48.6 36	21.6 16	3.84
4	I enjoy solving problems.	0 0	5.4 4	14.9 11	45.9 34	33.8 25	4.08
5	I enjoy learning even when I am not in school.	1.4 1	4.1 3	18.9 14	39.2 29	36.5 27	4.05
6	I search for the truth even when it makes me uncomfortable.	0 0	5.4 4	16.2 12	39.2 29	39.2 29	4.12
7	I will go out of my way to find the right answers to a problem.	1.4 1	9.5 7	16.2 12	40.5 30	32.4 24	3.93
Mean (\bar{X})		0.4	6.0	18.7	41.9	33.0	4.01

4.4.4 Pre-Service Teachers' level of critical thinking disposition

The critical thinking disposition questionnaire consisted of three dimensions or subscales. Critical thinking disposition scale consisted of twenty six questions which sought different strategies of thinking critically. Table 4.11 shows the criteria used to categorize the level of critical thinking disposition among the pre-service teachers in the subscales and the scale. Table 4.12 shows mean and standard deviation of each subscale in critical thinking disposition scale and overall critical thinking disposition scale. Among the subscales the highest ($\bar{X} = 4.01$) level of critical thinking disposition were found in innovativeness subscale and lowest ($\bar{X} = 3.88$) level of critical thinking disposition were found in engagement subscale.

Table 4.11
Level of critical thinking disposition

Mean	Level
1.00 – 2.33	Low
2.34 – 3.66	Average
3.67 – 5.00	High

The results show that the pre-service teachers have a quite high level of critical thinking disposition in all the subscales and thus the pre-service teachers have an overall high level of critical thinking disposition (see Table 4.12).

Table 4.12
Mean and standard deviation of subscale and overall critical thinking disposition level of the pre-service teachers

Disposition	N. of items	Composite score	Mean (\bar{X})	SD	Level of critical thinking disposition
Engagement	11	42.65	3.88	0.16	High
Maturity	8	31.76	3.97	0.16	High
Innovativeness	7	28.08	4.01	0.13	High
Critical thinking disposition level (Overall)	26	102.49	3.94	0.16	High

4.5 SECTION 4: DIFFERENCE BETWEEN PRE-SERVICE TEACHERS' SELF-EFFICACY TOWARDS TEACHING THINKING SKILLS AND DIFFERENT VARIABLES FROM DEMOGRAPHIC BACKGROUND

This section answers third research question which discusses the difference of means for pre-service teachers' self-efficacy towards teaching thinking skills between four demographic factors of pre-service teachers. The first two demographic factors, gender and age was analyzed using t-test while the remaining two demographic

factors, GPA and the type of teacher education program was analyzed using ANOVA. Furthermore a multiple regression analysis was conducted to find if there were any relationship between scales and demographic characteristics of pre-service teachers.

A normality test was conducted to determine if there were statistically significant differences between the variables' population and the normal distribution. To test for normality, the skewness and kurtosis of the data was found out. To check whether the degree of skewness is "significantly skewed" the numerical value of skewness is compared with twice the \pm Standard Error of skewness, if the skewness value falls within the range of minus twice the standard error of skewness to plus twice the Standard Error of skewness, the skewness is considered to be acceptable since it is not seriously violated. A similar numerical process is used to check if the kurtosis is significantly non normal (*Price, 2000*). Hence the normality of data was checked using these criteria. To examine the equality of variance, Levene's test for equality of variance was conducted.

The subject of this research were all the pre-service teachers in their final year of the three teacher education program namely Bachelor of Arts in Teaching English as a Foreign Language, Bachelor of Teaching Islam (Hon) and Bachelor of Teaching (Secondary) at Maldivian National University. In order to test for normality of data, the skewness, Standard Error of skewness, kurtosis and Standard Error of kurtosis for each subscale and overall scale was examined (see Table 4.13). The results showed that the skewness value falls within the range of minus twice the Standard Error of skewness to plus twice the Standard Error of skewness, and kurtosis values also falls within the range of minus twice the Standard Error of kurtosis to plus twice the Standard Error of kurtosis. Thus the assumption of normality is assumed. The equality of variance was examined using Levene's test for equality of variance. The Levene's

Test for homogeneity of variances shows that different groups have same variance among the pre-service teachers (see Table 4.14).

Table 4.13
Skewness and Kurtosis of the data

Scales	N. of items	Composite score	SD	Skewness	Kurtosis
Creating a Classroom Fit to Think	9	31.93	5.47	-0.189	-0.267
Teaching Higher Order Thinking Skills	8	27.73	5.04	-0.187	0.157
Teaching for Transfer	5	17.26	3.18	-0.060	0.724
Recognise How Students Think	4	13.72	2.26	-0.331	-0.368
Self-efficacy towards teaching thinking skills (Overall)	26	90.64	14.72	-0.204	-0.118

Std. Error of Skewness is 0.279 & Std. Error of Kurtosis is 0.552

Table 4.14
Levene's test of equality of variances

Scales	p values for equal variances assumed			
	Gender	Age	GPA	Teacher Education Program
Creating a Classroom Fit to Think	0.644	0.240	0.116	0.054
Teaching Higher Order Thinking Skills	0.612	0.832	0.568	0.300
Teaching for Transfer	0.182	0.812	0.449	0.613
Recognise How Students Think	0.375	0.390	0.784	0.810
Self-efficacy towards teaching thinking skills (Overall)	0.318	0.400	0.417	0.217

4.5.1 Test for difference in self-efficacy towards teaching thinking skills by gender

Two-tailed t-tests were conducted (see Table 4.15) for difference in self-efficacy towards teaching thinking in all subscales by gender.

