

**Do Private Schools in Abu Dhabi UAE foster critical  
thinking as one of the main objectives of education?**

هل المدارس الخاصة في أبوظبي الإمارات العربية المتحدة تعزز  
التفكير النقدي باعتباره واحدا من الأهداف الرئيسية للتعليم؟

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## **Abstract**

Critical thinking is the process of determining the meaningfulness, accuracy, value of information and authenticity which raise the likelihood of reaching desired goals as recognized by the thinker. The aim of the present study is to identify and analyze the teaching methods and strategies used by teachers of private schools in Abu Dhabi UAE to enhance critical thinking skills among students. The current study adopted quantitative and cross sectional study design, where the study population targeted on both teachers and students (4<sup>th</sup> Graders, 5<sup>th</sup> Graders and University students) from an Al Najah Private School in Abu Dhabi UAE to identify how training was provided for teachers to foster critical thinking. In previous studies the importance of critical thinking with respect to private schools is lacking, thus the present study fills this gap by exploring the critical thinking among the students and teachers. The findings of this study explore the critical thinking pattern existing among the students and teachers. The teaching strategies followed by the teachers enhancing critical thinking skills among students. In addition, the teacher's teaching strategies and students learning methods has a positive relationship and teacher's teaching strategies increases students learning methods would likely to increase. The role of critical thinking skills in schools plays a major role in students learning methods. The study concluded that the teacher's critical thinking in schools is essential in education institutions.

## الملخص

التفكير النقدي هو عملية تحديد مغزى, دقة وقيمة المعلومات والأصالة التي ترفع من احتمالات الوصول إلى الأهداف المنشودة على النحو الذي يقره المفكر.

الهدف من هذه الدراسة هو تحديد وتحليل طرق التدريس والاستراتيجيات المستخدمة من قبل معلمي المدارس الخاصة في أبوظبي في الإمارات العربية المتحدة والتي تهدف إلى تعزيز مهارات التفكير الناقد لدى الطلبة.

اعتمدت الدراسة الحالية على حد سواء نظام الدراسة الكمي عبر قطاعات تصميم الدراسة، حيث استهدف مجتمع الدراسة علي كل من المعلمين والطلاب (الصف 4، 5 الصف وطلاب الجامعة) من مدرسة النجاح الخاصة في أبوظبي الإمارات العربية المتحدة لتحديد كيفية توفير التدريب للمعلمين لتعزيز التفكير النقدي.

في الدراسات السابقة على أهمية التفكير النقدي فيما يتعلق بالمدارس الخاصة هي غير موجودة، وبالتالي فإن الدراسة الحالية تملأ هذه الفجوة عن طريق استكشاف نسبة التفكير النقدي بين الطلاب والمعلمين.

النتائج التي توصلت إليها هذه الدراسة استكشاف نمط التفكير النقدي القائم بين الطلاب والمعلمين. استراتيجيات التدريس تليها المعلمين تعزيز مهارات التفكير الناقد لدى الطلبة.

بالإضافة إلى ذلك، أساليب استراتيجيات التدريس والطلاب تظهر مدى تأثير المعلم علاقة بإيجابية واستراتيجيات التدريس عند المعلم تزيد الطلاب بأساليب من المرجح بأنها تبعث بزيادة التعلم. إذ أن دور مهارات التفكير الناقد في المدارس تلعب دورا كبيرا في أساليب تعلم الطلاب.

وخلصت الدراسة إلى أن التفكير الناقد عند المعلم في المدارس أمر ضروري في مؤسسات التعليم.



## **Dedication**

**This work is dedicated to my family for their unconditional love and encouragement, my beloved wife Rita who greatly supported me to help me complete this dissertation, and whom I cannot have dreamt of a more perfect companion, my children Jean-Mark and Joya for encouraging me intangibly, and their patience with me in times of pressure, was inspirational and very much appreciated.**

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## CHAPTER I: INTRODUCTION

### 1.1 Research Background

The United Arab Emirates (UAE) includes seven Emirates (Bradshaw *et al.* (2004). UAE is located on the Gulf of Arabia of Saudi Arabia. UAE was typically ruled or administrated by appointed families set up at the formation of nation time and no political parties involved in UAE. In UAE, education system was established in 1950 and such system was developed specifically for schools. Primary education becomes mandatory in UAE. New formal schools were established in 1952. Moreover, the curriculum is strongly influenced by curricula in the Canada, United Kingdom, Canada, India and United States of America. In UAE, public schools are funded by the government and the curriculum was developed to match the development values and goals of UAE (Emirates, 2012). The instruction medium in the public schools is Arabic. Arabic is the first language and English as a second language. In UAE, there are also numerous private schools that are accredited internationally. Free education was provided by public schools whereas the fees will differ in private schools. Education reform concentrates on greater accountability, improved professionalism, better preparation and higher standards. Rote instruction was replaced with interactive learning forms as well as English medium education in order to link with other subjects like science and math. The Dubai Education Council (DEC), Abu Dhabi Education Council (ADEC) and Ministry of Education (UAE MOE) are tasked with reform of education that preserves cultural identity, local principles and traditions of the UAE.

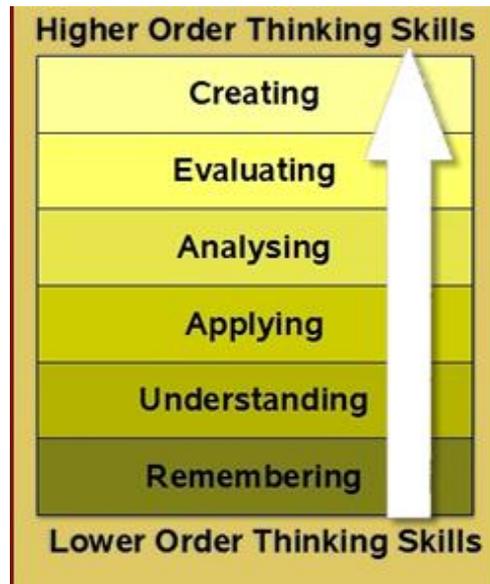
ADEC was established in 2005 by the Abu Dhabi's forward-thinking leader; His Highness Sheikh Khalifa Bin Zayed Al-Nahyan, the UAE President, the Supreme Commander of the Armed Forces and the Ruler of Abu Dhabi; who recognized education as the heart as dynamic, robust, progressive and competent society (Lunenburg, 2010). Abu Dhabi emirate started on an ambitious journey to reach its goal in the world as an emerging knowledge economy, established a strong framework for education which became instrumental for achieving the emirate's developing goals. ADEC is needed for elevating the education quality in Abu Dhabi (AD) to the highest standards, to ensure that all citizens have access to education to the provision of high quality. ADEC regulates, oversees and drives initiatives for development in all education sectors encompassing both private and public P-12 education as well as higher education. Given the differing needs and issues in each sector, ADEC established individual strategic plans which were based on research that function to reach the specific objectives of development of each sector. Such strategic plans were guided by Agenda of AD education policy with

main aim of transferring AD into innovation-based, diversified and knowledge-producing society (Macpherson *et al.*, 2007).

The objective of its existence is to develop a multi-layered and comprehensive education system that will be supporting lifelong learning in a various fields (ADEC, 2009). ADEC boosts all students for developing their skills, strengths and passions thus they will be contributing to the UAE development and will perform as active respondents in the world. In AD, public education sector has key priority to develop skilled and qualified nationals among students. Public schools in Abu Dhabi have been at the agenda of transformational reform center for elevating delivery of education and student performance to international standards. Such reform efforts span all education areas from the curriculum, teaching methods, physical resources and environment, and assessment of health and wellbeing. The reform effort in the public sector is driven by ADEC's ten years strategic plan that recognizes four main priorities such as enhancing access to P-12 education, elevating quality of school, providing affordable chances of high-quality education for private schools, concentrating on career development and national identity.

The public sector development will be integral to the overall Abu Dhabi's success in terms of economic and social goals (School Model, 2009). By educating students with strong abilities related to critical thinking which prepare them for higher education. Moreover, schools will support the development of human capital that is needed to achieve the Emirate's workforce demands. A new approach named "new school model" was developed for learning that overcome existing issues in the sector of public school for specific enhancements and driving tangible in delivery of education. Such model will act as a comprehensive foundation for student learning and moreover, it enables desired outcomes by developing main components of teaching quality, educational experience, parental involvement and school leadership. This model developed new teaching methods and new curriculum that is introduced for developing the student as a problem-solver and creative independent thinker. This model is developed for achieving these two core beliefs where students are fruitfully learning and the teacher will be responsible for productive useful learning of students. Some schools in UAE are failing to teach people to think critically and instead they are concentrating on learning by rote (UAE Academic, 2013). It is also recommended that critical thinking must be encouraged at school as well as home, as a thinking way that assists to solve problems, resolve conflicts and so on.

**Figure 1: Aspects of Critical Thinking Skills**

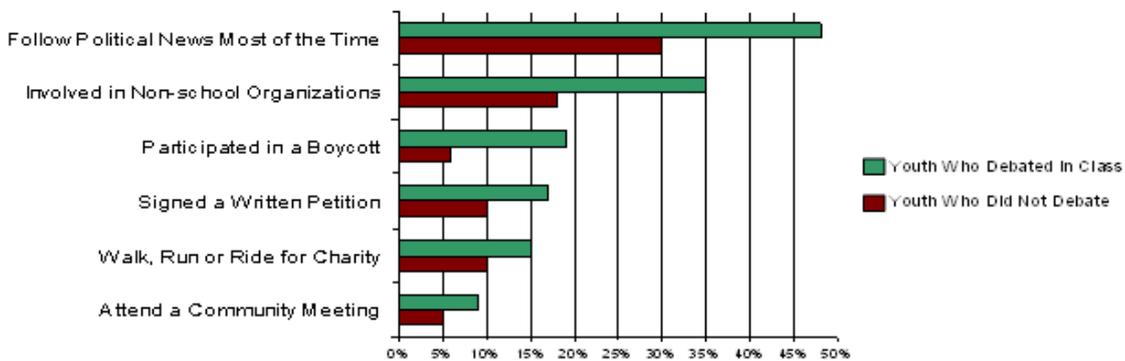


**Source: Critical Thinking**

Figure 1 illustrates the aspects of critical thinking skills. Higher order thinking skills are as follows: creating skills, evaluating skills, analyzing skills, applying skills, understanding skills and remembering skills. Lower order thinking skills are as follows: remembering skills, understanding skills, applying skills, analyzing skills, evaluating skills and creating skills (Critical Thinking).

93 per cent of higher education teachers believe that critical thinking skills are the significant outcome of learning (Quitadamo & Kurtz, 2007). It is also observed that critical thinking is needed for better learning outcome of students. It is also noticed that critical thinking is the second most essential skill after interpersonal skill. In schools, discussing and learning controversial issues will assist students to enhance critical thinking skills (Barton and McCuly, 2007). It is identified that students who regularly participate in the classroom, debate or discuss are likely to support basic values for democratic, vote in later life, follow political news in the media, take part in political discussions, also are interested in the life of politics and have confidence in their ability for influencing public policy. Learning regarding controversial topics in school raises political participation of students. Staff development and knowledge also plays a critical role in enhancing critical thinking.

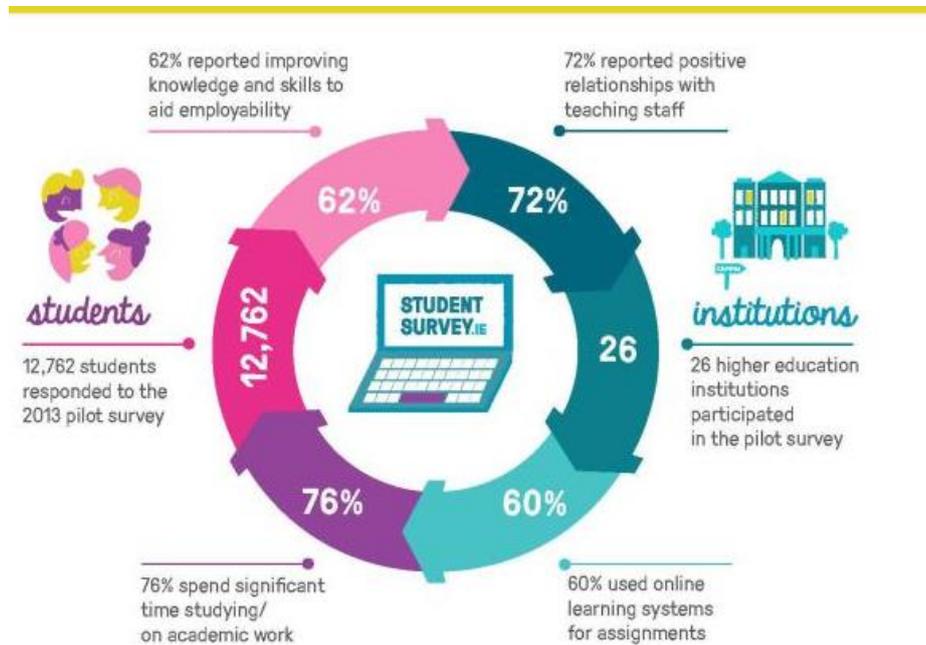
**Figure 2: Effects of Students who participate in Debate.**



**Source: Adopted from Andolina (2003)**

Figure 2 illustrates the effects of students who participate in Debate. Students who participate in debate will participate in a boycott, follow political news at the right time, run, walk or ride for charity, sign a written petition and attend a community meeting as well as enhancing critical thinking. Discussion and critical questioning will develop critical thinking skills of students and teach the students to believe that their thoughts and ideas are valued. Thus students will believe that students are only responsible for their own process of learning and progress (Andolina, 2003).

**Figure 3: Student’s Experience with Critical Thinking Skills.**



**Source: Adopted from Pilot Survey (2013)**

Figure 3 represents the student’s experience with critical thinking skills. This survey is carried out to gather information on engagement of students. This will provide an informed and valuable insight into experience of students of third-level education. Engagement of students with college life is essential to their overall key capabilities development like problem-solving skills, critical thinking skills, team work,

communication skills and writing skills. 60 per cent of the students reported enhancing skills and knowledge to aid employability. 72 per cent of the students reported positive relationship teaching staff that enhances the critical thinking skills. 76 per cent of the students spend significant time on studying or academic work. 60 per cent of the students used online learning systems for assignments. This also enhances critical thinking and intellectual skills. Good student feedback on satisfaction and engagement will be contributing to students experiencing on education which is responsive and relevant to their personal growth and development (Pilot Study, 2013). According to Techworkshop (2013) almost all curriculum designers, decision makers, educators insist on enhancing critical thinking skills among students.