Table 4.15

Two – tailed t - tests for self-efficacy towards teaching thinking scales by gender

Scales	Mean		Std. Deviation		df	t	p
	Male (n=18)	Female (n=56)	Male (n=18)	Female (n=56)			
Creating a Classroom Fit to Think	32.44	31.77	5.02	5.64	72	0.45	0.65
Teaching Higher Order Thinking Skills	27.61	27.77	4.37	5.28	72	-0.11	0.91
Teaching for Transfer	17.22	17.27	2.60	3.37	72	-0.05	0.96
Recognise How Students Think	13.44	13.80	2.15	2.31	72	-0.58	0.56
Self-efficacy towards teaching thinking skills (Overall)	90.72	90.61	12.08	15.57	72	0.03	0.98

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the self-efficacy towards teaching thinking among pre-service teachers in terms of their gender. This result is supported by the study conducted by Tebbs (2000) who also used the same tool, which showed that there were no significant differences between the gender and self-efficacy of teachers towards teaching thinking skills.

4.5.2 Test for difference in self-efficacy towards teaching thinking skills by age

Two-tailed t-tests were conducted (see Table 4.16) for difference in self-efficacy towards teaching thinking in all subscales by age.

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the self-efficacy towards teaching thinking among pre-service teachers in terms of their age.

This result is supported by the study conducted by Tebbs (2000) who also used the same tool, which showed that there were no significant differences between the age and self-efficacy of teachers towards teaching thinking skills.

Table 4.16
Two – tailed t - tests for self-efficacy towards teaching thinking scales by age

Scales	Mean		Std. Deviation		df	t	p
	< 25 (n=46)	≥ 25 (n=28)	< 25 (n=46)	≥ 25 (n=28)			
Creating a Classroom Fit to Think	31.61	32.46	5.93	4.69	72	-0.65	0.52
Teaching Higher Order Thinking Skills	28.15	27.04	5.17	4.84	72	0.92	0.36
Teaching for Transfer	17.61	16.68	3.30	2.93	72	1.23	0.23
Recognise How Students Think	13.59	13.93	2.37	2.09	72	-0.63	0.53
Self-efficacy towards teaching thinking skills (Overall)	90.96	90.11	15.83	12.94	72	0.24	0.81

4.5.3 Test for difference in self-efficacy towards teaching thinking skills by GPA

One way ANOVA was used to test for self-efficacy towards teaching thinking skills by GPA (see Table 4.17).

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the self-efficacy towards teaching thinking among pre-service teachers in terms of their GPA. This result is supported by the study conducted by Courtad (2009) which showed that there were no significant differences between the GPA and self-efficacy of teachers towards teaching thinking skills.

Table 4.17

One way ANOVA test for self-efficacy towards teaching thinking scales by GPA

Scales	GPA	N	Mean	SD	df	F	sig
Creating a Classroom Fit to Think	< 2.0	4	32.50	2.08	2,71	0.23	0.80
	2.0 – 3.0	53	31.66	5.45			
	> 3.0	17	32.65	6.20			
Teaching Higher Order Thinking Skills	< 2.0	4	27.50	3.32	2,71	0.41	0.67
	2.0 – 3.0	53	27.43	4.96			
	> 3.0	17	28.71	5.73			
Teaching for Transfer	< 2.0	4	16.75	2.22	2,71	0.52	0.60
	2.0 – 3.0	53	17.08	2.90			
	> 3.0	17	17.94	4.15			
Recognise How Students Think	< 2.0	4	14.75	2.06	2,71	0.50	0.61
	2.0 – 3.0	53	13.60	2.24			
	> 3.0	17	13.82	2.43			
Self-efficacy towards teaching thinking skills (Overall)	< 2.0	4	91.50	8.06	2,71	0.33	0.72
	2.0 – 3.0	53	89.77	14.30			
	> 3.0	17	93.12	17.40			

4.5.4 Test for difference in self-efficacy towards teaching thinking by type of teacher education program

One way ANOVA was used to test for self-efficacy towards teaching thinking skills by type of teacher education program (see Table 4.18).

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the self-efficacy towards teaching thinking among pre-service teachers in terms of their teacher education program.

Table 4.18

One way ANOVA test for self-efficacy towards teaching thinking scales by type of teacher education program (TEdP)

Scales	TEdP	N	Mean	SD	df	F	sig
Creating a Classroom Fit to Think	BATEFL	23	31.43	6.79	2,71	0.14	0.87
	BTI	10	32.10	5.88			
	BTS	41	32.17	4.62			
Teaching Higher Order Thinking Skills	BATEFL	23	28.57	5.67	2,71	2.11	0.13
	BTI	10	24.80	5.01			
	BTS	41	27.98	4.52			
Teaching for Transfer	BATEFL	23	17.61	3.34	2,71	1.25	0.29
	BTI	10	15.80	2.97			
	BTS	41	17.41	3.11			
Recognise How Students Think	BATEFL	23	13.91	2.57	2,71	0.19	0.83
	BTI	10	13.40	2.17			
	BTS	41	13.68	2.14			
Self-efficacy towards teaching thinking skills (Overall)	BATEFL	23	91.52	17.35	2,71	0.55	0.58
	BTI	10	86.10	14.11			
	BTS	41	91.24	13.38			

4.5.5 Relationship between self-efficacy towards teaching thinking skills and demographic variables

Multiple regression analyses were conducted, regressing each of the subscales against demographic characteristics, which is gender, age, GPA and teacher education program. Table 4.19 shows that none of the scales were significant.

The levels of significance of all the subscales and general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant relationship between the self-efficacy towards teaching thinking skills of pre-service teachers and GPA, age, gender and the type of teacher education program.

Table 4.19

Summary of Multiple Regression Analysis for self-efficacy towards teaching thinking skills

Subscales	R ²	Adj. R ²	df	F	Sig.
Creating a Classroom Fit to Think	0.013	-0.044	4,69	0.23	0.92
Teaching Higher Order Thinking Skills	0.021	-0.035	4,69	0.38	0.82
Teaching for Transfer	0.033	-0.023	4,69	0.59	0.67
Recognise How Students Think	0.014	-0.043	4,69	0.24	0.91
Self-efficacy towards teaching thinking skills (Overall)	0.006	-0.052	4,69	0.10	0.98

4.6 SECTION 5: DIFFERENCE BETWEEN PRE-SERVICE TEACHERS' CRITICAL THINKING DISPOSITION AND DIFFERENT VARIABLES FROM DEMOGRAPHIC BACKGROUND

This section answers the fourth research question on the difference of means for pre-service teachers' critical thinking dispositions between four demographic factors of pre-service teachers. The first two demographic factors, gender and age were analyzed using t-tests while the remaining two demographic factors, GPA and teacher education program were analyzed using ANOVA. Furthermore a multiple regression analysis was conducted to find if there were any relationship between scales of critical thinking disposition and the demographic variables.

In order to test for normality of data, the skewness, standard error of skewness, kurtosis and Standard Error of kurtosis for each subscale and overall scale was examined (see Table 4.20). The Levene's Test for homogeneity of variances shows that different groups have same variance among the pre-service teachers except for engagement among different groups of GPA and among their program of study and

also for overall scale of critical thinking disposition among their program of study (see Table 4.21).

Table 4.20
Skewness and Kurtosis of the data

Scales	N. of items	Composite score	SD	Skewness	Kurtosis
Engagement	11	42.65	6.96	-0.740	0.301
Maturity	8	31.76	4.50	-0.590	0.079
Innovativeness	7	28.08	4.46	-0.660	-0.071
Critical thinking disposition level (Overall)	26	102.49	15.17	-0.677	0.67

Std. Error of Skewness is 0.279 & Std. Error of Kurtosis is 0.552

Table 4.21
Levene's test of equality of variances

Scales	p values for equal variances assumed			
	Gender	Age	GPA	Teacher Education Program
Engagement	0.621	0.599	0.033	0.12
Maturity	0.179	0.895	0.337	0.15
Innovativeness	0.909	0.826	0.793	0.065
Critical thinking disposition level (Overall)	0.662	0.834	0.337	0.066

4.6.1 Test for difference in critical thinking disposition by gender

Two-tailed t-tests were conducted (see Table 4.22) for difference in critical thinking disposition in all subscales by gender.

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the critical

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant difference in the critical thinking disposition among pre-service teachers in terms of their age.

4.6.3 Test for difference in critical thinking disposition by GPA

One way ANOVA was used to test for critical thinking disposition by GPA (see Table 4.24).

Table 4.24
One way ANOVA test for critical thinking disposition scales by GPA

Scales	GPA	N	Mean	SD	df	F	sig
Engagement	< 2.0	4	43.75	6.34	2,71	0.06	0.94
	2.0 – 3.0	53	42.53	7.78			
	> 3.0	17	42.76	4.02			
Maturity	< 2.0	4	33.50	4.65	2,71	0.35	0.70
	2.0 – 3.0	53	31.57	4.81			
	> 3.0	17	31.94	3.56			
Innovativeness	< 2.0	4	28.50	4.65	2,71	0.03	0.97
	2.0 – 3.0	53	28.02	4.60			
	> 3.0	17	28.18	4.23			
Critical thinking disposition level (Overall)	< 2.0	4	105.75	15.52	2,71	0.11	0.90
	2.0 – 3.0	53	102.11	16.41			
	> 3.0	17	102.88	11.26			

The results show that the level of significance of all the subscales and the general scale were greater than the significance level of $p = 0.05$. Therefore the null

hypotheses were not rejected. Hence there is no significant difference in the critical thinking disposition among pre-service teachers in terms of their GPA. This result is supported by three different studies conducted by Stewart & Dempsey (2005), Emir (2009) and Cohen (2010), which showed that there were no significant differences between the GPA and critical thinking disposition.

4.6.4 Test for difference in critical thinking disposition by type of teacher education program

One way ANOVA was used to test for critical thinking disposition by type of teacher education program (see Table 4.25).

Table 4.25
One way ANOVA test for critical thinking disposition scales by type of teacher education program (TEdP)

Scales	TEdP	N	Mean	SD	df	F	sig
Engagement	BATEFL	23	43.30	8.43	2,71	6.52	0.00*
	BTI	10	35.80	6.53			
	BTS	41	43.95	5.10			
Maturity	BATEFL	23	31.74	5.49	2,71	6.04	0.00*
	BTI	10	27.60	3.89			
	BTS	41	32.78	3.42			
Innovativeness	BATEFL	23	28.22	5.04	2,71	6.06	0.00*
	BTI	10	23.90	4.72			
	BTS	41	29.02	3.46			
Critical thinking disposition level (Overall)	BATEFL	23	103.26	18.55	2,71	6.97	0.00*
	BTI	10	87.30	14.10			
	BTS	41	105.76	10.83			

* significant at $\alpha = 0.05$

The results show that the level of significant difference among different teacher education programs and in their engagement scale was ($F(2, 71) = 6.52, p = 0.00$), maturity scale was ($F(2, 71) = 6.04, p = 0.00$), innovativeness scale was ($F(2, 71) = 6.06, p = 0.00$) and in their overall critical thinking scale ($F(2, 71) = 6.97, p = 0.00$).