**Table 1: Difference between Critical Thinkers and Uncritical Thinkers**

<b>Critical Thinkers</b>	<b>Uncritical Thinkers</b>
Have a <b>passionate</b> drive for clarity, precision, accuracy, relevance, consistency, logicalness, completeness, and fairness.	Often think in ways that are unclear, imprecise, inaccurate, etc.
Are <b>sensitive</b> to ways in which critical thinking can be skewed by egocentrism, sociocentrism, wishful thinking, etc.	Often fall prey to egocentrism, sociocentrism, wishful thinking, etc.
Are intellectually <b>honest</b> with themselves, acknowledging what they don't know and recognizing their limitations.	Pretend they know more than they do and ignore their limitations.
Listen <b>open-mindedly</b> to opposing points of view and <b>welcome criticisms</b> of beliefs and assumptions.	Are close-minded and resist criticisms of beliefs and assumptions.
Base their <b>beliefs on facts and evidence</b> rather than on personal preference or self-interest.	Often base their beliefs on mere personal preference or self interest.
Are <b>aware of the biases and preconceptions</b> that shape the way they perceive the world.	Lack awareness of their own biases and preconceptions.
<b>Think independently</b> and are not afraid to disagree with group opinion.	Tend to engage in 'group think', uncritically following the beliefs and values of the crowd.
Are able to <b>get to the heart of an issue or problem</b> , without being distracted by details.	Are easily distracted and lack the ability to zero in on the essence of a problem or issue.
Have the <b>intellectual courage</b> to face and assess fairly ideas that challenge even their most basic beliefs.	Fear and resist ideas that challenge their basic beliefs.
<b>Love truth</b> and <b>curious</b> about a wide range of issues.	Are often relatively indifferent to truth and lack of curiosity.
Have the <b>intellectual perseverance</b> to pursue insights or truths, despite obstacles or difficulties.	Tend to preserve when they encounter intellectual obstacles or difficulties.

**Source: Adopted from Techworkshop (2013)**

Table 1 illustrates the difference between critical thinkers and uncritical thinkers. Critical thinkers will be passionate towards precision, accuracy, clarity, logicalness, relevance, completeness, consistency and fairness whereas uncritical thinkers will not be precise, accurate, complete, clarity, relevant, logical, consistent and fair. Critical thinkers are sensitive to specific way in which critical thinking will be skewed by socio-centrism, egocentrism, and wishful thinking and so on whereas uncritical thinkers often fail to become wishful thinking, sociocentrism, egocentrism and so on. Critical thinkers will be intellectually honest with themselves, analyzing what they do not know and identifying their weakness and limitations whereas uncritical thinkers pretend that they know everything and neglect their weaknesses and limitations (Techworkshop, 2013).

Critical thinkers listen open-mindedly to speakers points of view and welcome criticisms related to assumptions and beliefs whereas uncritical thinkers are close-minded and resist criticisms of assumptions and beliefs (Techworkshop, 2013). Critical thinkers will base their beliefs on evidence and facts rather than believing self-interest or personal preference while uncritical thinkers often base their beliefs based on self-interest and personal preference rather than analyzing evidence and fact. Critical thinkers are aware of preconceptions and biases which shape the way they perceive the globe while uncritical thinkers lack awareness of their preconceptions and biases. Critical thinkers will think independently and they will not be afraid to disagree with group's thoughts and opinion whereas uncritical thinkers tend to participate and involve in the group opinion or think, uncritically they will be following the values and beliefs of the crowd. Critical thinkers have the ability to analyze the heart of a problem or an issue without being distracted by all details whereas uncritical thinkers will easily be distracted and lack the ability in analyzing the core or essence of an issue or a problem. Critical thinkers have the intellectual courage for facing and assessing fairly ideas that will be challenging for their most basic beliefs while uncritical thinkers will be afraid and resist ideas which challenge their basic beliefs. Critical thinkers are curios and want to know the truth about a wide range of problems or issues whereas uncritical thinkers lack curiosity and are indifferent to truth. Critical thinkers have the intellectual perseverance for pursuing truths or insights rather than difficulties or obstacles whereas uncritical thinkers tend to preserve when they face intellectual difficulties or obstacles.

**Table 2: Benefits of Critical Thinking**

<b>Critical thinking</b>	
<p><b>moves us away from:</b></p> <ul style="list-style-type: none"> <li>● rash conclusions</li> <li>● mystification</li> <li>● reluctance to question               <ul style="list-style-type: none"> <li>- received wisdom</li> <li>- authority</li> <li>- tradition</li> </ul> </li> </ul>	<p><b>moves us towards:</b></p> <ul style="list-style-type: none"> <li>● intellectual discipline</li> <li>● clear expression of ideas</li> <li>● acceptance of personal responsibility for our own thinking</li> </ul>

Source: Adopted from Educators Technology (2012)

Table 2 illustrates benefits of critical thinking. Critical thinking in education has many benefits. Critical thinking moves away from mystification, rash conclusion and reluctance to questioning such as authority, tradition and received wisdom. Moreover, critical thinking moves towards clear expressions of ideas, intellectual discipline and personal acceptance of responsibility of their own thinking. Critical thinking encompass taking the initiative to question what thinkers hear, read and observe, challenging the underlying ideas and assumptions of what thinkers are questioning, analyzing what question to be answered in a reasoned and unbiased way, remaining open to new perspectives and ideas (Educators Technology, 2012).

According to previous study, critical thinking helps to think deeply for making relevant connections, ask clarification and quality questions, analyze, reason and evaluate, use evidence and reasoning for supporting the thinking process, make reasoned decisions, synthesize diverse ideas, apply higher thought levels to the real-world situations, engage in reflective thinking, well-informed, seek new and better solutions, follow-problem-solving steps, assess consequences of ideas or actions, think critically on daily basis, respect and value ideas of others, explore alternatives, question the accuracy, credibility and relevancy of sources and information, generate and evaluate options before taking decisions, examine diverse view points; willing to consider various perspectives; assess consequences of ideas or actions, use criteria to judge the value of solutions and ideas, and think independently (Elder and Paul, 2006).

## **1.2 Problem Statement**

There have been various studies and researches that concentrate on critical thinking skills in educational institutions. There have been studies that examine the importance of critical thinking skills in schools (Paul and Elder, 2008). Researchers have studied the importance of teaching critical thinking skills for students (Scott, 2009; Hayes & Devitt, 2008). Moreover several studies also focused on critical thinking skills among school students (Duran & Sendag, 2012; Melhem & Isa, 2013). There is also study that focused on public schools in UAE fostering critical thinking as one of the main objectives of education (Thabet, 2008). However, there has been no specific study with respect to the importance of critical thinking with respect to private schools with reference to Abu Dhabi UAE. This study tries to bridge the gap by analyzing in detail whether private schools with specific reference in Abu Dhabi UAE are fostering critical thinking as one of the main objectives of education.

### **1.3 Motivation of the Study**

All educators, decision makers and curriculum makers insist on fostering critical thinking in school education. Critical thinking is essential in education since it helps to think deeply for making relevant connections, analyze, reason and evaluate, ask clarification and quality questions, make reasoned decisions, synthesize diverse ideas and use evidence and reasoning for supporting the thinking process. Uncritical thinkers cannot be able to solve the problems properly, will take rash conclusions and so on. Educational institutions in Abu Dhabi attempts to foster critical thinking skills as the main goal in education. This study is conducted to analyze the importance of critical thinking skills among students.

### **1.4 Aim of the study**

The main aim of this study is to identify whether the teaching methods and strategies used by teachers of private schools in Abu Dhabi in UAE foster critical thinking to enhance its skills among students.

### **1.5 Research Objectives**

- i. To identify the role of critical thinking skills in schools.
- ii. To determine teaching methods that is used by the teachers for enhancing critical thinking skills among students.
- iii. To analyze teaching strategies used by teachers for enhancing critical thinking skills among students.

### **1.6 Research Questions**

- i. Why critical thinking skills are needed in schools?
- ii. What teaching methods do teachers use for enhancing critical thinking skills among students?
- iii. What teaching strategies are used by teachers for enhancing critical thinking skills among students?

### **1.7 Research Limitations**

- i. This research is limited to Abu Dhabi UAE alone.
- ii. This study takes into consideration exclusively for the critical thinking in private schools.
- iii. The findings of this study are limited to the private schools.

- iv. This study is limited to educational institutions alone.

## 1.8 Outline of the Thesis

There are five main chapters in the present study.

- i. **Chapter 1 Introduction:** It encloses the introduction to the study, containing, aim, objectives, research background, significance and limitations of the study. Furthermore, this chapter has research questions and a problem statement.
- ii. **Chapter 2 Literature Review:** In this literature review section analysis the past studies on various researchers to critical thinking theories, critical thinking of educational institution, role of teachers in developing critical thinking and critical review on the studies on critical thinking among students in schools.
- iii. **Chapter 3 Research Methodology:** In this chapter reveals detailed research methodology includes data collection and analysis, sample frame and selection, sub-chapters related to study design and approach. , and.
- iv. **Chapter 4 Results and Discussion:** This chapter analyses a quantitative approach with the help of the questionnaire results, in regard to the study topic and questions through quantitative analysis. Furthermore this section developed the discussions from the results of the study.
- v. **Chapter 5 Conclusion and Recommendations:** This chapter consists of the conclusion obtained by connecting the proposed research objectives with facts inferred from the results. This chapter also has strategies and recommendations for future research. This research also entails bibliography including the sources that were used in collecting secondary data in the research and an appendix that has tools like questionnaires that were used in the gathering primary data for the research.

## CHAPTER II: LITERATURE REVIEW

### 2.1 Introduction

This chapter discusses in detail about definition of critical thinking theories such as Benjamin Bloom's theory, revised Benjamin Bloom's taxonomy and three-part theory of critical thinking, critical thinking of educational institution, why teach thinking encompass teach thinking strategies, role of teachers in developing critical thinking such as environment creating to develop critical thinking, discussion, questioning, types of critical questioning, problem-solving skills and teachers as a critical thinker, critical review on the studies on critical thinking among students in schools and finally concluded with chapter summary.

### 2.2 Definition of critical thinking theories:

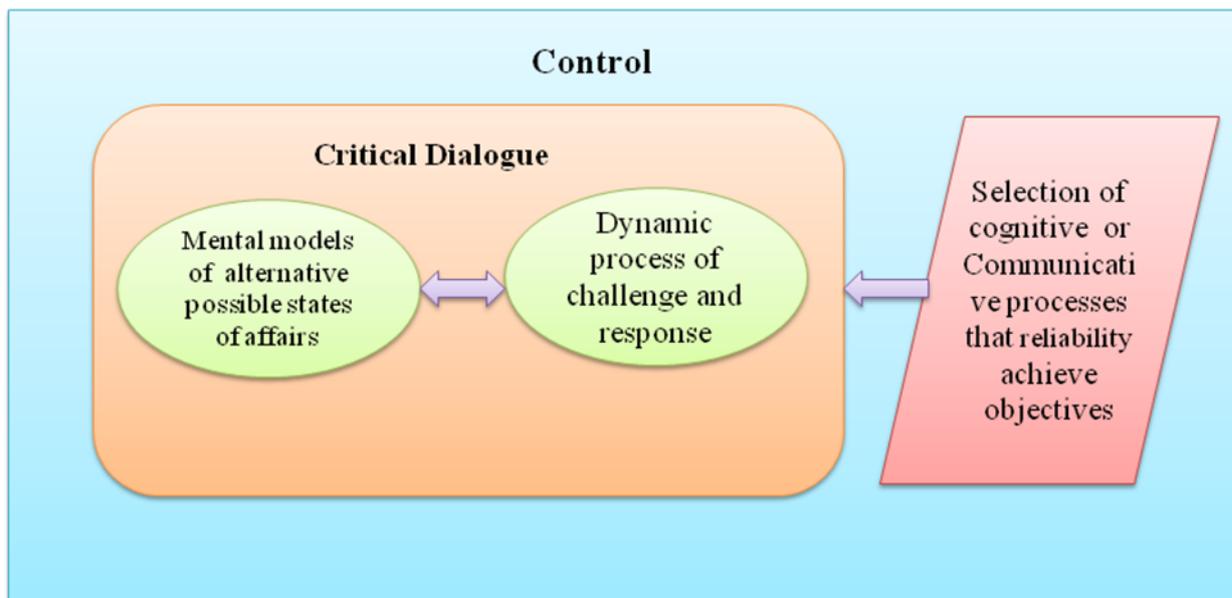
Theories related to critical thinking are discussed here as follows namely Benjamin Bloom's Taxonomy, revised Benjamin Bloom taxonomy and three-part theory of critical thinking.

#### 2.2.1 Benjamin Bloom's Taxonomy:

According to Richard (1995) Bloom's taxonomy influence educators in their critical thinking and teaching. Teachers use this taxonomy for designing their lessons, prepare assignments and test questions. In 1956, Benjamin Bloom was the first person to differentiate skills of human thinking into six classes such as knowledge, analysis, application, comprehension, synthesis and evaluation. Knowledge is all about remembering of before studied material. Knowledge represents the lowest learning level and their outcomes will be in a cognitive domain. In this level, students will be searching answer for these questions like what, who, how where and when. Knowledge is followed by comprehension. It is the potential to grasp the material meaning and goes just beyond. It considers what concept does individual has learned and explains it into their own words. Application is the capability to implement learned material in concrete and new ways. It requires higher understanding level than comprehension. This level learner's to change, apply, defend, translate, interpret and complete. In analysis, the outcomes of need an understanding of structural and content material form. Synthesis is the capability to put learned parts together to create a new one. Evaluation is the last taxonomy level. It is the ability to judge the material value for a particular purpose. In the cognitive hierarchy, learning outcomes will be highest since they include elements of comprehension, knowledge, analysis, application, synthesis, being able to command, assess, critique, conclude and support their findings (Fisher, 2001).

Bloom's taxonomy was revised by Anderson and Krathwohl (2001). The revised version of taxonomy encompasses remembering, understanding, analyzing, applying, evaluating and creating. Remembering includes recalling, recognizing and retrieving related knowledge from long-term memory, understanding encompass constructing meaning from written, graphic and oral messages through exemplifying, inferring, interpreting, classifying, comparing, summarizing and explaining. Applying carries out or use a procedure through implementing or executing, analyzing that breaks material into constituent parts, determines how the parts are related to each other and to an overall purpose or structure through organizing, differentiating and attributing. Evaluating makes judgments based on standards and criteria through critiquing and checking. Creating elements together to form a functional or coherent whole; reorganizes the elements into a new structure or pattern through planning, generating or producing.

**Figure 1: Three-Part Theory of Critical Thinking**



**Source: Adopted from Cohen (2000)**

Figure 1 illustrates the three-part theory of critical thinking. Critical thinking has a multi-layered structure. Theory is embedded in three layers such as metal models, critical dialogue and reliability control. Three layers are linked with distinctive performance criteria that function from internal to external in their attention. First layer is the innermost critical thinking includes selective part regarding alternative possible affairs state. At this level, performance metrics encompass explanatory, probabilistic and logical mental models coherence. At the medium level, under critical questioning layer, these models are embedded that boosts the evaluation and generation of possibilities. Such evaluation occurs within a single person or they are carried out among different peoples. By reference the critical

questioning are evaluated to norms in order to conduct the relevant critical dialogue type. These types are distinguished by the profound of probing to which a supporter or adviser must respond and allowed responses scope. At the outer layer, critical thinking judges the cognitive faculty's reliability, the trust degree which is included in its outputs. The critical dialogue may be social or cognitive processes that are involved to generate decisions and beliefs. Different processes like recognition of pattern are more reliable under certain situations (Cohen, 2000).

### **2.3 Critical Thinking of Educational Institution**

Critical thinking is very essential in education. The need for critical thinking in education field is as follows. Critical thinking is the ability to decide what to do or believe with a disposition in order to provide proof in support of one's conclusion or suggestion and to ask for proof from others before deciding answer from their suggestions. It is the process of identifying the meaningfulness, accuracy, value of information and authenticity which will raise the likelihood of reaching desired goals as recognized by the thinker. It is reasoned, purposeful and goal-directed. It is directed toward calculating probabilities, solving problems, making decision and deducing inferences. It helps to astute financial decisions, good career decisions and general life decisions (Critical thinking, 2012). Thus critical thinking in education field is important as helps to solve the problems as well as making decisions.