The mean values for pre-service teachers in all the scales of critical thinking disposition is highest among the pre-service teachers in Bachelor of Teaching Secondary program and lowest in Bachelor of Teaching Islam. A further analysis of post hoc analysis using Bonferroni test indicated that there is a statistically significant difference between the mean score of the pre-service teachers in Bachelor of Teaching Islam ($M = 35.80, SD = 6.53$) and the other two groups of pre-service teachers in Bachelor of Teaching Secondary program ($M = 43.95, SD = 5.10$) and Bachelor of Arts in Teaching English as a Foreign Language ($M = 43.30, SD = 8.43$). However, no significant difference was found between the mean score of the pre-service teachers in Bachelor of Teaching Secondary program and Bachelor of Arts in Teaching English as a Foreign Language. This result indicate that both the sets of pre-service teachers in Bachelor of Teaching Secondary and Bachelor of Arts in Teaching English as a Foreign Language are more inclined to think critically compared to the pre-service teachers in Bachelor of Teaching Islam. This could be due to several factors one being how the subject matter is being delivered to these pre-service teachers and the fact what is required of them at assessment level could also affect their engagement in critical thinking disposition.

The results show that there is a significant difference between the teacher education programs and in all the scales of critical thinking disposition. Therefore the null hypotheses were rejected. Hence there is significant difference in the critical thinking disposition among pre-service teachers in terms of their teacher education

program. This result is supported by Shin et al. (2006), which showed a statistical significant difference between students in the different programs and critical thinking disposition was reported.

4.6.5 Relationship between critical thinking disposition and demographic variables

Multiple regression analyses were conducted, regressing each of the subscales against demographic characteristics, which is gender, age, GPA and the type of teacher education program. Table 4.26 shows that none of the scales were significant.

The levels of significance of all the subscales and general scale were greater than the significance level of $p = 0.05$. Therefore the null hypotheses were not rejected. Hence there is no significant relationship between the critical thinking disposition of pre-service teachers and GPA, age, gender and the type of teacher education program.

Table 4.26
Summary of Multiple Regression Analysis for critical thinking disposition

Scales	R ²	Adj. R ²	df	F	Sig.
Engagement	0.026	-0.030	4,69	0.47	0.76
Maturity	0.053	-0.002	4,69	0.97	0.43
Innovativeness	0.051	-0.004	4,69	0.93	0.45
Critical thinking disposition level (Overall)	0.043	-0.012	4,69	0.78	0.54

4.7 SECTION 6: RELATIONSHIP BETWEEN SELF-EFFICACY TOWARDS TEACHING THINKING SKILLS AND CRITICAL THINKING DISPOSITION

A Pearson correlation was used to test whether a relationship exists between the scales of pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition. Table 4.27 shows that there is strong positive correlation between pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition at $r = 0.668$, $p = 0.000$. This indicates that the pre-service teachers' self-efficacy towards teaching thinking skills is influenced by their critical thinking disposition or vice versa.

Table 4.27
Correlation matrix for general pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition (n=74)

	Overall self-efficacy towards teaching thinking skills	Overall critical thinking disposition
Overall self-efficacy towards teaching thinking skills	1	0.668**
Overall critical thinking disposition	0.668*	1

***Correlation is significant at the 0.01 level (2-tailed)*

The results in Table 4.28 show that there is a positive correlation between all of the scales in self-efficacy towards teaching thinking skills and all of the scales in their critical thinking disposition ($p = 0.000$). This means pre-service teachers with high self-efficacy towards teaching thinking skills are more disposed to thinking critically or vice versa.

Table 4.28

Correlation matrix for self-efficacy towards teaching thinking skills and in critical thinking disposition (n=74)

	Teaching Higher Order Thinking Skills	Teaching for Transfer	Recognise How Students Think	Engagement	Maturity	Innovativeness
Creating a Classroom Fit to Think	0.789**	0.799**	0.788**	0.610**	0.634**	0.567**
Teaching Higher Order Thinking Skills		0.851**	0.753**	0.616**	0.592**	0.576**
Teaching for Transfer			0.746**	0.553**	0.558**	0.518**
Recognise How Students Think				0.599**	0.617**	0.516**
Engagement					0.836**	0.890**
Maturity						0.843**

** Correlation is significant at the 0.01 level (2-tailed).

Since the levels of significance of the subscales and general scale were lesser than the significance level of $p = 0.05$, the null hypotheses were rejected. Thus this study shows that there is a significant relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among pre-service teachers. This result is supported by Dyer & Roberts (2005), which showed a statistical significant correlation exists between self-efficacy and critical thinking disposition.

4.8 DISCUSSION

The Major findings of the study are discussed below:

Pre-service teachers' self-efficacy towards teaching thinking skills: In all of the domains discussed in the study the pre-service teachers at MNU have an average level

of self-efficacy towards teaching thinking skills. Among these the pre-service teachers were found to be least confident ($\bar{X} = 3.43$) in recognizing how students think. This is also in line with the study conducted by Baysal, et al. (2010), which found that the pre-service also had least confident in recognizing how students think. While the pre-service teachers were most confident ($\bar{X} = 3.55$) in Creating a Classroom Fit to Think. This means this is the task which pre-service teachers believe more strongly that they have the ability to do so. When it comes to recognising how students think one of the factors that could affect may be the experience of the pre-service teacher. This fact is supported by the research conducted by Rosnani & Suhailah (2003) which shows that experienced teachers performed better than the less experienced teachers in the possession of self-efficacy towards teaching thinking. Another reason could be that these pre-service teachers has not had enough knowledge in this area yet.

Pre-service teachers' critical thinking disposition: In all of the domains discussed in the study the pre-service teachers at MNU have a high level of critical thinking disposition. This shows that the pre-service teachers actually do have high inclination towards critical thinking but however the fact that these pre-service teachers have an average level of self-efficacy towards teaching thinking implies that they are not fully confident in teaching thinking skills. This could again be due to the lack of experience and not enough knowledge in the area of how to teach thinking skills.

Pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to gender: There is no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and in their critical thinking disposition with regard to their gender. This could be due to the fact that Maldives do not have gender bias in the education of the male and female

students (Baden & Green, 1994). This is similar to the studies conducted by Tebbs (2000) on self-efficacy towards teaching thinking skills of teachers, Thompson (2001), Ricketts (2003) and Cohen (2010) on critical thinking disposition also did not show any significant difference in terms of gender. However in contrast to this, the study conducted by Rosnani & Suhailah (2003) on Malaysian teachers showed significant difference on the level of self-efficacy in terms of gender.

Pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to age: There is no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to their age. This is also found in the research conducted by Tebbs (2000) on the self-efficacy towards teaching thinking skills of teachers. Similarly the studies conducted by Rudd, et al. (2000), Thompson (2001) Racchini (2007) and Cohen (2010) on critical thinking disposition also did not show any significant difference in terms of age. This could mean that these set of pre-service teachers even though they are at different ages does not necessarily mean that they have different levels of experience in the field of teaching.

Pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to GPA: There is no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to their GPA. This is also found in the research conducted by Courtad (2009) on the self-efficacy of pre-service teachers. Similarly the studies conducted by Stewart & Dempsey (2005), Emir (2009) and Cohen (2010), on critical thinking disposition also did not show any significant difference in terms of GPA. GPA shows how academically good or bad a person is does not necessarily mean that they feel less confident in teaching thinking skill and

they are less disposed to think critically. This is because the GPA or the academic score may be affected by various factors like a person not having studied for an exam or due to stress that s/he could not do the exam well. Thus GPA is not necessarily a measure of the skill or disposition one has especially if the exams are not oriented towards them.

Pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with regard to teacher education program: There is no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and the program the pre-service teachers are enrolled in while there was a significant difference in the pre-service teachers' critical thinking disposition and the program the pre-service teachers are enrolled in. The statistically significant difference was between the mean score of the pre-service teachers in Bachelor of Teaching Islam ($M = 35.80$, $SD = 6.53$) and the other two groups of pre-service teachers in Bachelor of Teaching Secondary ($M = 43.95$, $SD = 5.10$) program and Bachelor of Arts in Teaching English as a Foreign Language ($M = 43.30$, $SD = 8.43$). However, no significant difference was found between the mean score of the pre-service teachers in Bachelor of Teaching Secondary program and Bachelor of Arts in Teaching English as a Foreign Language. The pre-service teachers' in Bachelor of Teaching Islam program was found to have a lowest mean score in critical thinking disposition than the pre-service teachers in the other two teacher education programs. This means that the pre-service teachers in the Bachelor of Teaching Islam program are less disposed to think critically than those pre-service teachers in the other two programs. A similar pattern was also seen in the study conducted by Rosnani & Suhailah (2003) which showed that the Islamic religious teachers were lowest in their self-efficacy towards Teaching Higher Order Thinking Skills. This result also aligns

with the fact that the Bachelor of Teaching Secondary program and Bachelor of Arts in Teaching English as a Foreign Language program have a creative and critical thinking module in their programs while the Bachelor of Teaching Islam program does not have any such module. This may also be due to the way the courses in the Bachelor of Teaching Islam program is conducted at MNU though Islam emphasizes the use of these higher order thinking in our daily life.

Relationship between the domains in pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition and Demographic variables: There is no significant relationship between any of the domains in the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition with any of the demographic variables. This means that the demographic variables age, gender, GPA or teacher education program of the pre-service does not have a positive or a negative relationship with either the self-efficacy towards teaching thinking skills or with their critical thinking disposition that is none of their demographic variables affect their self-efficacy and their critical thinking disposition.

Relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among pre-service teachers: There is a positive correlation between the pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition. This implies that if pre-service teachers' self-efficacy towards teaching thinking skills is high their critical thinking disposition would also be high.