According to Kim (2003), Bailin (2002), Halpern (1999), Tapper (2004) and Phillips and Bond (2004) the critical thinking's importance in education is globally and widely acknowledged. Pescatore (2007) refer that adopting an approach of critical thinking in schools will be beneficial beyond the success of academic, particularly when students are allowed to analyze the problem and make decision on their own. Thus the critical thinking in educational institutions or school will be beneficiary for students. Elder and Paul (2009) describe that students who receive instruction of critical thinking can able to understand and make their decisions. Intellectual skills will be developed by these students that help them to understand how to behave with others. The education's goal is to form the citizens with emboldened and empowered to act as an outcome of their conscious awareness or understanding, so in an ethical framework, critical thinking must be taught (Pescatore, 2007). Thus the main aim of the critical thinking is to develop the individual's awareness regarding any kind of work.

According to Paul and Elder (2008) three activities are needed for the aim of improving critical thinking among all academic purposes. These are writing to learn, critical reading and classification games. Critical reading refers to draw inferences, evaluate and arrive at conclusions by considering the evidence, for example, television, newspaper, literature, radio, magazines and articles. When reading, the students can able to compare various ideas which help to develop a questioning attitude (Dunn, 2005).

McCollister and Saylor (2010) refer that incorporating writing in curriculum provide an opportunity for promoting critical thinking since it includes a process of thinking like composing ideas, retrieving information, participating in a ideas, world of things, people, events and explores personal connections to that globe. Hence, three activities are necessary for enhancing the critical thinking skills among students such as critical reading, classification games and writing to learn.

## **2.4 Why teach thinking**

Ritchhart and Perkins (2005) refer that the teaching critical thinking to students is essential since it enhances the academic achievement. Dunn (2005) describes that teaching critical thinking to students will be useful for the students to differentiate various views and ideas and characterize the process. Synder et al (2005) refer that critical thinking can be learned that requires practice and instruction. Teaching critical thinking is essential for students because by using instructional strategies they help students in the process of learning than depending on rote memorization and lecture. It focuses on instruction on learning process than depending on the content. Hou et al (2007) refer that it uses assessment techniques which enable students with an intellectual practice than memory recall. Critical thinking enables students' intellectual thinking, therefore teaching critical thinking in schools is necessary.

### **2.4.1 Teach thinking strategies**

Hou et al. (2007) refer that critical thinking teaching plays an important role in assisting individuals to develop the habits of self-assessment and self-analysis and enable students to broader their views and perspectives. Paul and Elder (2006) refer that for cultivating the intellect, intellectual skills have to be developed. Additionally mind tools help the thinker to think well by analyzing any issue or question through confusions and complexities, to include with competing opinions, viewpoints and other views. Therefore tools are necessary for critical thinking. According to Haves and Devitt (2008) four useful ways can be taught or included in the curriculum of the critical thinking such as including problem solving skills, asking or framing questions that need critical analysis, evaluating or analyzing sources and decision making.

According to Bruning et al (2004), the most effective teachers or instructors teach CTS in an orderly fashion and sequential. The practices of critical thinking will beneficiary all the students. It is recommended that extended practice and explicit instruction will be more influential when compared to aptitude. Moreover McCollister and Saylor (2010) point out that appropriately opportunities must be given to the students for enhancing their problem-solving and critical thinking skills. Practicing critical thinking show better result among les skilled students and they achieve higher achievement levels than

more intelligent students based on guided and continual critical thinking practice. Implementation of any program regarding critical thinking at the school level must be built in a way to develop the ability of analyze, assess, evaluate and make decisions (Bruning et al, 2004; Paul and Elder, 2006).

## **2.4.2 Role of teachers in developing critical thinking**

Qatami (2005) refer that critical thinking is importance concept in modern education. All teachers or educators are interested to teach critical thinking to their students. According to Scott (2009) it is the educators' or teachers duty to develop students with the knowledge and skills and provide strategies for critical thinking for solving problems. The main issue is how to change these significant instructional objectives into developmentally relevant activities that are incorporated into lessons across the syllabus or curriculum. These strategies and objectives implementation may seem to be tough, but need only a little attention to reach these goals. Teachers must provide opportunities for learners or students to find out the materials they are working with, characteristics must be analyzed and identify differences and similarities between them. Teachers also provide space and time for brainstorming and for testing and making of plans. Thus teachers play an important role in developing student's critical thinking skills (Hou et al, 2007).

### **2.4.2.1 Environment creating to developing critical thinking**

Ritchhart and Perkins (2005) and Qatami (2005) point out that the learning environment is needed to develop the critical thinking to stimulate student's interest, create meaningful discussion and foster a supportive and trusting atmosphere and exposure to ideas and views of others. Student's interest is important to grasp their attention and this can be reached with an approach namely problem-oriented or problem-related to learning. Once students are interested to learn, then they can be guided and supported to think critically as well as developing their confidence in their own potential for analyzing and solving problems. To maintain the students' interest, meaningful discussion is significant. Lerner (2003) refer that during meaningful discussion, questioning and debates must take place which helps students for building mental structures that is needed for critical thinking. Students must permit to express their viewpoints by realizing their own egocentric views and assumptions and learn for reason behind it from various perspectives. An atmosphere of support and trust is important to express their own ideas and for attempting new ways of thinking (Larsen, 2002). Thus learning environment is essential for students to develop their critical thinking skills.

#### **2.4.2.2 Discussion**

Anderson et al (2001) point out that, when students discuss or interact with others in meaningful and deep ways, the results or outcomes are produced beyond the dispositions and capabilities of the individual students. Students bring the discussion from different background experiences, cultural and social values, prior assumptions and knowledge. With the help of discussion or interactions, students try to incorporate many ways of critical thinking and behaving that enable the dispositions, skills and knowledge required to support transfer to other situations which need independent skills of problem solving. Thus critical thinking can be enhanced with the help of such interactions or discussions in the classroom.

Helterbran (2007) refer that the classroom discussions provide a setting for students' intellectual exploration that provide chances to basic knowledge, blend life experiences and practice the thinking skills. When students share cultural and social experiences they can able to make their own suggestion or conclusion by analyzing various views and perspectives.

#### **2.4.2.3 Questioning**

Ikuenobe (2001) refer that effective questioning is the most useful critical strategies which teachers use for promoting critical thinking. Good questions may guide thinking and boost students to analyze, interpret, critique, synthesize and reflect. Questioning has been accepted by the teachers as an inquiry's open-ended processes and critical thinking function. Teachers must develop the questioning skills to spontaneously ask questions, whether it helps to nourish the intelligence of students (Shaunessy, 2005). Hayes and Bailey (2003) refer that questioning techniques or asking the right questions to develop the Critical Thinking Skills (CTS) among students. Hemming (2000) state that integrating classroom discussions with questioning techniques might support the students to practice and demonstrate CTS. Brown and Kelley (2000) refer that when teachers use critical techniques of questioning that will help the students to learn CTS. Examples of questioning are what do you think about that, what does it show and presuppose, what explains it, leads from it, connects to it, what is your knowledge or opinion based upon, should it be viewed differently and how you are viewing it and so on. These questions were used to evaluate the accuracy and clarity of students' thinking. Thus effective critical questioning is essential for analyzing, interpreting, critiquing, synthesizing and reflecting the answers.

#### **2.4.2.4 Type of critical questioning**

Vo and Morris (2006) point out that types of questions that are used in critical thinking includes summary and definition questions, analysis questions and hypothesis questions. Examples of summary and definition questions are what, when, who, how many, how much, what is an example of and so on. Examples of analysis questions are how, what are the reasons for, why, what are the types of, what other examples of, what is the process of, what are the results/causes of, what is the relationship between, what are the conflicts or problems or issues, how does it can be applied to, what are the possible resolutions or solutions to these issues or conflicts or problems, what proof or evidence or support is offered, what is the main thesis or argument of, how this argument is developed, what are other arguments or theories from other authors. Paul and Elder (2006) refer that examples of hypothesis questions are: whether it is correct or incorrect, good or bad, relevant or irrelevant, effective or ineffective, do I disagree or agree, proven or not proven, not applicable or applicable, ethical or not ethical, what are the disadvantages and advantages of, what will be my opinion, what is the best solution to issue or conflict or problem, what are the cons and pros of, what should not or should happen and so on.

#### **2.4.2.5 Problem solving skills**

Hou et al (2007) point out the techniques for problem solving. First problem has to be identified, that is what the real problem we are facing is?, secondly context of the problem must be defined, that is what are the frame or context that frame this problem?, next to that problem choices has to be enumerated that is what are possible options available for the problems?, best options for problem must be analyzed, that is what is the best option for problem?, reasons must be listed explicitly for the best answers, that is why is this the best choice for problem?, finally choices must be checked once-again, that is what we missed. This technique of problem-solving guides students through the process of critical thinking as well as uses learner collaboration. Thus the problem-solving techniques enhance the problem-solving skills of the students.

According to Bucy (2006) and Ritchhart and Perkins (2005), critical thinking and problem solving is the capability to use facts, knowledge and data for efficiently solving problems. This doesn't mention that thinker has to give an immediate answer; it means that they have to think on their own, analyze problems and find solutions or answer (Bissell and Lemons, 2006). Thus the problem solving skills also related to critical thinking skills and they both helps to analyze the problems and identify the solutions.

### **2.4.3 Teachers as a critical thinkers**

Bissell and Lemons (2006) examined the teachers as a critical thinker and they try to identify and remove contradictions in thinking, connect all the values and dimensions of thinking, make sure that understanding model might really fits experiences of human and also ensure that understanding model is flexible to include new data and experiences and they recognizes that knowing, thinking and learning occur in a human beings' community (Hayes and Bailey, 2003). Hence as a critical thinker teacher tries to ensure that understanding model is understandable to others.

According to Zhang (2003) teacher as a critical thinker will be open-minded, habitually inquisitive, clear about issues, honest in facing personal problems, fair-minded in evaluation, flexible, well-informed, reasonable in the choosing the criteria and so on. They teach the same strategies to the students in order to enhance the students' critical thinking skills. Jonassen (2010) point out that as teachers transfer the approach from learning to thinking they must choose both informal and formal assessment tasks which help students to implement the processes of problem-solving and other critical thinking dimensions. The assignments must include real-world scenarios like research for exploring the feasibility of operating a service of campus shuttle, to devise a business plan to produce more income for local communities, manufacture a product for organic household and create artistic works for auction in order to help or support a local charity and so on. For finishing these projects students should plan to gather information, plan around a time frame, collaborate and analyze feasible solutions or alternatives and more. Thus teacher as a critical thinker can enhance the student's critical thinking skills.

### **2.5 Critical review on the studies on critical thinking skills among students in Schools**

Duran and Sendag (2012) carried out an investigation to determine the student's critical thinking skills in urban high school in an IT (information technology) within the context of Science, Technology, Engineering and Mathematics (STEM). Data were gathered from the Test of Everyday Reasoning (TER) that provides an overall score on Critical Thinking Skills) (CTS) and five sub-scale scores such as evaluation, analysis, inference, deductive reasoning and inductive reasoning. Critical thinking includes critical discussion and implication that has a critical role in solving problem and process of decision making. Student who possess critical thinking perform better than other students. Thus it is concluded that CTS is important in education.

Hove (2011) conducted a study among the high school students and their performance in critical thinking skills. It is identified that students who receive inference strategies in English's novel reading had enhanced their CTS than students who did not receive any inference reading strategies. Appamaraka et al. (2009) examined a study with ninth grade students. Findings of the study reveal that the group of

students who received instructional activities or training based on 5Es model of learning cycle with moves of metacognitive performed better in CTS than other students who had received instructional activities based on handbook teaching taught by teachers within duration of six weeks. To structure the instructional activities for the enhancement of critical thinking in some cases, the subject matter nature will be appropriate for students to use their thinking skills.

Scott (2009) carried out an investigation about students' perceptions learning critical thinking through debate in the classroom. The main aim of the study or course was to select the modern topics in technology and science in order to increase critical thinking and communication skills. Debate was a natural fit and mainly debate can enhance and develop the critical thinking ability and communication skills among students. Critical thinking is integrated with other required competencies such as communication and teamwork for the technology classroom. The debate in the classroom will be useful to help students and also to gain disciplinary knowledge with examining and presenting arguments. Debate process acts as teaching tools that are included in pedagogical methods since it permits students to improve critical thinking through gathering information, investigating arguments, assessing arguments, performing analysis, demonstrating inter-personal skills and questioning assumptions. Debate also permits teachers to create an environment which assists students to understand the active participation. In the technology classroom, debating contemporary opinions will be invaluable tool for boosting critical thinking. The study findings reflect that critical thinking skills are very essential skills for students.

Azar (2010) carried out a research to analyze the critical thinking dispositions impact on achievement of students. From the study findings, it is observed that critical thinking is considered as one of the higher-order thinking skills, it cannot be predicted by the academic achievement itself. It has occurred in particular time of formal operations. The development of assessment and measure tools are based on the thinking skills that are obtained from students like synthesis, analysis and assessment steps based on Bloom taxonomy and there are revised and used for measuring and assessing. This helps students who acquire Critical Thinking Dispositions (CTD) and skills. It is also observed that CTD and critical thinking levels among teachers are moderate, educational level, major class, task of educational level; gender variables and teaching experience do not affect the CTD and critical thinking levels of teachers. Even though the teachers' critical thinking level do not affect the critical thinking skills and CTD does not provide the same result among students. Students vary in their CTD and CTS. Thus it is concluded that the critical thinking is significant elements among scientific thinking and higher-order thinking skills.

Melhem and Isa (2013) conducted a research to study about enhancement of critical thinking skills among students with learning difficulties. Critical thinking is a significant educational concept and it is essential for the students. Findings of this research reveal that training on the programme of CoRT (cognitive research trust) can improve CTS among students who have difficulties in learning. A well-equipped classroom environment also plays a key role in the process of improving CTS among students. It is also observed that students who have difficulties in learning do and can benefit from instruction of thinking skills as well as they have to actively participate in CoRT programme that is mainly designed for developing and enhancing critical thinking. It is concluded that with the help of CoRT programme, students learning difficulties can be solved as well as improve the critical thinking skills.

## **2.6 Summary**

Critical thinking is the capability to decide what to believe with a disposition or knowledge to provide evidence in support of one's conclusion or suggestion and to ask for proof from others before deciding answer from their suggestions. It is reasoned, purposeful and goal-directed. Critical thinking is the process of determining the meaningfulness, accuracy, value of information and authenticity which raise the likelihood of reaching desired goals as recognized by the thinker. It is directed toward calculating probabilities, solving problems, making decision and deducing inferences. It helps to astute financial decisions, good career decisions and general life decisions. Teaching critical thinking to students might help them to differentiate various views and ideas and characterize the process. Teaching critical thinking is essential for students because by using instructional strategies they help students in the process of learning than depending on rote memorization and lecture. It focuses on instruction on learning process than depending on the content.

Learning environment is essential in order to develop the critical thinking to create meaningful discussion, stimulate student's interest and foster a supportive and trusting atmosphere and exposure to ideas and views of others. Effective critical questioning is the valuable strategies for teachers use for promoting critical thinking. Teachers as a critical thinker attempts to find out and remove contradictions in thinking, connect all the values and dimensions of thinking, make sure that understanding model will really fits experiences of human and also see ensure that understanding model is flexible to include new data and experiences and they recognizes that knowing, thinking and learning occur in a human beings' community. Thus it is summarized that teaching critical thinking in schools is essential in education institutions.