CHAPTER FIVE

SUMMARY, RECOMMENDATION, IMPLICATION, AND CONCLUSION

5.1 SUMMARY

The purpose of this case study was to examine the self-efficacy towards teaching thinking skills and the critical thinking dispositions of pre-service teachers at the Maldivian National University. The following research questions were investigated:

1. What are the MNU pre-service teachers' level of self-efficacy with respect to the teaching of thinking skills?
2. What are the MNU pre-service teachers' profiles of critical thinking disposition?
3. Is there any significant difference in the self-efficacy towards teaching thinking skills among pre-service teachers in terms of their GPA, age, gender and the teacher education program?
4. Is there a significant relationship between the self-efficacy towards teaching thinking skills of pre-service teachers and the GPA, age, gender and the teacher education program?
5. Is there any significant difference in the critical thinking disposition among pre-service teachers in terms of their GPA, age, gender and the teacher education program?
6. Is there a significant relationship between the critical thinking dispositions of pre-service teachers and the GPA, age, gender and the teacher education program?

7. Is there any relationship between self-efficacy towards teaching thinking skills and critical thinking disposition among pre-service teachers?

The sample for this study comprised of seventy four out of a total of seventy seven pre-service teachers in their final semester of the teacher education programs conducted at MNU in the year 2012. Their self-efficacy towards teaching thinking skills were measured using a questionnaire adopted from Tebbs (2000) and their critical thinking disposition were measured using a questionnaire adopted from Irani, et al. (2007). The questionnaire included seven subscales namely Creating a Classroom Fit to Think, Teaching Higher Order Thinking Skills, Teaching for Transfer, Recognise How Students Think, Engagement, Maturity, Innovativeness and two overall scales which sought teachers' self-efficacy towards teaching thinking and their critical thinking disposition. In addition, relevant demographic data were obtained included gender, age, GPA and the type of teacher education program of the pre-service teachers. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0. The analysis included descriptive statistics, t-test, ANOVA, correlation and multiple regression analysis.

The overall finding of this research showed that the pre-service teachers have an average level of self-efficacy towards teaching thinking skills but a high level of critical thinking disposition. The pre-service teachers had the lowest self-efficacy in the subscale Recognizing How Students Think and highest in Creating a Classroom Fit to Think. The pre-service teachers' critical thinking disposition was lowest in Engagement subscale and highest in Innovativeness subscale. No significant difference and relationship was found between pre-service teachers' self-efficacy towards teaching thinking by gender, age, GPA and the type of teacher education program. Similarly no significant difference and relationship between critical thinking

disposition with regard to their gender, age or GPA were found. Though there was no significant difference in the pre-service teachers' self-efficacy towards teaching thinking skills and the program the pre-service teachers were enrolled in there was a significant difference in the pre-service teachers' critical thinking disposition and the program the pre-service teachers were enrolled in. The pre-service teachers' in Bachelor of Teaching Islam program was found to have a lower means score in critical thinking disposition than the pre-service teachers in the other two teacher education programs. This means the pre-service teachers in the Bachelor of Teaching Islam program are less disposed to think critically than the pre-service teachers in the other two programs though this shouldn't be the case since Islam highly emphasises the use of thinking. As pointed out by Rosnani & Suhailah (2003) it could be because the courses in the program may be taught in the traditional way where the teacher only talks and the students just take it and memorise them. Finally the results also showed an existence of a strong correlation between self-efficacy towards teaching thinking skills and critical thinking disposition. This means if one is highly confident in teaching thinking skills must be that the person is more prone to think critically and vice versa.

5.2 RECOMMENDATION

Since thinking skills are vital for the cognitive and ethical development of a person the teaching of these skills needs to be given great importance at all levels of education. This study can be useful in shaping curriculum design and delivery. The findings of this study could be used to by policy makers, teacher educators, and school administrators and by pre-service teachers themselves as will be elaborated. Furthermore this study could also be used to inform further research in the field of

self-efficacy towards teaching thinking skills and critical thinking skills in related fields.

The results of this study showed a positive correlation was found between self-efficacy towards teaching thinking skills and critical thinking disposition but however the level of self-efficacy of the pre-service teachers towards teaching thinking skills was at an average level while the critical thinking disposition level was at a high level. This implies that though these pre-service teachers are inclined to practice critical thinking skills themselves when it comes to teaching of these skills, there is some hesitation in doing so by number of the pre-service teachers. This may be due to various reasons, one of this maybe that the pre-service teachers do not have enough knowledge on thinking skills and how exactly it should be taught. The study conducted by Rosnani & Suhailah (2003) showed that the teachers were hesitant to carry out the teaching of thinking skills due to the fact that they lacked the knowledge and training in the field of teaching thinking skills. Another study conducted by Howard (2006) showed that pre-service teachers often teach the way they were taught. Therefore it is of vast importance that teacher education programs are embedded in with an ongoing course that promotes teaching of thinking skills or has a separate course which teaches thinking skills.

The policy makers and teacher educators have to take note of the fact that the research showed that the level of critical thinking disposition was lowest among the pre-service teachers enrolled in the Bachelor of Teaching Islam program. Thus in order to make the pre-service teachers skillful in teaching thinking skills the pre-service teachers should have the facilities of critical thinking at first in order to teach them to their students.

Moreover, various methods and techniques should be used, and the number of studies within this field should be increased to develop the critical thinking abilities and dispositions of the students attending the education faculties. The pre-service teachers who are supposed to teach the critical thinking abilities according to the curriculum designed by the Ministry of Education of Maldives should be presented with the information on how to teach these abilities, and should be gained adequacy on this issue. The pre-service teachers need to be made aware of the types of teaching thinking programs available and they should be trained in the various thinking program(s) like de Bono's lateral thinking program, Matthew Lipman's Philosophy for Children program or Reuven Feuerstein's Instrumental Enrichment program if not all at least one. But however it should not be forgotten that all these programs are from the West thus it would be wise if the Ministry of Education of Maldives comes up with a program that would be suitable to Maldives. Besides, various activities should also be used in order to make the students to use their critical thinking abilities in other fields as well as in the academic field.

Administrators should try to take steps to change newly hired teachers' negative attitudes toward teaching thinking skills into positive ones. First, regarding young teachers, administrators should provide in-service training program, organize workshops, and invite teachers to observe other teachers' successes, thus to make young teachers foster their confidence in teaching thinking skills. Second, for old teachers, administrators should provide technology and education related seminars, and training of educational technology to help them cope with the increasing use of new technology, thus to enhance their teaching efficacy. Training should not be about computer or technology alone but about how computer can help enhance teaching thinking skills.

5.3 IMPLICATIONS FOR FUTURE RESEARCH

This is a case study attempted to find out the self-efficacy towards teaching thinking skills and the critical thinking dispositions of pre-service teachers at the Maldivian National University only. While this study has a potential to contribute to a global body of knowledge, the application of this research is appropriate to inform the staff at this University about the critical thinking disposition and their self-efficacy towards teaching thinking skills of these students. It could also be used by policy makers of Maldivian government to inculcate thinking skills in students that graduate from schools. Several other studies could be conducted relating to this which could enable to find further aspects of these constructs. This research may be informative for researchers and theorists who seek to design future studies about critical thinking and self-efficacy towards teaching thinking skills. Future research may include additional qualitative studies or studies that seek to quantify the relationship between critical thinking and self-efficacy towards teaching thinking skills on various different populations in Maldives.

In addition to replication within a larger sample, it would be desirable to study self-efficacy in pre-service and in-service teachers and its relationship with observed levels in their student's achievement. Previous studies (Ashton & Webb, 1986) have shown student achievement and self-efficacy of teachers to be related. Studying changing levels of student achievement along with changing levels of efficacy might be one step in answering the question of which comes first. Another useful study would be to assess levels of efficacy of the pre-service teachers in the current study after some experience in a public school setting.



5.4 CONCLUSION

Critical thinking is an essential tool. Students must develop the ability to seek clarity, compare and contrast, and evaluate options. It is expected that the findings of this study would lead instructors and educators, especially in teacher education faculties but without being only specific to them, to incorporate critical thinking into their courses. In order to observe the real impact of the instruction, its implementation at different level and settings should be encouraged. Therefore, it is hoped that such studies would provide incentive to integrate thinking skills into existing educational programs or curricula or to design new courses peculiar to teaching thinking skills.

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APPENDIX I
COVER LETTER

Dear Participant,

My name is Fathimath Fareeda and I am a Masters degree student in Institute of education at the International Islamic University Malaysia. I am conducting a research study on self-efficacy towards teaching thinking skills and critical thinking disposition among the final year pre-service teachers in Maldivian National University.

Thank you for agreeing to complete a questionnaire as part of my research. Attached is a copy of the questionnaire I would be very grateful if you would complete and return it to me. It should take no longer than 20 – 30 minutes to complete.

Before you complete the enclosed questionnaire I wish to confirm that:

- The Dean has given permission for this research to be carried out.
- Your anonymity will be maintained and no comments will be ascribed to you by name in any written document or verbal presentation. Nor will any data be used from the questionnaire that might identify you to a third party.
- There is no right or wrong answer to any of the question.

Finally, I would like to thank you for taking the time to help me with my research. It really is much appreciated.

May Allah *Sub'hanahu wa Ta'ala* guide and give *hikmah* to those who have participated in this research and reward all those who are striving to serve Muslim *ummah*.

Yours sincerely

Fathimath Fareeda

IMPORTANT TERMINOLOGIES

Introduction

Before responding to the items in this survey, please consider the following:

Thinking skill is thought to comprise of four basic process (Cohen 1971).

- ❖ **Problem solving** (finding resolutions for a known or defined difficulty).
- ❖ **Decision-Making** ('weighing' the merits of several options and choosing the best).
- ❖ **Critical Thinking** (analyzing arguments and having insight into particular meanings and interpretations).
- ❖ **Creative-Thinking** (developing original, constructive thoughts, ideas, images).
- ❖ It is also thought to include sub-sets of essential skills, e.g **qualification** (finding unique characteristics), **classification** (determining common qualities), **relationships** (detecting regular operations), **transformations** (creation of new meanings), and **causation** (cause and effect, forecasting) (Pressisen, 1987).

The survey is divided into three equally important and complimentary sections. Completion of all sections are important. Typically, completion takes 20-30 minutes. All input is entirely confidential.

Your willingness to participate is greatly appreciated.

Thankyou.

QUESTIONNAIRE

Section A

Demographic Information

Gender:

Male

Female

Age: _____ yrs

Program of study: _____

GPA: _____

Section B

Self-efficacy towards teaching thinking

DIRECTIONS: Please circle the number that best describes your level of confidence

No Confidence	Little bit Confidence	Moderately Confident	Very Confident	Fully Confident
NC	LC	MC	VC	FC
1	2	3	4	5

#	How Confident Are you With Respect To Your Ability To:	NC	LC	MC	VC	FC
1	allow students time to develop creative ideas as solutions to problems relating to life?	1	2	3	4	5
2	plan lessons or projects that give students time to think?	1	2	3	4	5
3	incorporate thinking skills into a variety of subject areas (e.g.math, social science, reading,etc..)?	1	2	3	4	5
4	apply methods that teach thinking in the classroom?	1	2	3	4	5
5	determine cognitive skills prerequisite for mastery of a subject matter?	1	2	3	4	5
6	prompt the development of analogies between lessons learned in the classroom and reality?	1	2	3	4	5