## **Chapter Three: Research Methodology**

### **3.1 Introduction**

Methodology could be described as “The examination of, the validation for, the specific method or methods utilized in a given research” (JANKOWICZ 1995). It pertains to the study procedure, the scheduled structure founded on which the study is done. The chief aim of this section is to offer an outline of the study pattern which was utilized by the author as the theory was developed, endeavoring to recognize if private schools in Abu Dhabi, UAE, cultivate ‘critical thinking’ as a chief aim of schooling. This section specifies the study procedure taken up and proceeds with an explanation of the information gathering as well as data examination techniques by the author together with the justification for the approach and techniques. The sources of primary as well as secondary data are described with relevant rationales. The preparation of detailed questionnaire and utilization procedure is portrayed in this section subsequently the validity and reliability of tests are presented.

### **3.2 Research Objective**

This study comprises a thorough examination of private schools in Abu Dhabi, UAE, which encourage ‘critical thinking’ abilities among students. Therefore, the study structured the research methodology so as to examine the research questions stated forth with:

#### **3.2.1 Specific objectives**

The three specific objectives are listed below. Specifically the current study was written:

- i. To identify the role of critical thinking skills in schools.
- ii. To determine teaching techniques that is used by the teachers for improving critical thinking skills among students.
- iii. To analyze teaching strategies used by teachers for improving critical thinking skills among students.

#### **3.2.2 Research Questions**

1. What do students think about learning critical thinking skills?
2. What teaching methods do teachers employ for improving ‘critical thinking’ skills among students?

3. What teaching strategies are used by teachers for improving 'critical thinking' skills among students?

### 3.3 Target population and target area

Vice principal, school inspector, 4<sup>th</sup> and 5<sup>th</sup> graders, teachers teaching English as a second language, Mathematics, Sciences and Social English were chosen as target population from Al Najah Private School in Abu Dhabi, UAE. Additionally University students graduating from the same school were chosen in this study.

### 3.4 Sampling

#### 3.4.1 Sampling group

The related information should be gathered so as to present suitable replies. The author has overlooked the census method of information gathering owing to its lacking features such as high expenses and additional consumption of time. Several studies carried out on the basis of research strategies utilize the probability sampling method (Saunders, M, Lewis, P, Thornhill 2007). The four major procedural phases established are stated forth with:

- Estimating the sampling arrangement
- Identifying the sample dimension
- Identifying best sampling technique
- Assessing the sampling to decide if it represents the complete population
- Identification of a particular structure of sampling
- Deciding the dimension of the sample
- Deciding the appropriate sampling method
- Examination of the sample to distinguish if it is representative of the total population

#### 3.4.2 Sampling technique

There are numerous kinds of sampling methods entailed for choosing the sample:

**Random Sampling:** The easiest form of sampling method is the random sampling method. It could be seen that all respondents have an option for being chosen. As the population to be assessed augments, it is a challenge to choose the precise sample dimension (Saunders 2003).

**Systematic sampling:** This form of sampling technique is generally known as the Nth name selection technique as the Nth name from the respondents is usually chosen (Saunders, 2003).

**Stratified sampling:** In this technique the respondents are segregated into various levels pertaining to the features and later the same number of samples is chosen from every cluster (Saunders 2003).

**Convenience sampling:** In this technique just a specific cluster of respondents are chosen from the total population owing to expense as well as time limitations. The sample chosen from this technique makes a supposition of representing a homogenous population, that is, a population with similar features and conduct. The respondents are usually chosen as they are easiest to contact for the research (Saunders, 2003).

**Judgment sampling:** In this sampling method, the samples are chosen from the sub-division of people of the entire population that relies on the decision of author. The author usually favors this technique of sampling as the selection procedure happens by assessing different methodological prospects thus facilitating the author to choose the suitable sample for the study procedure (Saunders, 2003).

The sampling methods stated forth with, are taken on by the author in the present study procedure.

**Table 3.2: Sampling adopted in different stages of sampling**

Sr.No	Evaluation/ Stage of Research	Type of sampling	Reasons
1	Pilot	Convenience	<ul style="list-style-type: none"> <li>• A smaller target group.</li> <li>• Requires participants who can contribute to improving the questionnaire.</li> </ul>
2	Questionnaire analysis	Judgment and Convenience	<ul style="list-style-type: none"> <li>• Logistic companies from different industries</li> </ul>

### 3.4.3 Size of the sample: Participant mix

The sample size of the participants such as Vice principal is 1, School Students are 100% as the actual sample size of 4 & 5 graders is 100. Teachers from English, Mathematics, Sciences and Social English subjects are 25% and university students are 50% are chosen as target population from Al Najah Private School in Abu Dhabi, UAE.

### **3.5 Data collection**

For this intent of research, and as programmed by research objectives and questions, the study basically focused on going to a Private School in Abu Dhabi, UAE. This research has selected Al Najah Private School to examine whether they utilize ‘critical thinking’ approaches in education. This study has chosen quantitative approach

#### **3.5.1 Quantitative data collection measures**

Qualitative as well as quantitative methods are the two methods of data collection techniques. In this research method, quantitative method is applied. In quantitative method the tools used to measure the information and calculate them in numerical arrangement, in order to attain a significant deduction. As per Punch (2005), the qualitative method decides the results from the information as words and notions in order to facilitate the outcomes like attitude or proposals which is possible to be quantified, are calculated and explained. Creswell (1998) describes the qualitative study procedure to be structured from the conventional ways of investigation were the authors might build multifaceted, holistic structures by way of examining the accounts and interpretation, and therefore construct the study. Frankel (1999) calculate that the qualitative study has its apprehension in assessing the advanced conducts and resources of specific activities, cluster, circumstances or materials and whereas alternatively the reliability or materialization of similar features are not taken into account.

#### **3.5.2 Mixed research strategy**

Mixed approach comprises both qualitative as well as quantitative information, it assists in expounding the questions during the study procedure and it is further seen to be an all-encompassing technique (Hayati, D., Karami, E. & Slee, 2006). The mixed method is an appropriate technique for illustrative study method since the queries which are to be addressed have not been investigated earlier. (Gable, 1994; Karami, et al.,2003; Scandura & Williams, 2000). The method fails to incorporate any stages of comparison as earlier information is not accessible. Thus, the findings from the mixed technique happen to be advantageous as the information of qualitative method are backed by information attained from the quantitative method (Easterby-Smith, M., et al., 1991; McGrath, 1982; Scandura, T. A., & Williams, 2000).

#### **3.5.3 Justification of the chosen strategy**

In this investigation, the investigator has taken up the quantitative methodology in order to collect the information. Objectivity, generalization and dependability of the selected investigative plan could be got by utilizing quantitative instruments of data examination (Creswell 2003). Nevertheless when one views qualitative instruments of investigation that are founded on examining, the accessible subject matter is portrayed in a statistical arrangement. Consequently it is frequently comprehended that quantitative investigation is objective in character whereas qualitative investigation is subjective in character. The current investigation, by now is to recognize whether private schools in Abu Dhabi, UAE, cultivate ‘critical thinking’ as a chief aim of schooling.

#### **3.5.4 Primary data collection methods**

The examination and primary assessment was done in procedural methodology, in order to gather the primary information and impacting the forth coming study procedure (Bryman, 2004). The primary and secondary information were gathered by the author in the present study procedure. Questionnaires were employed to gather primary information. The study instruments are detailed forth with:

#### **3.5.5 Questionnaire**

The questionnaire might be easy to execute but the result from the procedure happens to be very effectual (Zikmund, 2003). The major aim of the study is to recognize whether private schools in Abu Dhabi, UAE, promote ‘critical thinking’ plans amongst students. The participants can express their deep viewpoints, outlooks and insights owing to the unidentified characteristic of the questionnaire.

#### **3.5.6 Mode of Questionnaire Development**

For the survey questionnaire together with open questionnaire and closed questions were also incorporated. The structure of the questionnaire includes queries like age, gender and this is the chief element of quantitative approach. The questionnaire further incorporated Multiple Choice Questions (MCQ) in its study procedure. The questions were focused mainly on the school’s goals and the training programs for the improvement of teachers. Additionally the Likert Scales were utilized allowing the participants to convey their outlooks to the establishment in a very effectual way. The participants were requested to respond to the Likert Scale queries by way of particular array of replies which might begin from ‘Strongly Agree’ and finish with ‘Strongly Disagree’. Dundas (2004) proposes that by employing the Likert Scale, the questionnaire method happens to be advantageous as it contains the ability to distinguish diverse degrees of approaches. The structure of the questionnaire was formatted in a way that general data are gathered at the initial phase and subsequent queries pertain to the chief aspects (Arab, 2007).

### **3.6 Selection of survey participants**

Students were selected from an Al Najah Private School who belonged to grades five and four, as the 4<sup>th</sup> and 5<sup>th</sup> grades were expected to express their self using various activities and discussions. Students of these ages can create their own viewpoint, think or react to the instructions of teachers' like they were trained to do it. The teachers who handle various subjects like English, Maths, Science and Social English teachers, were also chosen for the task.

### **3.7 Survey process for teachers and students**

Before beginning the process of the survey, the researcher must obtain prior permission from the respective school. Questionnaire was distributed to the staff that had questions which were aimed at the school objectives and its training programs towards the development of staff and the questionnaire was provided to the students so as to give enough evidence regarding the point of views towards strategies related to teaching and learning. The questions of the questionnaire were direct yet brief hence it saved the time.

### **3.8 University Students**

The survey also was carried out with university students who were graduates of Al Najah Private School. Questionnaire was offered to the students to derive the results and its outcomes regarding the present teaching strategies followed in schools, its effect on the future students who enrolled in universities and colleges. To reach the goal the open end question was included in this questionnaire. Lastly, the data collected through the questionnaire underwent an analysis and the comments of students' were converted as points on a separate sheet.

### **3.9 Questionnaire analysis**

By using the two major survey methods the questionnaire framed for the research and study which are aimed at the teachers and students.

### **3.10 Validity of the study**

The validity of the research is determined on the basis of complete verifying feature of the findings which are obtained from the study (Saunders, 2003).

## **Construct validity**

Based on (Stake, 1995), construct validity is derived by obtaining various sources which are beneficial for the triangulation process. The primary tool that was implemented for the purpose of data collection is through questionnaires. Through the evidence chain, the data collection method is recalled (Yin, 1994).

## **Pilot study**

According to suggestion of (Cooper, D. R. and Schindler, 2003), the researcher must perform a pilot study using tools of data collection to validate before beginning the actual process of research. The research methodology problems and techniques of data gathering can be derived with the pilot study to improve the study's effectiveness.

For the research purpose, the pilot study was carried out on volunteers chosen from the closed population. The study purpose was to evaluate the tools of data collection like the survey questionnaire regarding factors like understandability, cultural synchronization and readability of the matter.

To detect the survey instruments and its effectiveness, the researcher seeks the help of the experts in their respective field. The experts have guided the researcher to recognize some small issues like spelling of the questions, the language and techniques of data gathering.

This helped the researchers greatly to minimize the potential pitfalls with respect to full research and hence improved its validity and made a reliable research (Cooper, D. R. and Schindler, 2003). The perfection of research techniques employed was assessed using the help of some volunteers. To complete the pilot study successfully, a minimum number of at least ten people were required for the questionnaire (Fink, 2003). Usually such tests is considered as tiny versions of the real research, to help the researchers to identify the pitfalls (Royce, R., Wald, P., Sheppard, D. and Balmes, 1993). The evaluation of the questionnaire was by fifteen volunteers who belonged to target population to check few essential factors like the flow of questions, logic, clarification, language, and time offered to administer the questionnaire etc.

Through the pilot study, it was revealed that the respondents wanted a statement of introductory before they answered the questionnaire and the time allotted for answering the questionnaire (which was 20 minutes) was considered as enough. Hence, the effectiveness of the study was enhanced using the pre-test.

## **Internal validity**

The true features of the results derived by the study were obtained using internal validity (Remenyi et al., 1998). It was derived through internal variability which was based on reliable measurement performed on the tool; it is ideal for justification which relates the variables. Internal

validity is also used to predict casual control. Through avoiding such casual threats, the internal validity would not be constrained. The casual threats would be

- Perceptual inaccuracies: Not accurate while recollecting a past event
- Halo effect: subject's precondition in order to answer
- Memory recall bias: participant's bias and forgetfulness and
- Reflexivity: The subject offers an answer that is considered as correct and not irrespective of what he or she would actually feel (Remenyi, D. *et al.*, 1998).

### **External validity**

Remenyi et al. (1998) briefs the external validity. The external validity refers to the study outcome's extension or improvement in a wider context over the current research environment. The present researches do not include external validity and not within the research's range.

### **3.11 Ethical approaches**

In the current study, the investigator has addressed all the ethical implications in every step of the research. Every participant in the current study, researcher gives the assurance to Anonymity. In order to ensure their participation the investigator must conduct a confidentiality test in before starting the research and at the time of test social demographic information such as address, mobile number, email and name were not gathered from the participants. 3.13. Informed consent

The important element of the research is informed consent. Therefore the reliability of the current study is ensured by informed consent process. The investigator has described the rationale and objectives for the present study to all the participants.

### **3.12 Data Analysis**

Quantitative data was collected for this research method. Therefore, various data collecting techniques needed to be implemented at the research end.

#### **3.12.1 Quantitative Analysis**

The data collected were analyzed with the help of a statistical package. The researcher used Statistics Package for Social Science software or SPSS are the popular package employed to test the survey. Inferential and descriptive statistics are employed for the analysis of data. The investigator

utilized various descriptive statistics for describing the information's fundamental model (Lawrence, 2006).

### **3.12.2 Percentage analysis**

This stands for special ratio kind. So to compare a data series and to guess their relationship, the percentages were considered. When the percentage lowered the factors as the common base, its comparison was much easier.

### **3.12.3 Cronbach's alpha**

The statistical software package like SPSS is employed to identify its reliability through measurement of the reliability coefficients that is also called as Cronbach's Alpha ( Abdel-Fattah, 2008; Fattah, 2008). The Cronbach's Alpha value is from 0 to 1. The instrument reliability and questions used in the questionnaire were considered as high as its value is bigger. The researcher showed that Cronbach's Alpha was good to measure the entire scales utilized in the questionnaire.

### **3.12.4 Chi-Square Test**

Chi-Square test is highly utilized compare the collected data using the data that is expected from a certain hypothesis. The Mendel's laws, the male participants' expectation is 10 and it appears as 8 male participants, and with comparison, the data collected is important or not. Chi-Square test has a concern with null hypothesis that is determined by the researcher and it reveals that there were no specific differences existing among the expected data and the obtained data.

### **3.12.5 Pearson Correlation**

The statistical test was carried out by calculating the relationship between two continuous variables. The directly proportional relationship prevailing among the variables is achieved through positive values, and inverse proportionality is arrived using negative values. The positive interrelation is revealed with values more than 0.8. Also regression, path analysis of Hierarchical regression analysis with the structural equation model is employed for testing the hypothesis.

## **3.13 Summary**

The measures of data collection include a quantitative approach with the help of the questionnaire. Such detailed research methodology offers various reasons to adopt such measures as an outline. It also offers a detailed list with research questions and hypotheses used by the study. The next chapter offers the results achieved while the survey instruments were participants specific related to the study.

## CHAPTER IV: RESULTS

### 4.1 Introduction

The results chapter described the analysis and results of quantitative data which are gathered from the “Do Private Schools in Abu Dhabi UAE foster critical thinking as one of the main objectives of education” questionnaires, in schools. The information was included in excel files and transferred the data into SPSS 21.0 version. Therefore, the current research were analysed by using SPSS software. At the first level the outliers, logical and Missing data are checked. The data accuracy was analysed by questionnaire in the way of proof reading against the SPSS data window.

The categorical variables are calculated by using the descriptive statistics mode of SPSS frequencies. Ranking has been done for the likert scale questions have been observed. Non-parametric tests such as kruskal Wallis test has been used to compare the mean ranks between different subject teachers. Spearman’s Rank correlation has been used to find the relationship between teacher’s teaching strategies and students learning methods.

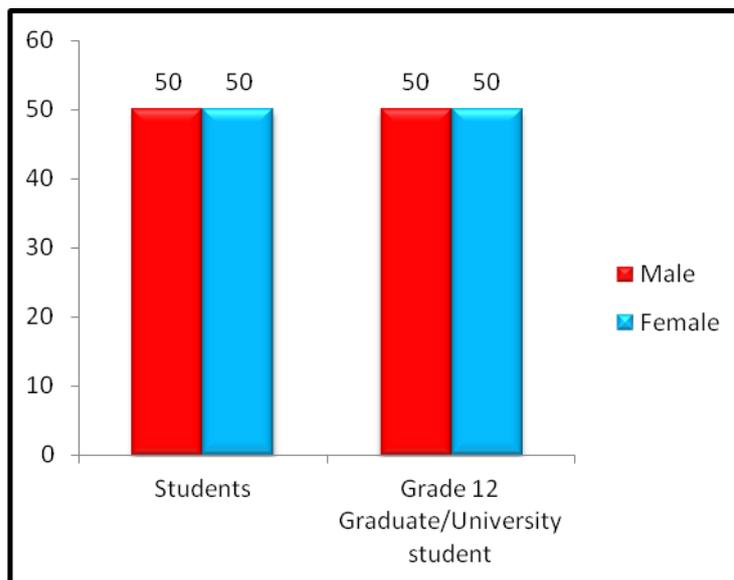
### 4.2 Student questionnaire

**Table 1: Frequency for Gender**

	Gender		Total
	Male n (%)	Female n (%)	
<b>Students</b>	50 (50)	50 (50)	100 (100.0)
<b>Grade 12 Graduate/University student</b>	25 (50)	25 (50)	50 (100.0)

Table 1 presents the gender of the respondent. There are equal numbers of male and female in the sample.

**Figure 1: Percentage for Gender**



**Table 2: Frequency for teaching strategy prefer**

		Gender			
		Male		Female	
		N	%	N	%
Which teaching strategy do you prefer?	The teacher to lecture while you are just listening	51	68.0	0	0.0
	To participate in discussion and have activities	24	32.0	75	100.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 2 presents the teaching strategy do you prefer. 68% of the male answered the teacher to lecture while you are just listening. While 100% of the female answered to participate in discussion and have activities

**Table 3: Frequency for teacher encourage to ask questions**

		Male		Female	
		N	%	N	%
Does the teacher encourage you to ask questions?	Yes	70	93.3	1	1.3
	No	5	6.7	3	4.0
	Sometimes	0	0.0	71	94.7
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 3 presents the teacher encourage you to ask questions. 93.3% of the male answered yes to the question. While 94.7% of the female answered to sometime to the question.

**Table 4: Frequency for how do you study for the exams**

		Male		Female	
		N	%	N	%
How do you study for the exams?	Memorize all the textbook contents, questions and answers	49	65.3	0	0.0
	Understand the lessons/textbook to write using your own words	26	34.7	47	62.7
	Other	0	0.0	28	37.3
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 4 presents the how you study for the exams. 65.3% of the male answered memorize all the textbook contents, questions and answers. While 62.7% of the female answered to understand the lessons/textbook to write using your own words.

**Table 5: Frequency for share your points view with your teacher**

		Male		Female	
		N	%	N	%
Do you share your points of view with your teacher?	Yes	52	69.3	0	0.0
	No	18	24.0	2	2.7
	Sometimes	5	6.7	73	97.3
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 5 presents do you share your points of view with your teacher. 69.9% of the male answered yes to the question. While 97.3% of the female answered to sometime to the question.

**Table 6: Frequency for problem to understand a point in the lesson**

		Male		Female	
		N	%	N	%
If you have a problem to understand a point in the lesson, would you?	Ask the teachers questions to explain it for you	75	100.0	36	48.0
	Memorize it as it is	0	0.0	0	0.0
	Ask your friend/someone later to explain it for you	0	0.0	29	38.7
	Other	0	0.0	10	13.3
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 6 presents you have a problem to understand a point in the lesson, would you. 100.0% of the male answered memorize all the textbook contents, questions and answers. While 48.0% of the female answered to ask the teachers questions to explain it for you.

**Table 7: Frequency for favorite lesson**

		Male		Female	
		N	%	N	%
What is your favorite lesson?	Maths	47	62.7	0	0.0
	English	28	37.3	27	36.0
	Sciences	0	0.0	45	60.0
	Social Studies	0	0.0	3	4.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 7 presents your favorite lesson. 62.7% of the male answered maths whereas 60.0% of the female answered science.

**Table 8: Frequency for lesson you like the least**

		Male		Female	
		N	%	N	%
Which lessons do you like the least?	Maths	49	65.3	0	0.0
	English	9	12.0	0	0.0
	Sciences	17	22.7	16	21.3
	Social Studies	0	0.0	59	78.7
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 8 presents lesson does you like the least. 65.3% of the male answered maths whereas 78.7% of the female answered Social science.

**Table 9: Frequency for frequently ask questions you did not understand in the lesson**

		Male		Female	
		N	%	N	%
Do you frequently ask questions about something you did not understand in the lesson?	Yes	72	96.0	18	24.0
	No	3	4.0	57	76.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 9 presents frequently ask questions about something that are not understand in the lesson. 96.0% of the male answered yes to the question. While 76% of the female answered to no to the question.

**Table 10: Frequency for teachers encourage to participate in discussions**

		Male		Female	
		N	%	N	%
Do your teachers encourage you to participate in discussions?	Yes	60	80.0	0	0.0
	No	11	14.7	0	0.0
	Sometimes	4	5.3	75	100.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 10 presents your teachers encourage you to participate in discussions. 80.0% of the male answered yes to the question. While 100.0% of the female answered to sometime to the question.

**Table 11: Frequency for teachers ask you to study for the exams**

		Male		Female	
		N	%	N	%
Did your teacher(s) ask you to study for the exam(s)?	To get high grades	75	100.0	16	21.3
	To enhance your critical thinking skills	0	0.0	38	50.7
	Other	0	0.0	21	28.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 11 presents did your teacher(s) ask you to study for the exam. 75.0% of the male answered to get high grades. While 50.7% of the female answered to enhance your critical thinking skill

**Table 12: Frequency for teachers depend that you will**

		Male		Female	
		N	%	N	%
The teachers depend that you will	Memorize and recall information	36	48.0	0	0.0
	Understand, think for yourself and solve problems by your own	39	52.0	54	72.0
	Other	0	0.0	21	28.0
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 12 presents the teachers depend that you will. 52.0% of the male answered understand, think for yourself and solve problems by your own. While 72.0% of the female answered understand, think for yourself and solve problems by your own.

**Table 13: Frequency for does school prepare you to study in the university**

		Male		Female	
		N	%	N	%
Does school prepare you to study in the university?	Yes	67	89.3	7	9.3
	No	3	4.0	7	9.3
	Sort of	5	6.7	61	81.3
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 13 presents school prepares you to study in the university. 89.3% of the male answered yes to the question. While 81.3% of the female answered to sort of to the question.

**Table 14: Frequency for type of teaching strategy**

		Male		Female	
		N	%	N	%
Your teachers use the following teaching strategy	Lecturing and talking	53	70.7	11	14.7
	Discussing and facilitating	22	29.3	50	66.7
	Others	0	0.0	14	18.7
	<b>Total</b>	<b>75</b>	<b>100.0</b>	<b>75</b>	<b>100.0</b>

Table 14 presents your teachers use the following teaching strategy. 70.7% of the male answered Lecturing and talking whereas 66.7% of the female answered Discussing and facilitating.

**Table 15: Frequency for comments regarding teaching strategies**

		Male		Female	
		N	%	N	%
What are your comments regarding teaching strategies in Private Schools and what are your Suggestions for further improvement	Good	50	100.0	8	16.0
	Not good	0	0.0	34	68.0
	No comment	0	0.0	8	16.0
	<b>Total</b>	<b>50</b>	<b>100.0</b>	<b>50</b>	<b>100.0</b>

Table 15 presents comments regarding teaching strategies in Private Schools and what are your Suggestions for further improvement. 100.0% of the male answered good. While 68.0% of the female answered not good.

### 4.3 Teaching questionnaire

**Table 16: Descriptive statistics for teacher's age**

	Male	Female
	Mean±SD	Mean±SD
Age	35.0±5.9 (26-45)	35.8±5.8 (28-45)

**SD- Standard Deviation; (Max-Min)**

Table 16 presents the average age for the male teacher is 35, with a maximum of 45 and minimum of 26 years. While average age for the female teacher is 36 with a maximum of 45 and minimum of 28 years.

**Table 17: Ranking of teacher's critical thinking in the observed school**

	N	%	Ranking
Students respond to other students.	48	100.0%	1
Teacher works from organized information.	47	97.9%	2
Teacher's presentation is logically organized.	45	93.8%	3
Teacher asks students to justify and explain their thoughts.	45	93.8%	3
Teacher allows at least ten seconds wait time for students answer before restating the question.	44	91.7%	4
Teacher asks students to clarify and justify their response.	43	89.6%	5
Students work in pairs or small groups.	43	89.6%	6
Teacher seeks evidence for stated claims	43	89.6%	6
Teacher probes for correct response	41	85.4%	7
More than one student is queried for point of view/solution.	40	83.3%	8
Students help others to analyze and solve problems.	39	81.2%	9
Teacher acts as facilitator.	39	81.2%	9

Teacher accepts all valid students' responses.	38	79.2%	10
	<b>N</b>	<b>%</b>	<b>Ranking</b>
Encourages students to ask question	38	79.2%	10
Teacher allows time to consider alternative/point of view.	37	77.1%	11
Teacher asks open ended questions with multiple answers.	37	77.1%	11
Teacher withholds correct responses; encourages students to explore possibilities	37	77.1%	11
Teacher frequently asks, "Why do you think so?"	36	75.0%	12
Teacher appropriately uses a Variety of visual media (charts, chalkboard, maps, pictures, gestures).	36	75.0%	12
Students take note systematically.	35	72.9%	13
Students relate learning to past experience or similar situations	34	70.8%	14
Encourages transfer of cognitive skills to everyday life	34	70.8%	14
Ideas are graphically symbolized during instruction.	33	68.8%	15
Teacher poses problematic situation	33	68.8%	15
Teacher poses "what if" suppose that" questions	32	66.7%	16
Teacher encourages transfer at end of lesson with Comments like, "this will help you in your everyday Life in this way..."	32	66.7%	16
Teacher reinforces students for responding to open ended questions	32	66.7%	16
Teacher encourages students to answer other student's questions.	31	64.6%	17
Incorrect students respond elicit encouraging, supportive comments.	21	43.8%	18

Provides visual cues for developing cognitive strategies	17	35.4%	19
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Table 17 presents the ranking of teacher's critical thinking in the observed school based on percentage. The highest rank with 1 is Students respond to other students followed by Teacher works from organized information with rank 2 and lowest rank with Provides visual cues for developing cognitive strategies ranked 19.

A statistical method like Exploratory factor analysis (EFA) which helps to explore the theoretical structure of the phenomena and to minimise the information to a smaller set of summary variables. . In order to determine underlying dimensions of multi-item measurement scales used in this study, principal components analysis with varimax rotation using SPSS 21.0 was performed for all constructs in the analysis. The number of factors for each scale is determined by using the Minimum eigen values of 1.0 and with loading above 0.50 on a single factor was retained. Initially, the factorability of 30 items was examined.

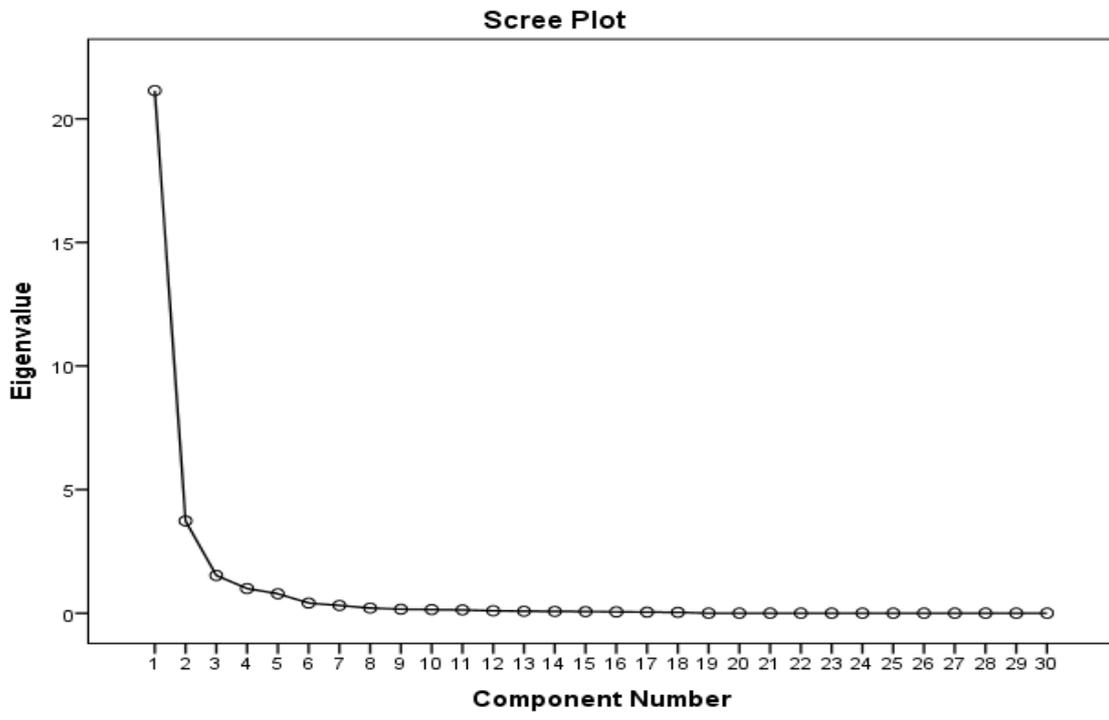
**Table 18: Factor analysis (N=50)**

<b>Rotated Component Matrix</b>				<b>% variance explained</b>
	<b>Component</b>			
	<b>1</b>	<b>2</b>	<b>3</b>	
Encourages students to ask question	<b>.836</b>			<b>70.5</b>
Teacher accepts all valid students' responses.	<b>.836</b>			
Teacher asks open ended questions with multiple answers.	<b>.828</b>			
Teacher allows time to consider alternative/point of view.	<b>.828</b>			
Teacher withholds correct responses; encourages students to explore possibilities	<b>.828</b>			
Students help others to analyze and solve problems.	<b>.813</b>			
Teacher acts as facilitator.	<b>.813</b>			
Teacher frequently asks, "Why do you think so?"	<b>.780</b>			
Teacher appropriately uses a Variety of visual media (charts, chalkboard, maps, pictures, gestures).	<b>.780</b>			
More than one student is queried for point of view/solution.	<b>.756</b>			
Students take note systematically.	<b>.716</b>			
Teacher probes for correct response	<b>.682</b>			
Teacher encourages students to answer other student's questions.		<b>.801</b>		<b>82.9</b>
Incorrect students respond elicit encouraging, supportive comments.		<b>.799</b>		
Teacher encourages transfer at end of lesson with Comments like, "this will help you in your everyday Life in this way..."		<b>.794</b>		
Teacher poses "what if" suppose that" questions		<b>.794</b>		

Teacher reinforces students for responding to open ended questions		<b>.794</b>		
Provides visual cues for developing cognitive strategies		<b>.749</b>		
Teacher poses problematic situation		<b>.748</b>		
Ideas are graphically symbolized during instruction.		<b>.748</b>		
Students relate learning to past experience or similar situations		<b>.680</b>		
Encourages transfer of cognitive skills to everyday life		<b>.680</b>		
Teacher asks students to justify and explain their thoughts.			<b>.888</b>	
Teacher's presentation is logically organized.			<b>.888</b>	
Teacher allows at least ten seconds wait time for students answer before restating the question.			<b>.847</b>	
Teacher works from organized information.			<b>.828</b>	<b>88.0</b>
Students work in pairs or small groups.			<b>.791</b>	
Teacher seeks evidence for stated claims			<b>.791</b>	
Teacher asks students to clarify and justify their response.			<b>.791</b>	
Students respond to other students.			<b>.737</b>	
Extraction Method: Principal Component Analysis.				
Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 9 iterations.				