#	How Confident Are you With Respect To Your Ability To:	NC	LC	MC	VC	FC
7	demonstrate or convey to students the importance of thinking skills in real-life situations?	1	2	3	4	5
8	help students to apply their thinking skills outside the context of academic domains?	1	2	3	4	5
9	teach Thinking skills using material devised by yourself?	1	2	3	4	5
10	provide thinking skill instruction in the classroom?	1	2	3	4	5
11	provide time for students to practice higher order thinking strategies in the classroom?	1	2	3	4	5
12	recognize what constitutes cognitive thinking abilities in students?	1	2	3	4	5
13	recognize what constitutes cognitive deficiency in students?	1	2	3	4	5
14	recognize different learning styles in students?	1	2	3	4	5
15	create opportunities for students to apply thinking skills socially (e.g., school/ community interaction)?	1	2	3	4	5
16	provide examples to show students how thinking skills are relevant in the context of life-skills?	1	2	3	4	5
17	define for students what higher order thinking actually is?	1	2	3	4	5
18	define for students various components of higher order thinking?	1	2	3	4	5
19	provide strategies for students that enable them to use higher order thinking?	1	2	3	4	5
20	provide feedback to students that enables them to evaluate their own and other's use of higher order thinking?	1	2	3	4	5
21	provide classroom activities that demand higher order thinking from students?	1	2	3	4	5
22	provide opportunities for students to use thinking skills to develop solutions to problems relating to life?	1	2	3	4	5

#	How Confident Are you With Respect To Your Ability To:	NC	LC	MC	VC	FC
23	provide higher order thinking lessons/projects that cause students to connect regular content areas (e.g. math/research with substance abuse)?	1	2	3	4	5
24	provide higher order thinking lessons/projects that cause students to connect regular content areas (e.g. social science) with social issues e.g. ethnicity?	1	2	3	4	5
25	provide examples of great minds (e.g. biographical material of scientists, artists, musicians etc...)?	1	2	3	4	5
26	provide opportunities for students to rehearse thinking skills in simulated action relating to life?	1	2	3	4	5

Section C

EMI: CRITICAL THINKING DISPOSITION ASSESSMENT

DIRECTIONS: Please indicate how much you agree or disagree with each numbered statement by circling the appropriate response.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
SD	D	U	A	SA
1	2	3	4	5

		SD	D	U	A	SA
1	I listen carefully to the opinions of others even when they disagree with me.	1	2	3	4	5
2	I look for opportunities to solve problems.	1	2	3	4	5
3	I am interested in many issues.	1	2	3	4	5
4	I enjoy learning about many topics	1	2	3	4	5
5	I am able to relate to a wide variety of issues.	1	2	3	4	5
6	I ask lots of questions in a learning environment.	1	2	3	4	5

		SD	D	U	A	SA
7	I enjoy finding answers to challenging questions.	1	2	3	4	5
8	I am a good problem solver.	1	2	3	4	5
9	I am confident that I can reach a reasonable conclusion.	1	2	3	4	5
10	I strive to be well informed.	1	2	3	4	5
11	I am likely to change my opinion when I am given new information that conflicts with my current opinion.	1	2	3	4	5
12	I enjoy solving problems.	1	2	3	4	5
13	I try to consider the facts without letting my biases affect my decisions.	1	2	3	4	5
14	I am able to apply my knowledge to a wide variety of issues.	1	2	3	4	5
15	I enjoy learning even when I am not in school.	1	2	3	4	5
16	I can get along with people who do not share my opinions.	1	2	3	4	5
17	I am able to explain things clearly.	1	2	3	4	5
18	I ask good questions when trying to clarify a solution.	1	2	3	4	5
19	I present issues in a clear and precise manner.	1	2	3	4	5
20	I consider how my own biases affect my opinions.	1	2	3	4	5
21	I search for the truth even when it makes me uncomfortable.	1	2	3	4	5
22	I keep on working on things until I get them right.	1	2	3	4	5
23	I will go out of my way to find the right answers to a problem.	1	2	3	4	5
24	I try to find multiple solutions to problems.	1	2	3	4	5
25	I ask many questions when making a decision.	1	2	3	4	5
26	I believe that most problems have more than one solution.	1	2	3	4	5

APPENDIX II

LETTER TO THE UNIVERSITY

Respected Chancellor,

My name is Fathimath Fareeda and I am a Masters degree student studying in the Institute of education at the International Islamic University Malaysia. I am conducting a research study on self-efficacy towards teaching thinking skills and critical thinking disposition among the pre-service teachers at the Maldivian National University.

It is assumed that, by the nature of professional training, pre-service teachers would implicitly have critical thinking skills and dispositions and that they naturally would employ critical thinking skills and dispositions in teaching and evaluating students. But so far no research has been carried out in this field in Maldives. Participation of pre-service teachers in this investigation will assist researcher in assessing if teacher education programs conducted at the MNU are accomplishing the goal of developing critical thinking among pre-service teachers.

Thus this letter is to request the participation of your final year Undergraduate pre-service teachers in the research study.

Thanking you for your cooperation.

Yours sincerely

Fathimath Fareeda

Pre-service teachers' self-efficacy towards teaching thinking skills and their critical thinking disposition : a case study in the Maldivian National University

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