Table 18 represents the findings of the factor analysis and a detailed description of each item for each of the three main factors. Factor loadings ranged from 0.888 to 0.680. Factor 1 loading ranged from 0.836 to 0.682; factor 2 loading ranged from 0.801 to 0.680 and third factor loading ranged from 0.888 to 0.737 respectively. All the factors accounted for 71-88% of the variance. The three reduced factors are given new name.

**Figure 2: Scree plot**



**Table 19: Teachers critical thinking in the observed school for male and female**

Teachers critical thinking in the observed school		Gender			
		Male		Female	
		N	%	N	%
Students work in pairs or small groups.	Yes	25	100.0	18	72.0
	No	0	0.0	7	28.0
	Total	25	100.0	25	100.0
Students respond to other students.	Yes	25	100.0	23	92.0
	No	0	0.0	2	8.0
	Total	25	100.0	25	100.0
Students help others to analyze and solve problems.	Yes	25	100.0	14	56.0
	No	0	0.0	11	44.0
	Total	25	100.0	25	100.0
Teacher accepts all valid students' responses.	Yes	25	100.0	13	52.0
	No	0	0.0	12	48.0
	Total	25	100.0	25	100.0
Incorrect students respond elicit encouraging, supportive comments.	Yes	21	84.0	0	0.0
	No	4	16.0	25	100.0
	Total	25	100.0	25	100.0
Teacher works from organized information.	Yes	25	100.0	22	88.0
	No	0	0.0	3	12.0
	Total	25	100.0	25	100.0
Students take note systematically.	Yes	25	100.0	10	40.0
	No	0	0.0	15	60.0
	Total	25	100.0	25	100.0
Teacher's presentation is logically organized.	Yes	25	100.0	20	80.0
	No	0	0.0	5	20.0
	Total	25	100.0	25	100.0
Ideas are graphically symbolized during instruction.	Yes	25	100.0	8	32.0
	No	0	0.0	17	68.0

	Total	25	100.0	25	100.0
Teacher acts as facilitator.	Yes	25	100.0	14	56.0
	No	0	0.0	11	44.0
	Total	25	100.0	25	100.0
Teacher probes for correct response	Yes	25	100.0	16	64.0
	No	0	0.0	9	36.0
	Total	25	100.0	25	100.0
Teacher seeks evidence for stated claims	Yes	25	100.0	18	72.0
	No	0	0.0	7	28.0
	Total	25	100.0	25	100.0
Teacher frequently asks, “Why do you think so?”	Yes	25	100.0	11	44.0
	No	0	0.0	14	56.0
	Total	25	100.0	25	100.0
Students relate learning to past experience or similar situations	Yes	25	100.0	9	36.0
	No	0	0.0	16	64.0
	Total	25	100.0	25	100.0
Teacher allows time to consider alternative/point of view.	Yes	25	100.0	12	48.0
	No	0	0.0	13	52.0
	Total	25	100.0	25	100.0
More than one student is queried for point of view/solution.	Yes	25	100.0	15	60.0
	No	0	0.0	10	40.0
	Total	25	100.0	25	100.0
Teacher asks students to justify and explain their thoughts.	Yes	25	100.0	20	80.0
	No	0	0.0	5	20.0
	Total	25	100.0	25	100.0
Teacher asks open ended questions with multiple answers.	Yes	25	100.0	12	48.0
	No	0	0.0	13	52.0
	Total	25	100.0	25	100.0
Provides visual cues for developing cognitive strategies	Yes	17	68.0	0	0.0
	No	8	32.0	25	100.0
	Total	25	100.0	25	100.0
Teacher appropriately uses a Variety of visual media (charts, chalkboard, maps, pictures, gestures).	Yes	25	100.0	11	44.0
	No	0	0.0	14	56.0
	Total	25	100.0	25	100.0

Teacher poses “what if” suppose that” questions	Yes	25	100.0	7	28.0
	No	0	0.0	18	72.0
	Total	25	100.0	25	100.0
Encourages transfer of cognitive skills to everyday life	Yes	25	100.0	9	36.0
	No	0	0.0	16	64.0
	Total	25	100.0	25	100.0
Teacher encourages transfer at end of lesson with Comments like, “this will help you in your everyday Life in this way...”	Yes	25	100.0	7	28.0
	No	0	0.0	18	72.0
	Total	25	100.0	25	100.0
Teacher allows at least ten seconds wait time for students answer before restating the question.	Yes	25	100.0	19	76.0
	No	0	0.0	6	24.0
	Total	25	100.0	25	100.0
Teacher asks students to clarify and justify their response.	Yes	25	100.0	18	72.0
	No	0	0.0	7	28.0
	Total	25	100.0	25	100.0
Teacher reinforces students for responding to open ended questions	Yes	25	100.0	7	28.0
	No	0	0.0	18	72.0
	Total	25	100.0	25	100.0
Encourages students to ask question	Yes	25	100.0	13	52.0
	No	0	0.0	12	48.0
	Total	25	100.0	25	100.0
Teacher poses problematic situation	Yes	25	100.0	8	32.0
	No	0	0.0	17	68.0
	Total	25	100.0	25	100.0
Teacher withholds correct responses; encourages students to explore possibilities	Yes	25	100.0	12	48.0
	No	0	0.0	13	52.0
	Total	25	100.0	25	100.0
Teacher encourages students to answer other student’s questions.	Yes	25	100.0	6	24.0
	No	0	0.0	19	76.0
	Total	25	100.0	25	100.0

Table 19 presents the teachers critical thinking in the observed school for male and female. Of total 25 male teachers responds to observed critical thinking. While 44% female teacher responds to the first statement.

#### 4.4 Observation Checklist

**Table 20: Descriptive statistics for Teachers strategy (N=20)**

Teachers Strategy	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
Mean±SD								
The teachers use short quizzes at the end of each lesson to recall information	4.40±0.89	1	3.40±0.89	4	3.80±0.84	3	2.60±0.89	8
The teachers read from the textbooks to explain the lesson.	4.20±0.84	2	3.00±1.23	6	3.60±1.14	4	3.80±0.45	3
Underline the information in the text book.	4.00±1.00	3	2.00±1.23	10	3.20±0.84	6	4.20±0.84	2
Answers should be from the textbook using the same exact words.	4.00±0.70	3	4.00±1.00	1	2.60±0.55	8	4.40±0.89	1
The teachers prepare answers to the textbook questions.	3.60±1.14	4	2.80±1.10	7	4.20±1.10	1	3.40±0.55	5
Listen only to teachers lectures.	3.60±1.14	4	3.80±0.45	2	3.60±0.89	4	4.20±0.84	2
Lack of confidence and self esteem.	3.60±1.14	4	3.00±1.23	6	2.40±1.14	9	2.60±1.34	8
Students used model answers to exercises and textbook questions.	3.40±0.89	5	3.20±1.48	5	3.40±1.14	5	3.00±0.71	6

Teachers Strategy	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
	Mean±SD							
Students focus on recall of isolated facts.	3.40±0.89	5	3.60±1.14	3	4.00±1.00	2	3.60±1.14	4
Students do not get a chance to talk in the classroom and express their thoughts.	3.20±1.10	6	2.20±0.84	9	2.20±0.84	10	4.20±0.84	2
Great emphasize on grades and tests (performance rather than effort).	3.00±1.00	7	2.60±0.89	8	2.60±1.52	8	3.00±1.00	6
Students perform only for grades.	3.00±1.00	7	3.20±1.30	5	2.80±1.10	7	3.80±1.30	3
Rote memorization	2.80±0.84	8	2.80±1.10	7	3.20±1.10	6	3.60±1.14	4
Teachers shout at students and use discouraging words such as: not focusing, getting low grades, not remembering, not listening etc.	2.60±0.55	9	3.60±1.14	3	3.20±1.30	6	4.20±0.84	2
Students are bored and never ask questions.	2.20±0.84	10	2.60±1.14	8	2.60±0.89	8	4.40±0.89	1

Students do not get a chance to talk in the classroom and express their thoughts.	2.00±0.71	11	2.80±0.84	7	2.60±1.14	8	2.80±0.84	7
Students are afraid to ask questions about the lessons	1.80±0.84	12	2.80±0.84	7	2.60±1.14	8	3.80±0.84	3

Table 20 presents the ranking of teacher's strategy for different subject's teacher. The teachers use short quizzes at the end of each lesson to recall information ranked 1 for English language teachers. Similarly ranked 12 for Students are afraid to ask questions about the lessons.

**Table 21: Difference in mean of teacher's teaching strategies between different subject teachers**

	Subject	N	Mean Rank
Teacher's teaching strategies	English language Teachers	5	11.40
	Maths Teachers	5	8.30
	Science Teachers	5	10.20
	Social English Teachers	5	12.10
	<b>Total</b>	<b>20</b>	

Test Statistics	
	Teacher's teaching strategies
Chi-Square	1.193
df	3
P-Value	.755
a. Kruskal Wallis Test	
b. Grouping Variable: Subject	

Table 21 presents the mean of teacher's teaching strategies between different subjects using non-parametric test. The P-value is 0.755 which is greater than 0.05 so accept the hypothesis and conclude that there is no difference in the mean rank between different subjects.

## 4.5 Observation Report

**Table 22: Descriptive statistics for the Teacher's teaching strategies and students learning method**

Teacher's teaching Strategy and students learning methods	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
	Mean±SD							
Teacher wrote the title on the white board	5.00±0.00	1	5.00±0.00	1	4.20±1.79	3	4.20±1.10	2
Students opened their text books	5.00±0.00	1	5.00±0.00	1	4.40±0.89	2	3.40±0.89	4
Students listen to the teacher	5.00±0.00	1	4.40±0.89	3	4.00±1.41	4	2.20±1.10	8
After she/he finished lecturing about the lesson, she/he started to ask questions about it, (to retrieve the information).	4.60±0.89	2	3.60±1.67	4	3.60±0.89	6	1.80±0.84	10
Students start answering and asking each other when a work is assigned.	4.60±0.89	2	3.40±2.19	5	3.40±1.67	7	3.00±1.41	5
Teacher used a diagram/chart/map/picture to explain the lesson.	4.20±1.10	3	1.00±0.00	14	4.20±1.10	3	2.60±1.67	6

Teacher's teaching Strategy and students learning methods	English language teachers	Ra nki ng	Maths Teachers	Ran king	Science Teachers	Ran king	Social English Teachers	Ra nki ng
	Mean±SD							
Students are discussing and listening to each others	3.40±1.67	4	4.60±0.89	2	4.00±1.41	4	2.00±1.00	9
Students write notes on their notebook and listen.	3.40±0.52	4	5.00±0.00	1	4.60±0.89	1	3.00±1.23	5
At the end of each lesson, the teacher gave them short quizzes about the lessons.	3.20±1.30	5	2.20±1.79	11	3.40±1.67	7	1.80±1.10	10
She/he started to talk about the lesson for 30 minutes constantly in every lesson.	3.20±1.10	5	2.80±0.84	8	3.40±1.52	7	4.60±0.89	1
She/he collected quizzes and said: "I will grade them later".	3.20±1.30	5	1.00±0.00	14	3.80±1.79	5	2.20±1.10	8
Teacher asked students to pay attention because she would give them a quiz at the end.	3.00±1.23	6	2.40±1.52	10	3.00±1.41	9	3.80±0.45	3
Students check the answers with their peers.	2.80±1.30	7	2.60±1.67	9	3.20±1.10	8	1.80±1.10	10
Students start to underline the sentences using coloring pens, and most of them were looking at each other's book to do the same.	2.60±0.89	8	2.80±0.45	8	4.00±1.00	4	2.20±1.10	8

Teacher's teaching Strategy and students learning methods	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
	Mean±SD							
Students remain silent	2.20±1.10	9	2.20±1.64	11	2.20±1.79	10	2.40±1.67	7
She/he asked the students to close their books to listen & pay attention.	2.20±0.45	9	3.00±1.41	7	3.80±1.79	5	4.60±0.89	1
Students close textbooks and listen	2.20±1.10	9	3.60±1.34	4	4.20±1.79	3	3.00±2.00	5
Teacher asked students to underline the important sentences in the text book.	2.00±1.41	10	3.20±1.10	6	4.40±0.89	2	2.20±1.10	8
Teacher shouted at students and said: "Why don't you focus and listen carefully, how will you answer in the exam".	1.60±0.55	11	1.40±0.55	13	3.00±1.41	9	2.20±1.10	8
Only few students (sometimes 2) raise their hands to answer.	1.60±0.55	11	2.00±0.71	12	3.00±1.41	9	2.60±1.67	6
Teacher asked the students to pay attention to the lesson then she/he said: "I will bring a question from this lesson in the exam".	1.20±0.45	12	1.00±0.00	14	1.40±0.89	11	2.20±1.10	8
Students are looking around and drawing in their text books.	1.20±0.45	12	1.40±0.89	13	2.20±1.79	10	2.40±1.95	7

Table 22 presents the ranking of Teacher's teaching Strategy and students learning methods for different subject's teacher. Teacher wrote the title on the white board ranked 1 for English language teachers. Similarly ranked 12 for Students are looking around and drawing in their text books.

**Table 23: Difference in mean of teacher's teaching strategies between different subject teachers**

		<b>Subjects</b>	<b>N</b>	<b>Mean Rank</b>
Teacher's strategies	teaching	English language Teachers	5	11.00
		Maths Teachers	5	7.00
		Science Teachers	5	13.50
		Social English Teachers	5	10.50
		<b>Total</b>	<b>20</b>	

<b>Test Statistics</b>	
	<b>Teacher's teaching strategies</b>
Chi-Square	3.078
df	3
P-value	0.380
a. Kruskal Wallis Test	
b. Grouping Variable: Subject	

Table 23 presents the mean of teacher's teaching strategies between different subjects using non-parametric test. The P-value is 0.380 which is greater than 0.05 so accept the hypothesis and conclude that there is no difference in the mean rank between different subjects.

**Table 24: Relation between teacher's teaching strategies and Students learning methods**

<b>Spearman's rho Rank correlation</b>	<b>Students learning methods</b>
<b>Teacher's teaching strategies</b>	<b>.826**</b>

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

Table 24 presents the spearman's rank correlation between teacher's teaching strategies and students learning methods. The correlation analysis shows the linearity between the variables not the strength of association between dependent and independent variables represented by r and p value, while r is degree of correlation and p signifies significance level. It is evident from the table that teacher's teaching strategies does showed a significant positive linear relationship with students learning methods ( $r = 0.826$ ,  $p < 0.01$ ). The correlation values are positive, mean when teacher's teaching strategies increases students learning methods also increases. Hence there is a positive relationship between teacher's teaching strategies and students learning methods.

## 4.6 Teacher Assessment report

**Table 25: Descriptive statistics for Teacher assessment report**

Teacher Assessment report	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
	Mean±SD							
Present purposeful motivation to learners	5.00±0.00	1	4.20±0.84	3	2.80±0.45	8	1.00±0.00	7
Explains the lessons goals to students	5.00±0.00	1	5.00±0.00	1	3.20±1.10	7	1.60±0.55	5
Present appropriate and correct information equivalent to students' level.	5.00±0.00	1	5.00±0.00	1	4.40±0.89	3	2.60±0.55	4
Teacher works from organized/logical information	5.00±0.00	1	4.40±0.55	2	3.60±0.55	6	2.20±0.84	5
Students are motivated to concentrate and focus.	5.00±0.00	1	5.00±0.00	1	5.00±0.00	1	3.40±1.14	2
Teachers use a very good behavioral attitude/ treatment with students.	5.00±0.00	1	5.00±0.00	1	5.00±0.00	1	3.80±0.45	1
Good use of academic time in class.	5.00±0.00	1	5.00±0.00	1	4.00±0.71	4	1.60±0.89	5

Varies in assessment methods (verbal, written, performance)	5.00±0.00	1	4.20±0.45	3	3.80±0.45	5	1.40±0.55	6
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Teacher Assessment report	English language teachers	Ranking	Maths Teachers	Ranking	Science Teachers	Ranking	Social English Teachers	Ranking
	Mean±SD							
Provide immediate feedback to students	5.00±0.00	1	5.00±0.00	1	4.60±0.55	2	2.60±1.14	4
Follow up students' written work	5.00±0.00	1	4.40±0.55	2	3.20±0.45	7	2.80±0.45	3
Prepare material and sociological learning climate.	4.80±0.45	2	3.80±0.45	4	2.20±0.45	10	1.40±0.55	6
Students are encouraged to ask questions and self learning	4.80±0.45	2	3.40±0.55	5	2.60±0.55	9	1.00±0.00	7
Relate the lesson to current/local events, and environment	4.60±0.55	3	2.80±0.84	7	1.40±0.55	12	1.00±0.00	7
Teacher appropriately uses a variety of teaching aids.	4.60±0.55	3	3.00±0.00	6	1.20±0.45	13	1.00±0.00	7
Students are encouraged to discuss and share their thoughts	4.60±0.55	3	3.40±0.55	5	2.80±0.45	8	1.00±0.00	7
Apply the information into the real life	4.40±0.55	4	3.00±1.00	6	1.80±0.45	11	1.00±0.00	7

Students are encouraged for positive competition	4.40±0.55	4	2.40±0.55	8	1.60±0.55		1.00±0.00	7
Students are encouraged to reach to conclusions and explore possibilities	4.00±1.00	5	2.40±0.55	8	1.80±0.45	11	1.00±0.00	7
Train the students for self evaluation	3.00±1.23	6	1.60±0.55	9	1.00±0.00	14	1.00±0.00	7

Table 25 presents the ranking of Teacher Assessment report for different subject's teacher. Most of the statement ranked 1 for English language teachers. Similarly ranked 6 for Train the students for self evaluation.

**Table 26: Difference in the mean of teacher assessment factors between different subject teachers**

	Subject	N	Mean Rank
Preparation	English language Teachers	5	17.80
	Maths Teachers	5	13.10
	Science Teachers	5	8.10
	Social English Teachers	5	3.00
	Total	20	
Knowledge	English language Teachers	5	17.80
	Maths Teachers	5	12.80
	Science Teachers	5	8.10
	Social English Teachers	5	3.30
	Total	20	
Teaching/learning methods	English language Teachers	5	18.00
	Maths Teachers	5	13.00
	Science Teachers	5	7.60
	Social English Teachers	5	3.40
	Total	20	
Student's participation	English language Teachers	5	18.00
	Maths Teachers	5	12.10
	Science Teachers	5	8.90

	Social English Teachers	5	3.00
	Total	20	
Class Management	English language Teachers	5	15.00
	Maths Teachers	5	15.00
	Science Teachers	5	9.00
	Social English Teachers	5	3.00
	Total	20	
Assessment	English language Teachers	5	17.80
	Maths Teachers	5	13.00
	Science Teachers	5	8.20
	Social English Teachers	5	3.00
	Total	20	

<b>Test Statistics</b>						
	<b>Preparation</b>	<b>Knowledge</b>	<b>Teaching/learning methods</b>	<b>Student's participation</b>	<b>Class Management</b>	<b>Assessment</b>
Chi-Square	17.730	16.928	17.623	17.555	17.023	17.428
df	3	3	3	3	3	3
P-Value	<b>.000</b>	<b>.001</b>	<b>.001</b>	<b>.001</b>	<b>.001</b>	<b>.001</b>
a. Kruskal Wallis Test						
b. Grouping Variable: Subject						

Table 26 presents the mean of teacher's assessment factors between different subjects using non-parametric test. The P-value which is less than 0.05 for all the factors so reject the hypothesis and conclude that there is difference in the mean rank between different subjects. In teacher assessment factor, for preparation the mean rank is highest in English language subject while lowest mean rank in Social English subject. And for other factors the highest mean rank in English language subject and lowest mean rank in Social English subject.

## 4.7 Inspector points of view

**Table 27: Interview with school inspector to compare results**

<u><b>Inspector interview</b></u>		Date of interview:	05/06/2014
Al Najah Private School			
Mrs. Arthee			
1. Since how many years are you working as an inspector?			
6 YEARS			
2. How do you assess the teachers and monitor them?			
<ul style="list-style-type: none"><li>- Reviewing lesson plans</li><li>- Reviewing resources used</li><li>- Observing lessons over a period of time</li><li>- Teacher portfolio reviews</li></ul>			
3. From your observation, what is your overall perception about teachers teaching skills?			
<ul style="list-style-type: none"><li>- Many of the teachers are at a stage where they are now planning lessons daily</li><li>- Lessons have a 3 parts structure</li><li>- Teachers are beginning to use other resources in the classroom and not only relying on the textbook.</li><li>- Differentiation in the lesson is now being considered.</li><li>- There is a move to pupil-centered approach slowly.</li></ul>			
4. Does your school adopt critical thinking in teaching?			
<ul style="list-style-type: none"><li>- This is happening but we are at the beginning stages of this.</li><li>- It is becoming established in the IB curriculum subjects.</li></ul>			
5. What are your plans to improve teachers' performance in terms of adopting critical thinking strategy in the classes?			
<ul style="list-style-type: none"><li>- ADEC's vision for the 21<sup>st</sup> century schools incorporates critical thinking</li><li>- School's development plans and the 5 years strategic plan focus on critical thinking under improving the quality of teaching and learning.</li><li>- Subjects such as Math/Sciences are doing this but this should be across all subjects.</li><li>- Workshop sessions which focuses on critical thinking are planned as per 5 years strategic plan for the school.</li></ul>			

#### 4.8 Vice Principal points of view

**Table 288: Interview with school Vice Principal to get a clear answer regarding the study**

<b><u>Vice Principle interview</u></b>	Date of interview: <b>18/05/2014</b>
Al Najah Private School The School's Vice Principle	
Mr. Frank O'Rahilly <b>(5 years as a coordinator/first year as VP)</b>	
1. How do you assess your teachers?	
<b>You would have run some observations, peer observations and adding Arthee's report. I also take into consideration parents comments since their feedback about teachers is valuable.</b>	
2. Does your school adopt critical thinking in teaching? What is your strategy in applying it in your school?	
<b>Trying to answer that question, some teachers apply it while others are traditional. These teachers spend periods talking. Expert teachers develop creativity in the class, then kids do their own learning.</b>	
<b>There are steps, it's a long way to go, some real steps are taking places and others shall be taken.</b>	
<b>We need the expertise with people who are fostering critical thinking as it shall be fostered across all subjects.</b>	
3. Do you provide trainings for teachers on how to foster critical thinking?	
<b>No, honestly we do not.</b>	

## **CHAPTER V – DISCUSSION AND CONCLUSION**

### **5.1 Introduction**

The present section describes the discussion of the research results which were acquired in the antecedent section. To explain the findings of the research, the literature review is used in order to assess the critical thinking in education among the students and teachers in understanding the subjects from the perspective of both students and teachers belongs to private schools of Abu Dhabi UAE. The present section also describes the study conclusion by reviewing the research findings results for the three encircled research questions that were raised at the starting of this study. Eventually the present section also gives recommendations and limitations for further researches that can be done.

### **5.2 The role of critical thinking skills in schools**

The function of education is to educate the students think intensively in order to think critically. Perhaps education stops with efficiency which might prove the greatest threat to the society. Critical thinking is the process of determining the meaningfulness, accuracy, value of information and authenticity that raise the likelihood of reaching desired goals as recognized by the thinker. In the present study among surveyed students the distribution of the gender is equal and the participants includes the 12<sup>th</sup> grade students also.

In the present study the students (both school & university students) prefer 66% to participate in the discussion and have activities. Most of the times teachers encouraged the students to ask questions (47.3%). Students understand the lessons/textbook to write using your own words in their exams (48.7%). However in school level they memorize all the textbook contents, questions and answers for their exam (43.3%). However the study by Gellin (2003) concluded that college students who are actively participated in various activities like clubs for interacting their peers and faculty in inside the campus or organizations increased their measured critical thinking skills by 0.14 standard deviations as compared to college students who did not participate in such activities. In current study most of the student often shared their point of view (52%) with their teachers this is similar for both school and university students, but sometimes they shares (34.7%). Students ask their teachers to explain the point if they did not understand (74.5%), sometimes they ask their friends (19.3%). Silva (2008) pointed out the same argument keeping that thinking and knowledge have to be taught simultaneously.

The critical thinking is a lens that teaches the skills and content placed in the curriculum is argued by Case (2005). The findings of the present study revealed that among students English is the most favorite subject followed by Maths, Science and Social Science. Whereas when students ranked the

least favorite subject they ranked as follows Social Science, Maths, Science and English. Students frequently raise questions if they did not understand the lesson (60.0%). However the scenario is contradict among the school and university students. Thus the critical thinking among the students is enhanced the findings is in line with the previous studies. Pithers and Soden (2000) conducted the research and dismissed the perspective which critical thinking could be taught as a individual subject. .Relatively, critical thinking must be observed as a way of learning and teaching in any domain. Discussion forum as an instructional tool improved the teacher's critical thinking skill which in turn increases the critical thinking of students (Szabo & Schwartz, 2010).

The teachers were sometimes (52 %) encourage to participate in discussion and they train their students to get high grade in their exams (60.7%) rather enhancing their critical skill (25.3%). However the teachers depend on the students to understand think themselves and solve the problems by their own (62.0%). The schools prepare their students to study in university (57%). Majority of the school students ranked that their teachers uses discussing and facilitating (66%)strategy, whereas among university students they ranked that their teachers uses lecturing and talking as their teaching strategy (72%). Most of the students have given the good (58%) comments in relation to the teachers teaching strategy in private school.

### **5.3 Teaching methods employed by the teachers for improving critical thinking skills among students**

In the present study teachers critical thinking among the observed school revealed that majority of the teachers ranked that the Students respond to other students, Teacher works from organized information, presentation is logically organized, asks their students to justify and explain their thoughts and allows at least ten seconds wait time for students answer before restating the question and they asked their students to clarify and justify their response. However these responds were varied among the teachers of different gender. The teachers teaching activities have different effects on teacher's critical thinking dispositions (Evren *et al.*, 2012). Previous studies confirmed that there is a positive relationship between language proficiency and critical thinking ability. The language learning is improved by conducting the teaching critical thinking skills in EFL context (Fahim & Saeepour, 2011 ). In the previous studies showed that the critical thinking instructions affect the student's descriptive writing and their performance, in addition critical thinking also differs in relation to the gender (Gorjian *et al.*, 2012).

### **5.4 Teacher's strategy**

The teachers teaching strategy vary among different subjects. For instance teachers use short quizzes at the end of each lesson to recall information for English language, teachers prepare answers to the text book questions for Science, and however teachers expect that the answers should be from the

textbook using the same exact words for maths and Social English. The students regulate the learning aspects like emotions by the autonomy supportive teaching style (Zimmerman & Lebeau, 2003 ). The students are happier and attain successful in school days because of they are motivated to be autonomous which is recommended in more number of evidences. The autonomy degree is permitted on the basis of student's attitudes, age, personality and the stage (Wubbels *et al.*, 1991). In the present study the students learning method also varies among different subject. Students Listen only to teachers lectures and Lack of confidence and self esteem in English subject, in maths student focused only on the teachers lecture. In science the students focus on recall of isolated facts. Perhaps Students are bored and never ask questions for social science subject. When comparing the teacher's teaching strategies and students learning methods between different subjects there is no difference in the mean rank between different subjects.

### **5.5 What the teacher does**

English and maths teachers wrote the title on the white board. Social science teachers started to talk about the lesson for 30 minutes constantly in every lesson and asked the students to close their books to listen & pay attention. However Science teachers asked students to underline the important sentences in the text book. Students opened their text books and listen to the teachers during English class. In maths class students opened their text books, write notes on their notebook and listen. Students write notes on their notebook and listen during science class. However in social science class Students opened their text books. When comparing the teachers students attitude in class that there is no significant difference in the mean rank between different subjects. The findings were similar to that of the previous studies (Zhang, 2003; Jonassen, 2010) Critical thinking is a significant educational concept and it is essential for the students. Findings of this research reveal that training on the program of CoRT (cognitive research trust) can improve CTS among students who have difficulties in learning. A well-equipped classroom environment also plays a key role in the process of improving CTS among students (Melhem & Isa, 2013)

### **5.6 Teacher's teaching strategies and Students learning methods**

When comparing the teacher's teaching strategies and Students learning methods in schools teacher's teaching strategies does showed a significant positive linear relationship with students learning methods ( $r = 0.826$ ,  $p < 0.01$ ). The correlation values are positive, mean when teacher's teaching strategies increases students learning methods also increases. Hence there is a positive relationship between teacher's teaching strategies and students learning methods. The current research findings are in line with previous studies (Scott, 2009; Azar, 2010)

## 5.7 Teacher Assessment report

The teacher's preparation differs for different subjects. For instance English teacher first prefer to presents the purposeful motivation to learners, however the social science teachers prefer first to explain the lessons goal to students. Perhaps all subject teachers prefer to Explains the lessons goals to students. All subject teachers prefer to Present appropriate and correct information equivalent to students' level and works from organized/logical information. For all subjects Students are encouraged to discuss and share their thoughts and teachers use a very good behavioral attitude/ treatment with students and prefer to teachers provide immediate feedback to students. Teacher's teaching strategies increases students learning methods also increases. Similar findings was observed by Melhem and Isa (2013) where enhancement of critical thinking skills among students with learning difficulties was studied. Critical thinking is a significant educational concept and it is essential for the students. Yet in another study Azar (2010) analyze the impact of critical thinking dispositions on achievement of students and critical thinking is considered as one of the higher-order thinking skills, it cannot be predicted by the academic achievement itself. More adults are lacking the ability of fundamental reasoning skills is concluded by Van Gelder (2005) and Kennedy *et al.* (1991).

Teachers' critical thinker identifies and removes the contradictions in thinking, connect all the values and dimensions of thinking. Teacher as a critical thinker tries to ensure that understanding model is understandable to others (Haynes & Bailey, 2003). In the present study among all performance categories like Preparation, Knowledge, Teaching/ learning method, Class Management and assessment English language teachers was ranked highest than other subject teachers. There is significant difference in the mean rank between different subjects. In teacher assessment factor, for preparation the mean rank is highest in English language subject while lowest mean rank in Social English subject. And for other factors the highest mean rank in English language subject and lowest mean rank in Social English subject. In a similar study conducted by Jonassen (2010) stated that the teachers transfer the approach from learning to thinking must choose both informal and formal assessment tasks, thus the students implement the processes of problem-solving and other critical thinking dimensions

## 5.8 Limitations

The present study sample size is limited.. Therefore, further studies must focus on applying large sample size to derive a holistic view. If the collected information supposed to be a lot of errors may occur because of the questionnaire is self-administered. The current study research methodology adopt the descriptive cross- sectional quantitative process applying survey method to determine critical thinking of the teachers teaching strategy and students learning behavior. Even though this cross-sectional study supports in collecting great number of people it restricts the effect and cause relationship.

Therefore the upcoming studies must concentrate on the longitudinal study design which supports to understand the impact and its factors with the course of time. The present research has focused on only little factors. Though, various other factors that supports to attain a entrepreneurial fulfilment sense. Thus, future studies may concentrate on further contributing factors which result in critical thinking as the main objective in education.

## **5.9 Conclusion**

Uncritical thinkers cannot be able to solve the problems properly, take rash conclusions and so on. Educational institutions in Abu Dhabi attempts to foster critical thinking skills as the main goal in education. Thus current research focused to analyze importance of critical thinking skills among students. Teaching critical thinking to students would help to differentiate various views and ideas and characterize the process. Different subject teachers use different methods of teaching for students depending upon the subject. The findings of the present study revealed that the critical thinking is necessary among the school students.

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Appendix 1

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS ONE OF  
THE MAIN OBJECTIVES OF EDUCATION**

**Student's questionnaire**

ID NUMBER: (Grade-Section-#)  
(Grade-Section-#)

Date of questionnaire: /05/2014

*Introduction: This survey is conducted to identify the critical thinking as one of the main objectives of education*

**SECTION –I: Students Information**

1.	This part is general information about you. <input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age (years) _____
3	School's Name: Al Najah Private School

1. Which teaching strategy do you prefer?

- The teacher to lecture while you are just listening  
 To participate in discussion and have activities

2. Does the teacher encourage you to ask questions?

- Yes  No  Sometimes

3. How do you study for the exams?

- Memorize all the textbook contents, questions and answers  
 Understand the lessons/textbook to write using your own words  
 Other

4. Do you share your points of view with your teacher?

- Yes  No  Sometimes

5. If you have a problem to understand a point in the lesson, would you?

- Ask the teachers questions to explain it for you  
 Memorize it as it is  
 Ask your friend/someone later to explain it for you  
 Other

6. What is your favorite lesson? Math English Sciences Social Studies

7. Which lesson do you like the least? Math English Sciences Social

8. Do you frequently ask questions about something you did not understand in the lesson?

- Yes  No

9. Do your teachers encourage you to participate in discussions?

-

Yes      No      Sometimes

10. Did your teacher(s) ask you to study for the exam(s)?

- To get high grades
- To enhance your critical thinking skills
- Other

11. The teachers depend that you will

- Memorize and recall information
- Understand, think for yourself and solve problems by your own
- Other

12. Does school prepare you to study in the university?

- Yes       No       Sort of

13. Your teachers use the following teaching strategy

- Lecturing and talking
- Discussing and facilitating
- Others

14. What are your comments regarding teaching strategies in Private Schools and what are your

Suggestions for further improvement

- Good
- Not Good
- No comment

Appendix 2

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS ONE OF  
THE MAIN OBJECTIVES OF EDUCATION**

**SECTION V: Teacher Assessment Report**

*The following section refers to your level of quality*

*5= Excellent; 4= Very good; 3=Good; 2=Fair; 1=Poor*

Performance categories	Performance level				
<b>1.Preparation:</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1. Prepare material and sociological learning Climate.					
2.Present purposeful motivation to learners					
3.Explains the lessons goals to students					
<b>2.Knowledge</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1. Present appropriate and correct information equivalent to students' level.					
2.Relate the lesson to current/local events, and environment					
3.Apply the information into the real life					
<b>3.Teaching/learning methods</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1.Teacher works from organized/logical information					
2. Teacher appropriately uses a variety of teaching aids.					
<b>4. Students' Participation:</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1.Students are encouraged to discuss and share their thoughts					
2.Students are encouraged to reach to conclusions and explore possibilities					
3.Students are encouraged to ask questions and self learning					
4.Students are encouraged for positive competition					
<b>5.Class Management</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1. Students are motivated to concentrate and focus.					
2.Teachers use a very good behavioral attitude/ treatment with students.					
3. Good use of academic time in class.					
<b>6. Assessment</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Fair</b>	<b>Poor</b>
1.Varies in assessment methods (verbal, written, performance)					
2.Train the students for self evaluation					
3.Provide immediate feedback to					

students					
4.Follow up students' written work					

Appendix 3

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS ONE OF  
THE MAIN OBJECTIVES OF EDUCATION**

**Teacher's questionnaire**

**Section II: Teachers critical thinking in the observed school**

Slno	Teachers critical thinking in the observed school	Yes	No
1.	Students work in pairs or small groups.	<input type="checkbox"/>	<input type="checkbox"/>
2.	Students respond to other students.	<input type="checkbox"/>	<input type="checkbox"/>
3.	Students help others to analyze and solve problems.	<input type="checkbox"/>	<input type="checkbox"/>
4.	Teacher accepts all valid students' responses.	<input type="checkbox"/>	<input type="checkbox"/>
5.	Incorrect students respond elicit encouraging, supportive comments.	<input type="checkbox"/>	<input type="checkbox"/>
6.	Teacher works from organized information.	<input type="checkbox"/>	<input type="checkbox"/>
7.	Students take note systematically.	<input type="checkbox"/>	<input type="checkbox"/>
8.	Teacher's presentation is logically organized.	<input type="checkbox"/>	<input type="checkbox"/>
9.	Ideas are graphically symbolized during instruction.	<input type="checkbox"/>	<input type="checkbox"/>
10.	Teacher acts as facilitator.	<input type="checkbox"/>	<input type="checkbox"/>
11.	Teacher probes for correct response	<input type="checkbox"/>	<input type="checkbox"/>
12.	Teacher seeks evidence for stated claims	<input type="checkbox"/>	<input type="checkbox"/>
13.	Teacher frequently asks, "Why do you think so?"	<input type="checkbox"/>	<input type="checkbox"/>
14.	Students relate learning to past experience or similar situations	<input type="checkbox"/>	<input type="checkbox"/>
15.	Teacher allows time to consider alternative/point of view.	<input type="checkbox"/>	<input type="checkbox"/>
16.	More than one student is queried for point of view/solution.	<input type="checkbox"/>	<input type="checkbox"/>
17.	Teacher asks students to justify and explain their thoughts.	<input type="checkbox"/>	<input type="checkbox"/>
18.	Teacher asks open ended questions with multiple answers.	<input type="checkbox"/>	<input type="checkbox"/>
19.	Provides visual cues for developing cognitive strategies	<input type="checkbox"/>	<input type="checkbox"/>
20.	Teacher appropriately uses a Variety of visual media (charts, chalkboard, maps, pictures, gestures).	<input type="checkbox"/>	<input type="checkbox"/>
21.	Teacher poses "what if" suppose that" questions	<input type="checkbox"/>	<input type="checkbox"/>

22.	Encourages transfer of cognitive skills to everyday life	<input type="checkbox"/>	<input type="checkbox"/>
23.	Teacher encourages transfer at end of lesson with Comments like, “this will help you in your everyday Life in this way...”	<input type="checkbox"/>	<input type="checkbox"/>
24.	Teacher allows at least ten seconds wait time for students answer before restating the question.	<input type="checkbox"/>	<input type="checkbox"/>
25.	Teacher asks students to clarify and justify their response.	<input type="checkbox"/>	<input type="checkbox"/>
26.	Teacher reinforces students for responding to open ended questions	<input type="checkbox"/>	<input type="checkbox"/>
27.	Encourages students to ask question	<input type="checkbox"/>	<input type="checkbox"/>
28.	Teacher poses problematic situation	<input type="checkbox"/>	<input type="checkbox"/>
29.	Teacher withholds correct responses; encourages students to explore possibilities	<input type="checkbox"/>	<input type="checkbox"/>
30.	Teacher encourages students to answer other student’s questions.	<input type="checkbox"/>	<input type="checkbox"/>

1.	This part is general information about you. <input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age (years) _____
3	School’s Name: Al Najah Private School

Appendix 4

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS ONE OF  
THE MAIN OBJECTIVES OF EDUCATION**

**Observation Report**

**Section IV: Teacher’s teaching strategies and students learning methods**

*The following section refers to your frequency of use*

*5=Always; 4= Often; 3= Sometimes; 2= Rarely; 1=Never*

	<b>What the teacher does:</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>often</b>	<b>Always</b>
1	Teacher wrote the title on the white board					
2	She/he started to talk about the lesson for 30 minutes constantly in every lesson.					
3	Teacher asked students to pay attention because she would give them a quiz at the end.					
4	After she/he finished lecturing about the lesson, she/he started to ask questions about it, (to retrieve the information).					
5	Teacher shouted at students and said: “Why don’t you focus and listen carefully, how will you answer in the exam”.					
6	Teacher asked students to underline the important sentences in the text book.					
7	Teacher used a diagram/chart/map/picture to explain the lesson.					
8	Teacher asked the students to pay attention to the lesson then she/he said: “I will bring a question from this lesson in the exam”.					
9	At the end of each lesson, the teacher gave them short quizzes about the lessons.					
10	She/he collected quizzes and said: “I will grade them later”.					
11	She/he asked the students to close their books to listen & pay attention.					
	<b>What students do</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>often</b>	<b>Always</b>
1	Students opened their text books					
2	Students listen to the teacher					

3	Students are looking around and drawing in their text books.					
4	Only few students (sometimes 2) raise their hands to answer.					
5	Students remain silent					
6	Students start to underline the sentences using coloring pens, and most of them were looking at each other's book to do the same.					
7	Students are discussing and listening to each others					
8	Students write notes on their notebook and listen.					
9	Students start answering and asking each other when a work is assigned.					
10	Students check the answers with their peers.					
11	Students close textbooks and listen					

Appendix 5

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS ONE OF  
THE MAIN OBJECTIVES OF EDUCATION**

**Observation Checklist**

**Section III: Teacher’s teaching strategies and students learning methods**

*The following section refers to your frequency of use*

*5=Always; 4= Often; 3= Sometimes; 2= Rarely; 1=Never*

<b>Sno</b>	<b>Teachers Strategy</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>often</b>	<b>Always</b>
1	Rote memorization					
2	Underline the information in the text book.					
3	Answers should be from the textbook using the same exact words.					
4	Teachers shout at students and use discouraging words such as: not focusing, getting low grades, not remembering, not listening etc.					
5	The teachers prepare answers to the textbook questions.					
6	The teachers read from the textbooks to explain the lesson.					
7	Great emphasize on grades and tests (performance rather than effort).					
8	The teachers use short quizzes at the end of each lesson to recall information					

### Section III: Teacher's teaching strategies and students learning methods

The following section refers to your frequency of use

5=Always; 4= Often; 3= Sometimes; 2= Rarely; 1=Never

	<b>Students learning methods</b>	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>often</b>	<b>Always</b>
1	Students used model answers to exercises and textbook questions.					
2	Listen only to teachers lectures.					
3	Students focus on recall of isolated facts.					
4	Lack of confidence and self esteem.					
5	Students do not get a chance to talk in the classroom and express their thoughts.					
6	Student are bored .and never ask questions.					
7	Students do not get a chance to talk in the classroom and express their thoughts.					
8	Students perform only for grades.					
9	Students are afraid to ask questions about the lessons					

Appendix 6

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS  
ONE OF THE MAIN OBJECTIVES OF EDUCATION**

**Grade 12 Graduate/University student's questionnaire**

Date of questionnaire:        /05/2014

*Introduction: This survey is conducted to identify the critical thinking as one of the main objectives of education*

**SECTION VI: Graduate's points of view**

*Introduction: This survey is conducted to identify the critical thinking as one of the main objectives of education*

**Information**

1.	This part is general information about you. <input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age (years) ____ _____
3	School's Name: Al Najah Private School Graduate of Academic year 2014-2015

1. Which teaching strategy did you prefer?  
 The teacher to lecture and you to listen  
 To participate in discussion and have activities
  
2. Did teachers encourage you to ask questions?  
 Yes             No             Sometimes
  
3. How did you study for the exams?  
 Memorize all the textbook contents, questions and answers  
 Understand the lessons/textbook and write using my own words  
 Other
  
4. Did you share your points of view with your teachers?  
 Yes     No     Sometimes
  
5. If you had a problem to understand a point in the lesson, would you?  
 Ask the teachers questions to explain it for you  
 Memorize it as it is  
 Ask your friend/someone later to explain it for you  
 Other
  
6. What was your favorite lesson?  Math     English     Sciences     Social Studies
  
7. Which lesson you like the least?  Math     English     Sciences     Social Studies

8. Did you frequently ask questions about something you did not understand in the lesson?

Yes       No

9. Do your teachers encourage you to ask questions and participate in discussions?

Yes       No       Sometimes

10. Did your teacher(s) ask you to study for the exam(s)?

- To get high grades
- To enhance your critical thinking skills
- Other

11. The teachers depend that you will

- Memorize and recall information
- Understand, think for yourself and solve problems by your own
- Other

12. Does school prepare you to study in the university?

Yes       No       Sort of

13. Your teachers use the following teaching strategy

- Lecturing and talking
- Discussing and facilitating
- Others

14. What are your comments regarding teaching strategies in Private Schools and what are your suggestions for further improvement



4. Does your school adopt critical thinking in teaching?

5. What are your plans to improve teachers' performance in terms of adopting critical thinking strategy in the classes?

Appendix 8

**DO PRIVATE SCHOOLS IN ABU DHABI UAE FOSTER CRITICAL THINKING AS  
ONE OF THE MAIN OBJECTIVES OF EDUCATION**

**Vice Principle interview**

Date of interview: /05/2014

Al Najah Private School  
The School's Vice Principle

1. How do you assess your teachers?

2. Does your school adopt critical thinking in teaching? What is your strategy in applying it in your school?

3. Do you provide trainings for teachers on how to foster critical thinking?

